

## P.Way Manual

### Objective Type

- 1 ) In Points & Crossings , switch angle is the angle subtended between gauge face of the \_\_\_\_ rails
  - a) Tongue & Check
  - b) Points & Wings
  - c) Stock & Tongue
  - d) Points & Splice
- 2 ) Resistance due to friction offered by track when a train move ?
  - a) 0.0016W
  - b) 0.00008W
  - c) 0.004W
  - d) 0.0010W
- 3 ) Vertical curves are provided at the junction of the grade where algebraic difference between grade is
  - a) =0.4%
  - b) =0.5%
  - c) =0.1%
  - d) = 0.3%
- 4 ) Vertical curve is normally designed as ?
  - a) Cubic parabola
  - b) Parabola
  - c) Circular
  - d) Elliptical
- 5 ) When change of gradient is +ve it forms
  - a) Sag
  - b) Summit
  - c) Transaction curve
  - d) Circular curve
- 6 ) When change of gradient is -Ve it forms?
  - a) Sag
  - b) Summit curve
  - c) Transaction curve
  - d) Circular
- 7 ) Normal speed can be restored incase of MANUAL deep screening after \_\_\_\_ days?
  - a) 20
  - b) 21
  - c) 16
  - d) 10
- 8 ) 75kmph speed can be raised in deep screened track with machine packing after \_\_\_\_ day
  - a) 4th
  - b) 6th
  - c) 7th
  - d) 9th
- 9 ) Chemical and metallurgical testing is mandatory if rail fails after renewal within \_\_\_\_ years
  - a) 10
  - b) 6
  - c) 5
  - d) 2
- 10 ) Recommended minimum depth of Ballast cushion in SWR is \_\_\_\_ mm?
  - a) 150
  - b) 200
  - c) 250
  - d) 300
- 11 ) Wherever 22T axle load rolling stock running, min. depth of clean ballast cushion should be \_\_\_\_ mm
  - a) 250
  - b) 300
  - c) 350
  - d) 400
- 12 ) Width of ballast section in LWR for single line in straight track is \_\_\_\_ m.
  - a) 4.2
  - b) 4.5
  - c) 4.72
  - d) 4.87

- 13 ) Side slope of formation in embankment should be kept normally?  
a) 2:1                      b) 1:1                      c) 1:2                      d) 1½:1
- 14 ) Staggered rail joints are normally provided where degree of curvature is \_\_\_\_\_ and above  
a) 4                      b) 5                      c) 3                      d) 6½
- 15 ) ECW work is to be carried out to make LWR when minimum residual life of rails is \_\_\_\_\_ years ?  
a) 5                      b) 8                      c) 10                      d) 15
- 16 ) Accidents due to weld failure can be reduced by?  
a) Improved quality of weld  
b) Minimizing welding joints  
c) USFD and joggling of weld  
d) All of the above
- 17 ) Resultant radius of turn out laid in similar flexure?  
a)  $R_e = (R_m \times R_s) / R_m \times R_s$   
b)  $(R_m \times R_s) / R_m - R_s$   
c)  $(R_m + R_s) / R_m \times R_s$   
d)  $(R_m - R_s) / R_m \times R_s$
- 18 ) Satisfactory ride index for a long distance express train is ?  
a) 2.5                      b) 3                      c) 3.5                      d) 4
- 19 ) Minimum throw of switch used in thick web switch is \_\_\_\_\_ mm?  
a) 95                      b) 110                      c) 115                      d) 140
- 20 ) Function of super elevation in curves is ?  
a) to distribute of load an both rails  
b) to reduce wear and tear of rolling stocks  
c) to provide comfort to passenger  
d) all of the above
- 21 ) Cant excess occur when train travel on curve at  
a) higher speed than equilibrium speed  
b) on lower speed than equilibrium speed  
c) equilibrium speed  
d) maximum sectional speed.
- 22 ) Rumble strips are to be provided at \_\_\_\_\_ m length from gate post in hily terrain or flat terrain ?  
a) 20                      b) 30                      c) 40                      d) 60
- 23 ) In 'C' class ODC gross clearance from standard moving dimension is \_\_\_\_\_ mm  
a) >225                      b) >150                      c) >75                      d) <75

- 24 ) Desirable gauge on curve having radius less than 350m is
  - a) -6 to +6
  - b) -6 to +10
  - c) -6 to +15
  - d) -6 to +20
- 25 ) CRS sanction is mandatory where track lifting involved is more than \_\_\_\_ mm.
  - a) 300
  - b) 400
  - c) 500
  - d) 1000
- 26 ) Switch Entry angle of 1:12 T/out is?
  - a) 0° 20'0"
  - b) 0° 20' 27"
  - c) 0° 27'20"
  - d) 0° 20'37"
- 27 ) Acceleration peaks exceeding \_\_\_\_\_ g is taken for track quality assement on high speed routes above 110 Km/h on "A" & "B" routes of BG
  - a) 0.2
  - b) 0.15
  - c) 0.35
  - d) 0.3
- 28 ) Which index is based on SD values for track monitoring
  - a) CTR
  - b) A, B, C Categorization
  - c) TGI
  - d) None of the above
- 29 ) Track is classified as "Very Good" if total No. of vertical and lateral acceleration peaks per Km on high speed routes is
  - a) > 1.0
  - b) < 1.0
  - c) < 1.5
  - d) < 0.5
- 30 ) Need for urgent maintenance of track, arises when the value of individual indices of different parameters of TGI is
  - a) 100
  - b) 36
  - c) 50
  - d) 80
- 31 ) Which tolerance has not been prescribed on Indian Railways for track?
  - a) Safety
  - b) Service
  - c) New Track
  - d) maintenance
- 32 ) The frequency of track recording car for group "A" & "B" routes is once in \_\_\_\_ months
  - a) 3
  - b) 4
  - c) 6
  - d) 2
- 33 ) The suffix with track geometry A, B, C etc., pertains to \_ limit.
  - a) "A"
  - b) "B"
  - c) "C"
  - d) "D"
- 34 ) The weightage of alignment index in the TGI based track recording is \_\_\_\_ times
  - a) two
  - b) six
  - c) four
  - d) three
- 35 ) In TRC reports, the No. of worst peak locations for each parameter both long and short chords are
  - a) 10
  - b) 15
  - c) 8
  - d) 6

- 36 ) Frequency of Census at a Level Crossing where TVU is between 75,000 to 1 lakh will be \_\_\_\_\_ Years  
 a) 2      b) 2½      c) 3      d) 5
- 37 ) Recommended Throw of Switch in BG is \_\_\_\_\_ mm  
 a) 95      b) 105      c) 110      d) 115
- 38 ) The versine Versions of Turn-in Curves on Loops should be recorded at stations at 3 Mtrs interval on 6 Mtrs Chord length. The variation in Versions on two successive ie stations should not be more than \_\_\_\_\_mm  
 a) 2      b) 4      c) 6      d) 8
- 39 ) Actual wear for Wing rail of 60 Kg CMS Crossing is equal to  
 a) measured wear - 2.5mm  
 b) measured wear -2 mm  
 c) measured wear -3mm  
 d) measured wear-1.5mm
- 40 ) Spring setting device is used in PSC turnouts for  
 a) increasing the throw of switch and for better housing of Tongue Rail  
 b) increasing the gap at JOH and for better housing of Toungue rail  
 c) minimising the in-built twist in the switch portion  
 d) both a & b
- 41 ) Junction of heads in a switch is a place where  
 a) TR & SR are at same level  
 b) TR & SR have same head width  
 c) TR is 6mm higher than SR      d)None of the above
- 42 ) The maximum wear on crossing permitted is \_\_\_\_\_ mm on Rajdhani and \_\_\_\_\_ mm on other routes.  
 a)4 & 6      b)6 & 10      c)10 & 20      d)15& 20
- 43 ) 60 Kg, 1 in 12 PSC Fan-shaped layout has a speed potential of max \_\_\_\_\_ Kmph in facing direction, while negotiating T/O.  
 a) 45      b) 75      c) 30      d) 50
- 44 ) The present day concrete sleeper Turn-outs are called Fan-shaped layout due to laying of sleepers  
 a) Perpendicular to the straight track in switch portion  
 b) Perpendicular to bisecting line of crossing in the crossing por tion  
 c) Perpendicular inclined at ½ angle between the normal to straight and curved track in lead portion  
 d) None of the above

- 45 ) Guard rail is provided on bridges to ?  
 a) support the running rail  
 b) support the bridge  
 c) prevent serious damages in case of derailment  
 d) support the sleeper
- 46 ) The sections which are normally to be patrolled during monsoon will be identified and notified by the  
 a) Sectional JE(P)                      b) Incharge SE(P)  
 c) ADEN                                      d) DEN
- 47 ) During deep screening, it should be ensured when ballast is being removed from any sleeper, invariably, there are atleast \_\_\_\_\_ nos fully supported sleepers between it and the next sleeper  
 a) 2              b) 4              c) 5              d) 6
- 48 ) The JE(P.way) (not in over all Incharge) should check the equipment of all patrolmen and watchmen once in a \_\_\_\_\_  
 a) Week    b) Fortnight    c) Month    d) daily
- 49 ) Patrolling in pairs can be introduced with the approval of  
 a) PWI    b) DEN    c) AEN    d) CE
- 50 ) The safety radius at the time of testing of Detonators is \_\_\_\_ M  
 a) 30              b) 45              c) 50              d) 60
- 51 ) Over hang beyond the last lifting/slinging point while lifting 90 UTS rails should not exceed \_\_\_\_M  
 a) 6              b) 3              c) 3.25              d) 5.5
- 52 ) The PWI-incharge should check patrolling at nights by train once in a \_\_\_\_\_  
 a) Week    b) Fortnight    c) Month    d) daily
- 53 ) Flat tyre causes maximum damage at a speed of \_\_\_\_\_ Kmph  
 a) 90 -100              b) 25 - 30    c) 10-15    d) 50-60
- 54 ) The standard play on BG track is \_\_\_\_ mm  
 a) 25              b) 19              c) 20              d) 22
- 55 ) The heel of ER clip is  
 a) the edges of ER Clip    b) which rests on insert shoulder    c) the part which is inside the insert  
 d) which rests on rail flange
- 56 ) The Toe of ER Clip is  
 a) the edges of ER Clip  
 b) which rests on insert shoulder  
 c) the part which is inside the insert  
 d) which rests on rail flange

- 57 ) For checking correct curvature of tongue rail, ordinates should be measured
- at every 3 Mtr
  - at mid-point of tongue rail
  - at mid-point & qtr points of tongue rail
  - None of the above
- 58 ) In case of Fan-shaped layout same sleepers can be used for a RH & LH turnout, for this purpose
- RH end of the sleepers should remain on RH side
  - RH end of sleepers should be brought towards LH side by rotating sleepers
  - Sleepers in the switch should remain as it is but, those in the lead should be rotated to bring the end to LH side
  - None of the above
- 59 ) Behind the heel of switch, spherical washers should be fitted
- On left hand side
  - On right hand side
  - Towards inclined surface
  - None of the above
- 60 ) Chord length for measuring lead curvature of a turnout is \_\_\_\_M
- 3
  - 4
  - 6
  - 10
- 61 ) Dia. of drill bit for hole in a Gap less joint should be \_\_\_\_mm
- 26
  - 26.5
  - 27
  - 30
- 62 ) Maximum permissible wear on crossing & wing rail is \_\_\_\_mm
- 10
  - 8
  - 6
  - 12
- 63 ) As per IRCA rules, the rejection limit for wheel flange thickness is \_\_\_\_mm
- 38
  - 25.4
  - 19
  - 16
- 64 ) CASNUB bogies are fitted in \_\_\_\_ Type of wagons.
- BOX N
  - BOX
  - 4 wheeler
  - BCX
- 65 ) A false flange may split open points while traveling in
- leading direction
  - trailing direction
  - both direction
  - None of the above
- 66 ) The 60 Kg 90 UTS rail shall be planned for renewal after passage of minimum traffic of \_\_\_\_ GMT
- 525
  - 550
  - 600
  - 800
- 67 ) Half yearly report on the condition of Permanent way shall be submitted by
- PWI
  - AEN
  - DEN
  - CE
- 68 ) The top table of Guard rail should not be lower than that of the running rail by more than \_\_\_\_mm
- 10
  - 25
  - 50
  - 35
- 69 ) The ballast underside of Glued insulated joints must not be less than \_\_\_\_\_mm
- 35
  - 25
  - 45
  - 50

- 70 ) TFR proposal is initiated if 20% or more sample size record toe load below \_\_\_\_kg  
a) 400 b) 500 c) 600 d) 800
- 71 ) Sleeper to sleeper gauge variation limit is \_\_\_\_mm  
a) 4 b) 5 c) 2 d) 3
- 72 ) Desirable clearance between top of stretcher bar and bottom of stock rail is \_\_\_\_ mm.  
a) 1 to 2.5 b) 1.5 to 2.5 c) 1 to 3.5 d) 1.5 to 3
- 73 ) The maximum number of Rail dollies permitted to work in group in one block section are \_\_\_\_ Nos.  
a) 5 b) 6 c) 8 d) 10
- 74 ) In 1 in 12 Fan-shaped Layout the serial number of sleepers in lead portion is  
a) 20 to 62 b) 21 to 64  
c) 22 to 62 d) 20 to 64
- 75 ) Which of the following statement is not correct in connection with PSC Fan shaped layout  
a) No. of Stretcher bars in Switch are increased from 3 to 4.  
b) Lengths of tongue rails, Stock rails and crossing are increased.  
c) Distance between SRJ and ATS is same as the conventional layout for 52kg, 1 in 12 layout.  
d) Sleepers are not square to the main line track in lead and crossing portion.
- 76 ) Which of the following versines require correction in a Group B, BG line, for a curve with 3° curvature (Ideal versine is 87 mm on 20m chord) with maximum permitted speed of 105 kmph.  
a) 55,40,60,72,85 b) 87,70,50,68,50  
c) 68,84,70,55,60 d) 85,87,62,78,82
- 77 ) Ideal versine measured on 3m chord on turn out curve in lead portion is \_\_\_\_mm  
a) 20 b) 87 c) 10 d) 116
- 78 ) Which of the following machine crushed ballast stack gets rejected for under size (retention % on sieves given)  
a) 40mm,20mm-35%,99% b) 40mm,20mm-50%,96% c) Both a & b  
d) None of the above
- 79 ) No. of ballast samples of 0.027 Cum. required for sieve analysis for two stacks of quantity 80 Cum, 520 Cum are  
a) 6 b) 8 c) 7 d) 10
- 80 ) With reference to the formula  $C = \frac{GV^2}{127R}$  used for calculation of equilibrium cant, which of the following statements are false.  
i. C- equilibrium cant in mm ii. G -Track gauge in mm  
iii. V- Speed in Kmph. iv. R- Radius of curve in mm  
a) None of the above b) Only (iii)  
c) Both (i) & (ii) d) Only (ii)

- 81 ) In following junction of grades, which case requires provision of a vertical curve in a Group B line?
- a) 1 in 200 R, 1 in 200F      b) Level, 1 in 200R  
c) Both a & b                      d) None of the above
- 82 ) Which of the following statement is true with reference to life of detonators
- a) Normal life of detonators is 7 Yrs  
b) Life of detonators can be extended to ten years on yearly basis after satisfactory testing of 2 no.s from each lot      c) Safety range of detonator is beyond a radius of 50m      d) All the above
- 83 ) Correct sequence of operations in conventional through packing is      a)
- a) Squaring, gauging , slewing, packing  
b) Gauging, Squaring, Slewing , Packing  
c) Squaring, Slewing, gauging ,packing  
d) None of the above
- 84 ) The Maximum gradient in station yards should be \_\_\_\_\_ unless special safety devices are adopted and/or special rules enforced.
- a) 1 in 400      b) 1 in 260      c) 1 in 1000      d) 1 in 1200
- 85 ) Approximate Quantity of ballast required for 1 m length of track standard ballast profile for LWR track (Single line BG) with a clean cushion of 250 mm
- a) 3 Cum      b) 4 Cum      c) 2 Cum      d) 5 Cum
- 86 ) Which of the following statements is correct with reference to Guard Rail arrangement in Bridge approaches
- a) Clearance between Guard Rail and running rail is  $250 \pm 50$  mm  
b) Length of Guard rail beyond face of the ballast wall is 4875 mm for BG  
c) Only (a)      d) Both (a) & (b)
- 87 ) Minimum size of bridge timber to be used in BG (b x d x l), d-exclusive of notching
- a) 150 X 250 X 2440 mm      b) 125 X 250 X 2745 mm      c) 175 X 300 X 3050 mm  
d) 150 X 250 X 2745 mm
- 88 ) Which of the following statements is correct with reference to hook bolts on a bridge
- a) Diameter of hook bolt is 25mm  
b) Straight lipped hook bolts are used for R.S.J bridges  
c) Sloping lip hook bolts are used for plate girder bridges      d) None of the above
- 89 ) Which of rail wear combinations (Vertical and Lateral) require planning for renewal, in Group B, 60 kg track (in curves)
- a) 10mm & 7mm      b) 6mm & 7MM  
c) 9mm & 9MM      d) 11mm & 7MM

- 90 ) Renewal consideration of service life in terms of total GMT for 52 kg rail is  
a) 600 b) 625 c) 800 d) 525
- 91 ) In the case of single Rails, initial laying gap recommended for free rails at FP joints at 40° C to 55° C 'Rail temperature is \_\_\_\_mm  
a) 8 b) 1 c) 4 d) 7
- 92 ) In calculation of TGI, multiplication factors involved for unevenness index (UI), Twist index (TI), Gauge index (GI) and alignment index (AI) respectively are  
a) 1,1,1, AND 6 b) 2,1,1 AND 6  
c) 2,2,2 AND 6 d) 1,1,2 and 6
- 93 ) In a similar flexure layout where 1 in 12 turn out takes off from a 3° Curve the effective degree of T/O becomes approximately  
a) 5° b) 6° c) 7° d) 8°
- 94 ) In which of the following cases of toe load measurement TFR shall be proposed (Sample size %).  
a) 15% records less than 400kg  
b) 30% records less than 400kg  
c) 25% records less than 400kg d) Both b and c
- 95 ) Heel divergence in a fixed heel type switch is  
a) Distance between gauge faces of tongue rails and stock rail at tongue rail joint  
b) Distance between gauge faces of tongue rail and stock rail at the first block connecting tongue rail and stock rail from ATS  
c) Clear distance between tongue rail and stock rail at the first block connecting tongue rail & stock rail from ATS  
d) None of the above
- 96 ) In a loose heel type of switch, the following is required at the tongue rail & lead rail joint  
a) Fishplate opposite to heel block on tongue rail side has to be bent adequately  
b) Two bolts towards tongue rail shall only be hand tightened c) Fish fit type of heel block to be used  
d) All the above
- 97 ) Slide chair bolt holes in stock rail of switch are \_\_\_\_\_  
a) Same as normal fish bolt hole height  
b) 6mm below fish bolt hole  
c) 6mm above fish bolt hole  
d) 8mm below fish bolt hole
- 98 ) In a thick web switch, which of the following statement is correct  
a) Thickness of tongue rail increased at ATS to 42 mm, and height is reduced to 134mm.  
b) Tongue rail attains , normal section at the rear to connect with normal fish plates  
c) Counterfort arrangement provided to stock rail for withstanding lateral thrust, and maximum speed permitted on T/O is 50 kmph  
d) All the above.

- 99 ) Which of the following works require caution order
- Shallow screening
  - Through packing
  - Oiling and greasing of fish plated joints
  - None of the above
- 100 ) 1 in 20 inward cant of rail shall not be provided at
- Major girder bridge proper
  - Points and crossings
  - Both (a) & (b)
  - None of the above
- 101 ) Check rail clearance range required is not from 44 to 48 mm in BG for check rails at
- Points and crossings
  - Level crossings
  - Sharp curves
  - Both (b) & (c)
- 102 ) Which of the following statements are correct in connection with protection of track in case of automatic block system, in BG
- If train or part of train is obstruction one detonator to be placed at 90m away from obstruction, and two more (10m apart) detonators to be placed at 180m with hand danger signal
  - In case of obstruction other than train track has to be protected at 600m distance with one detonator, and with three detonators and hand danger signal at 1200m
  - Both (a) & (b) are correct
  - None of the above
- 103 ) Action to be taken on observing parting of a train by a Gate keeper in a LC gate
- Show hand danger signal to driver of the train
  - Put the Gate stop signal to ON if possible
  - Shout and gesticulate to attract attention of guard and driver
  - All the above
- 104 ) Periodical censuses at a level crossing shall be taken
- Once in five years normally to review classification of Gate
  - For TVU 75000 to 100000 once in 2½ Yrs to determine their eligibility /priority for replacement with ROB/RUB
  - For all LCs once in three years
  - For all LCs once in two years
- 105 ) Which of the following need not to be a gapless fish plated joint
- Joints on a Bridge
  - Stock rail tongue and lead rail joints
  - Joints at toe and heel of crossing
  - Combination Joints
- 106 ) In chemical composition of 90 UTS rails proportions of Carbon, Manganese, and Silicon in decreasing order is
- Mn, C, Si
  - Mn, Si, C
  - Si, C, Mn
  - C, Si, Mn
- 107 ) PWI In charge and his assistant should carry out the inspection of points & Crossings in passenger running lines once in \_\_\_\_\_ months by rotation.
- 3
  - 4
  - 6

- 108 ) Oiling and greasing of SEJs shall be done by Key man once in \_\_\_\_\_  
a) Fortnight b) month c) 3 months
- 109 ) Maximum distance between two trolley refuses on a ballasted deck bridge is \_\_\_\_\_ M  
a) 50 b) 100 c) 60
- 110 ) Distance pieces to platform lines shall be fixed at about \_\_\_\_\_m. a) 30  
b) 13 c) 45 d) 60
- 111 ) Permitted vertical wear for 60kg tongue rails \_\_\_\_\_mm a) 6 b) 8  
c) 5 d) 4
- 112 ) Permitted vertical wear for 52kg tongue rails \_\_\_\_\_mm  
a) 6 b) 8 c) 5 d) 4
- 113 ) Permitted vertical wear of stock rail for 60kg section is \_\_\_\_\_mm a) 6 b) 8  
c) 5 d) 4
- 114 ) Permitted vertical wear of stock rail for 52 kg section is \_\_\_\_\_mm a) 6  
b) 8 c) 5 d) 4
- 115 ) Versines in lead/turn in curve shall not beyond \_\_\_\_\_ from its designed value.  
a)  $\pm 3$  b)  $\pm 4$  c)  $\pm 2$  d) 60
- 116 ) Hogging of a rail end is measured by \_\_\_\_\_cm straight edge at the center.  
a) 1 b) 60 c) 15 d) 10
- 117 ) Slope of the formation top at ballast level shall be \_\_\_\_\_  
a) 1 in 40 b) 1 in 30 c) 1 in 20 d) 1 in 50
- 118 ) Maximum value of rate of change of cant is \_\_\_\_\_mm per Second. a) 35  
b) 55 c) 40 d) 65
- 119 ) Maximum value of cant gradient permitted is \_\_\_\_\_  
a) 1 in 720 b) 1 in 360 c) 1 in 1000 d) 1 in 1200
- 120 ) Angle of crossing between road approaches and track at level crossing shall not be less than \_\_\_\_\_  
a)  $45^\circ$  b)  $60^\circ$  c)  $40^\circ$  d)  $75^\circ$
- 121 ) Height gauges in level crossing should be located at a minimum distance Of \_\_\_\_\_m from gate post.  
a) 8 b) 6 c) 10 d) 12
- 122 ) Speed breaker at LC shall be provided at location with in railway boundary, at a maximum feasible distance but, not exceeding \_\_\_\_\_m  
a) 20 b) 30 c) 45 d) 50

- 123 ) An unmanned level crossing has to be manned immediately if it gets involved in more than \_\_\_\_\_ no. of accidents in \_\_\_\_\_ years a) three, 3 b) three, 5 c) three, 2 d) three, 6
- 124 ) In difficult terrain a diversion may be laid with radius not less than \_\_\_\_\_ m  
a) 225 b) 440 c) 875 d) 200
- 125 ) Minimum length of fencing at a level crossing shall be \_\_\_\_\_ m a) 15 b) 13 c) 30 d) 20
- 126 ) Walking speed of a patrol man is normally \_\_\_\_\_ kmph a) 3 b) 4 c) 5 d) 6
- 127 ) The complete overhauling of the entire track will be accomplished within a period of 03 to 05 years by which system of track maintenance.  
a) 3 Tier system of track maintenance  
b) Conventional system of track maintenance  
c) Both a & b d) None of above.
- 128 ) Works such as lubrication of rails joints joint gap adjustments as required and realignment of curves should be done during which period.  
a) Post monsoon attention b) Pre monsoon attention  
c) Attention during monsoon d) All of above.
- 129 ) While doing a through packing on B.G, the ballast should be opened on either side of rail seats to the extent of .  
a) One end of the sleeper to the other end  
b) End of sleeper to 500mm in side of the rail seats  
c) End of sleeper to 450mm out side of the rail seats d) End of sleeper to 450mm in side of the rail seats
- 130 ) While opening of the road, care should be taken to see that the ridge between the rails does not project.  
a) More than 75mm. b) Less than 50mm. c) More than 50mm. d) More than 100mm.
- 131 ) When slewing, the crow bars should be planted well into the ballast at an angle from the vertical.  
a) Not more than 45° b) Not less than 45°  
c) Not more than 30° d) Not less than 30°
- 132 ) It is imperative that when joints are picked up, at least \_\_\_\_\_ sleepers on either side of the joints are packed.  
a) One b) two c) Three d) Four
- 133 ) In manual deep screening work, number of through packings required to make normal speed.  
a) 4 b) 2 c) 3 d) Either (a) & (b)

- 134 ) In manual deep screening work, on which days second & third through packing are to be done  
a) 3rd & 9th      b) 3rd & 10th  
c) 4th & 9th      d) 2nd & 10th
- 135 ) How many packings are required to make the normal speed for deep screening work by machine packing.  
a) 2    b) 1    c) 4    d) 3
- 136 ) For lubrication of rail joints which caution order is required.  
a) 20 KMPH    b) 30 KMPH    c) 20 / OES    d) OES
- 137 ) For lubrication of rail joints under the supervision of keyman, how many joints normally be opened at a time.  
a) One Joint      b) Two joints opposite each other    c) Consecutive joints  
d) Two joints
- 138 ) Bucking of track occurs when \_\_\_\_\_ forces are created in the rails associated with inadequacy of forces in the track at the place.  
a) Tensile & lateral      b) Compressive & lateral  
c) Tensile & compressive    d) All of the above.
- 139 ) Which instrument is used for measuring hogging on rail ends  
a) 1 meter long straight edge    b) Leveling instrument  
c) Compass      d) Nylon cord
- 140 ) In certain locations, rail table develops ridges and hollows, it is called:  
a) Wheel burns    b) Hogging  
c) Battering      d) Corrugation
- 141 ) The standard length of the fish bolt spanner is \_\_\_\_\_mm  
a) 600 to 700    b) 550 to 600    c) 680 to 760    d) 700 to 750.
- 142 ) Wear of the tongue rail for fan shaped layout shall be measured at \_\_\_\_\_ mm distance from ATS  
a) 464    b) 1046    c) 814      d) 1682
- 143 ) How many wooden sleepers / KM to be test checked by ADEN on the given proposals for renewal of wooden sleepers by PWI  
a) 20Nos.      b) 50 Nos.      c) 40 Nos.      d) 30 Nos.
- 144 ) When a rail fracture of a less than 25mm gap observed on the girder bridge, the minimum official to pass a train.  
a) Keyman      b) Mate      c) PWI      d) AEN
- 145 ) The height gauge shall be at a height of \_\_\_\_\_m above road level  
a) 4.67      b) 5.67      c) 3.57      d) 4.50

- 146 ) Traction bonds are provided.(i) To keep a distance of infringement (ii) To ensure reliable electrical current continuity (iii) To ensure proper earthing in case of leakage of current.(iv) Age for earth in case of power block.  
a) (i) & (ii)      b) (ii) & (iii)      c)(iii) & (iv)      d)(iv) & (i)
- 147 ) In D.C. traction system the whole return current flows through\_\_\_\_\_ a)  
Longitudinal rail bonds      b) Cross bonds  
c) Structure bonds      d) All the above.
- 148 ) OHE power block required for (a) Painting of plate girder bridge (b) Painting of platform cover (c ) Painting of steel works of through girder bridge (d) Painting of rails.  
a) a & d      b) b & c      c) a & b      d) all
- 149 ) Service life in terms of \_\_\_\_\_ GMT for considering renewal on the bridge proper and in approaches for 52Kg. 90UTS rails.  
a) 525      b) 550      c) 375      d) 262.5
- 150 ) Flattering of inner rail table of a curve is due to  
a) Cant excess      b) Cant deficiency  
c) Both a & b      d) None of the above
- 151 ) In the OMS peaks, location to be urgently attended when peak exceeds:  
a) 0.35g      b) 0.40g      c) 0.25g      d) 0.20g.
- 152 ) Minimum authorized level of supervision for dip - lorry working is \_\_\_\_\_.  
a) PWI      b) PWS      c) Mate      d) Key man
- 153 ) Rated out put of 3 x tamping express is \_\_\_\_\_sleepers per Hour      a) 2200  
b) 1800      c) 2500      d) 2700 .
- 154 ) The length of the guard rail outside ballast wall to be maintained to same clearance as on bridge is \_\_\_\_\_mm.  
a) 4875      b) 1675      c) 1800      d)1825
- 155 ) Maximum speed restriction in case of distressed bridge category No.I is\_\_\_\_\_KMPH :  
a) 15      b) 20      c) 10      d) 30.
- 156 ) The diameter of hook bolts to fix the sleepers with girders is— mm      a) 25  
b) 32      c) 20      d) 22
- 157 ) Minimum clearance of check rail for a curve is\_\_\_\_\_mm.  
a) 44      b) 75      c) 70      d) 51
- 158 ) ANC is kept \_\_\_\_\_ mm below rail level.  
a) 2      b) 2.5      c) 3      d) 6
- 159 ) For pre-tamping attention, super elevation should be marked on every  
a) 2<sup>nd</sup> sleeper      b) 3<sup>rd</sup> sleeper  
c) 4<sup>th</sup> sleeper      d) 5<sup>th</sup> sleeper

- 160 ) While doing tamping on PSC sleepers, number of insertions necessary  
a) Two b) Three c) One d) Four
- 161 ) For spans more than 6.1m bridges, the preferred position of rail joint is at —  
a)  $1/3^{\text{rd}}$  span b)  $1/4^{\text{th}}$  of span  
c)  $1/2$  of span d)  $2/3^{\text{rd}}$  of span
- 162 ) Running surface of the CMS x-ing gets work hardened after passage of \_\_\_\_\_ GMT of traffic  
a) 10 b) 5 c) 20 d) 40
- 163 ) Life of the CMS x-ing is \_\_\_\_\_ times more than the built up Xing. a) 05 to 06 b) 2 to 3 c) 4 to 5 d) 3 to 4
- 164 ) According to the track laying standards maximum un squareness permitted is  
a)  $\pm 10\text{mm}$ . b)  $\pm 20\text{mm}$ . c)  $\pm 5\text{mm}$ . d)  $\pm 6\text{mm}$ .
- 165 ) In chemical composition of MM rail, percentage of carbon is —  
a) 0.04% b) 0.03% c) 0.02%
- 166 ) When a diamond crossing is laid on a curved track, the maximum speed should not exceed \_\_\_\_\_ KMPH  
a) 65 b) 50 c) 30
- 167 ) The length of fish plates of Glued joints are \_\_\_\_\_ mm  
a) 950 b) 600 c) 750 d) 800
- 168 ) The gauge adjustment possible for CST sleepers is \_\_\_\_\_ mm  
a)  $\pm 5$ . b)  $\pm 6$ . c)  $\pm 3$ .
- 169 ) 1 in 8  $\frac{1}{2}$  crossing angle  
a)  $6^{\circ} 32' 45''$  b)  $4^{\circ} 45' 47''$   
c)  $6^{\circ} 42' 35''$  d)  $6^{\circ} 42' 45''$
- 170 ) The longitudinal section of the line shall be up dated by surveying the longitudinal profile of the line atleast once \_\_\_\_\_ years ? a) 5 . b) 10 . c) 3 .  
d) 4 .
- 171 ) The sighting distance for slewing of track by a mate on straight line should be \_\_\_\_\_ mtr  
a) 30 to 60 . b) 13 to 30 . c) 30 to 45 . d) 45 to 60 .
- 172 ) What is the easement gradient for passage of trains during lifting of track ?  
a) 25mm per 13mtrs. b) 15mm per 13mtrs.  
c) 20mm per 13mtrs. d) 13mm per 13mtrs.

- 173 ) In points & Crossings there should be no junction fish plates at SRJ and heel of crossing. What is the minimum length required to be maintained on either side of points & crossing should have same section ?  
 a) Atleast one rail length    b) Atleast 3 rail length  
 c) Atleast 2 rail length    d) Atleast 5 rail length
- 174 ) The permissible limits for renewal of 60kg rail for vertical wear is \_\_\_\_mm  
 a) 8    b) 6    c) 5    d) 10
- 175 ) What is the maximum permissible limit for vertical wear in mm for 52kg/90R rail?  
 a) 8    b) 6    c) 5    d) 4
- 176 ) The location of JOH from ATS for 10125 mm CS on PSC BG 60kg RT 4219 is \_\_\_\_\_mm  
 a) 5836    b) 5830    c) 4620    d) 5636
- 177 ) The frequency of deep screening of track is \_\_\_\_\_yrs  
 a)10    b)5    c)3    d)not mentioned
- 178 ) The bed level of the side drain should be \_\_\_\_\_cm. below the formation level required for efficient drainage of cuttings and catch water drains.  
 a) 30    b) 45    c) 60    d) 15
- 179 ) The minimum length of rail to be cut in case of buckling of track occur or appears is \_\_\_\_\_mtrs  
 a) 6.5    b) 4    c) 6    d) 13
- 180 ) The weight of standard keying hammer is \_\_\_\_\_kg    a) 1.8    b) 2    c) 1.6    d) 1.2
- 181 ) The minimum recommended rail section for traffic density 10-20 GMT on A and B class routs is \_\_\_\_\_  
 a) 60kg    b) 52kg    c) 90R
- 182 ) The frequency of visual examination of rails on important girder bridges and their approaches is \_\_\_\_\_  
 a) Twice a year    b) annually  
 c) Once in 3 yrs    d) Once in 6 months
- 183 ) The admissible speed after doing the emergency repairs by a mate/keyman in case of rail fracture/weld failure is \_\_\_\_\_KMPH  
 a)20    b)30    c)10    d)Stop dead & proceed
- 184 ) The minimum length of permanent rail closure required for locations such as 500 mtrs of both side approaches of tunnels, tunnel proper, major and important bridges including bridge proper, deep cuttings and high embankments is \_\_\_\_\_mtr  
 a) 11    b) 13    c) 6.5    d) 36

- 185 ) In case of rail fracture detected visually the length of rail piece that has to be sent to the Zonal railway chemist and metallurgist by PWI directly is———mtr  
a) 2 b) 1 c) 1.5 d) 1.2
- 186 ) At locations where ever there is a change in the type of sleepers, bridges and level crossings approaches, what is the minimum length of track should be fully boxed with ballast on either side of the junction ?  
a) 6 Rail lengths b) 3 Rail lengths  
c) 2 Rail lengths d) 5 Rail lengths
- 187 ) The minimum length of well anchored SWR on either side for isolation of LWR/CWR in case of the track on girder bridges not laid with LWR/CWR is \_\_\_\_\_mtrs  
a) 36 b) 50 c) 100 d) 13
- 188 ) The minimum width of the cess to be provided on bridge approaches for a length of about 100 mtrs is———cm  
a) 90 b) 60 c) 45 d) 100
- 189 ) If the No. of normal attentions to track are —— in a year , formation is called bad formation.  
a) 06-12 b) 03to 6 c) 12 to 16 d) >12
- 190 ) What is the limiting loss of rail section for 52kg rail as a criterion for recommending rail renewal ?  
a)6% b)3% c)8% d)4%
- 191 ) The interval of levels required to be taken of the existing track for preparing the gradient diagram is———mtrs.  
a)20 b)25 c)30 d)10
- 192 ) The spacing of sleepers that can be permitted with respect to theorotical spacing is———mm  
a)  $\pm 20$  b)  $\pm 10$  c)  $\pm 25$  d)  $\pm 40$
- 193 ) Variation in longitudinal level which can be permitted is \_\_\_\_\_mm,  
a) 50 b) 100 c) 40 d) 25
- 194 ) The maximum value of cant deficiency for speeds in excess of 100 KMPH on group A & B routes is———mm  
a) 100 b) 75 c) 110 d) 165
- 195 ) The minimum straight length between two transitions of reverse curves for high speed in group A & B routes is———mts.  
a) 50 b) 30 c) 100 d) 13
- 196 ) The permissible speed allowed on 1 in 8 ½ symmetrical split with curved switches 52kg/60kg on PSC sleepers is———KMPH  
a) 30 b) 15 c) 45 d) 50
- 197 ) The minimum radius of vertical curve to be kept in group B routes is \_\_\_\_\_mtrs  
a) 3000 b) 4000 c) 6000 d) 4500

- 198 ) SWR shall not butt against insulated joints, Heel of crossing and stock rail joints What is the minimum length shall be interposed to isolate the SWR from such Location ?  
 a) Two rail lengths                      b) 3 rail lengths  
 c) 5 rail lengths                          d) one rail lengths
- 199 ) The anticipated residual life of the rail required for conversion of SWR to LWR is at least \_\_\_\_\_ Years  
 a) 10                      b) 20                      c) 30                      d) 15
- 200 ) What is the number of points exceeding the outer limit of irregularity under each category is allowed in 1 KM in TRC run ?  
 a) 10 points                      b) 8 points  
 c) 6 points                          d) 12 points
- 201 ) For qualifying to ROB/RUB, what is the minimum TVU required at manned LC gates ?  
 a) 1 lakh                          b) 50000  
 c) 40000                          d) 150000
- 202 ) what is the maximum length of welded pannel that can be permitted to carry by rail dolly ?  
 a)3 RP                      b)5 RP                      c)2 RP                      d)10 RP
- 203 ) In the case of bridge openings less than \_\_\_\_\_ mtrs. rail joints should be avoided.  
 a) 6.1                      b) 3.6                      c) 12                      d) 18.3
- 204 ) No fish plated joints should be located on the girder or within \_\_\_\_\_ mtr from either abutment.  
 a) 6                      b) 13                      c) 10                      d) 4
- 205 ) In the case of girder bridges (un ballasted deck) LWR can be continued over bridges where overall length is not more than \_\_\_\_\_ mtrs.  
 a) 20                      b) 23                      c) 45                      d) 30
- 206 ) The clear distance between joint sleepers on girder bridges should not exceed \_\_\_\_\_ mm.  
 a) 200                      b) 300                      c) 450                      d) 580
- 207 ) No part of the tree shall be nearer than \_\_\_\_\_ Mtr from the nearest live conductor.  
 a) 4                      b) 2                      c) 6                      d) 1 mtr
- 208 ) While unloading of rails along the track, care shall be taken that rails do not touch each other to form a continuous metallic mass of length greater than \_\_\_\_\_ mtrs.  
 a) 300                      b) 30                      c) 60                      d) 100
- 209 ) Permanent way staff are advised to keep clear of the tracks and avoid contact with the Rails when an electrically hauled train is within \_\_\_\_\_ mtrs  
 a) 250                      b) 100                      c) 150                      d) 200
- 210 ) Corrosion beyond \_\_\_\_\_ mm in the web and foot may be taken as criterion for wear due to corrosion.  
 a) 1.5                      b) 2                      c) 1                      d) 2.5

- 211 ) Second quality rails which shall be used only in loop lines and sidings, should be with speed restricted to \_\_\_\_\_ KMPH.  
a) 50      b) 30      c) 75      d) 45
- 212 ) Length of virtual transition is \_\_\_\_\_ mtrs. on BG.  
a) 14.6      b) 13      c) 20      d) 30
- 213 ) Maximum permissible cant in BG is \_\_\_\_\_ mm.  
a) 75      b) 100      c) 60      d) 50
- 214 ) There should be no change of cant between points for a length of \_\_\_\_\_ Mtrs outside the toe of the switch and nose of crossing.  
a) 20      b) 30      c) 13      d) 45
- 215 ) A vertical curve shall be provided only at the junction of the grade when the algebraic difference between the grades is equal to or more than \_\_\_\_\_ mm per mtrs.  
a) 4      b) 2      c) 3      d) 5
- 216 ) Gauge face lubricators should be provide on curve of radius \_\_\_\_\_ mtrs and less.  
a) 600      b) 440      c) 875      d) 583
- 217 ) On PSC sleepers, SWR may be laid on curves with radius not less than \_\_\_\_\_ Mts.  
a) 440      b) 875      c) 600      d) 583
- 218 ) For OMS – 2000 speeds above 100Kmph the frequency of recording is once in every \_\_\_\_\_ months  
a) 1      b) 2      c) 3      d) 4
- 219 ) In OMS-2000 run, the track needs urgent attention if the peaks of lateral & vertical exceeds\_\_\_\_\_  
a) 0.35g      b) 0.40g      c) 0.50g      d) 0.25g
- 220 ) In OMS-2000 run for high speed route if the number vertical and lateral peaks are 1 to 2 per km the track is considered as \_\_\_\_\_.  
a)good      b)bad      c) average      d)very good
- 221 ) The normal life of the detonators is \_\_\_\_\_ years.  
a) 7      b) 6      c) 10      d) 11
- 222 ) Detonators should not be used after \_\_\_\_\_ years.  
a) 10      b) 6      c) 10      d) 11
- 223 ) The fusee normally burns for \_\_\_\_\_ Minutes.  
a) 7      b) 6      c) 10      d) 4
- 224 ) Visibility of trains for road users at manned LC's may be assessed from a distance of \_\_\_\_\_ mtrs from the centre line of the nearest track.  
a) 5      b) 3      c) 6      d) 10

- 225 ) Rail joints should be avoided in check rails and on running rails, within the LC gate and \_\_\_\_\_ mtrs on either side  
a) 5      b) 3      c) 6      d) 10
- 226 ) Minimum distance of gate lodge from centre line of nearest track for all manned LC gates is \_\_\_\_\_ mtrs  
a) 5      b) 3      c) 6      d) 10
- 227 ) The length of each patrol beat should not normally exceed \_\_\_\_\_ Km  
a) 5      b) 4      c) 3      d) 10
- 228 ) A period of at least \_\_\_\_\_ minutes rest is desirable between consecutive beats during patrolling of track by Patrol man. a) 30      b) 20      c) 40  
d) 60
- 229 ) Every rail dolly shall be manned by not less than \_\_\_\_\_ nos. of able bodied persons.  
a) 2      b) 3      c) 4      d)
- 230 ) The person- in-charge for the working of rail dolly shall be a railway servant not lower in rank than a \_\_\_\_\_  
a) Key man      b) Track man-I  
c) Mate      d) PWM
- 231 ) Rail dolly shall not be used in sections having gradients sleeper than \_\_\_\_\_  
a) 1 in 200      b) 1 in 100      c) 1 in 150      d) 1 in 400
- 232 ) When more than one track machine is running in a block section, There should be a minimum distance of \_\_\_\_\_ mtrs between two units  
a) 120      b) 100      c) 50
- 233 ) Extra shoulder ballast of \_\_\_\_\_ mm should be provided on out side of the turn in curve.  
a) 150      b) 200      c) 300      d) 450
- 234 ) On new lines and on old lines where complete renewal or through sleeper renewal is carried out, the track should laid on straight including curves of radius up to 350 mtrs. and more the gauge to be provided is \_\_\_\_\_  
a) -5 to +3mm      b) -3 to +3 mm  
c) -5 to +5 mm      d) -3 to +5 mm
- 235 ) Top of the creep indication post should be about \_\_\_\_\_ mm above the rail level and chisel mark for measuring the creep  
a) 25      b) 50      c) 60      d) 20
- 236 ) What is the rail section on Broad Gauge on "E" class Route with traffic density more than 20GMT?  
a) 60Kg(New)      b) 60Kg(SH)  
c) 52Kg(New)      d) 52Kg(SH)
- 237 ) Minimum ballast cushion under rail seat of a PRC sleeper is \_\_\_\_\_ mm  
a) 150      b) 200      c) 250      d) 300

- 238 ) As per advance correction slip 102, clear distance between two consecutive sleepers on bridge, for all new works like rebuilding, regirding or through sleeper renewal shall be \_\_\_\_\_mm  
a) 450    b) 600    c) 740    d) 300
- 239 ) In level crossings minimum straight length of road outside the gate on Class-I roads is \_\_\_\_\_mtr  
a) 15    b) 9    c) 4.5    d) 12
- 240 ) In level crossings minimum straight length of road outside the gate on Class-II roads is \_\_\_\_\_Mtr  
a) 15    b) 9    c) 4.5    d) 12
- 241 ) In level crossings minimum straight length of road outside the gate on class-III roads is \_\_\_\_\_Mtr  
a) 15    b) 9    c) 4.5    d) 12
- 242 ) In level crossings warning sign board to road traffic of the proximity of level crossing in plain country should be provided at a distance of \_\_\_\_\_ Mtr in class-I roads from level crossings  
a) 120    b) 60-90    c) 40    d) 100
- 243 ) In level crossings warning sign board to road traffic of the proximity of level crossing in plain country should be provided at a distance of \_\_\_\_\_mts in class-II roads from the level crossing.    a)120    b) 60-90    c)40    d)100
- 244 ) In level crossings warning sign board to road traffic of the proximity of level crossing in plain country should be provided at a distance of \_\_\_\_\_ mts. in class-III roads from the level crossing.  
a) 120    b) 60-90    c) 40    d) 100
- 245 ) Wear of rails is to be periodically recorded and gauge face lubricators are to be provided on curves with radius \_\_\_\_\_m and less on B.G  
a) 600    b) 440    c) 423    d) 583
- 246 ) The distance of W/L boards for unmanned level crossings on single line section where visibility is clear should be \_\_\_\_\_ m  
a) 350    b) 600    c) 500    d) 1200
- 247 ) Railways may de-man any existing level crossing gate in case the TVU falls below \_\_\_\_\_% of value of criteria for manning  
a) 50%    b) 60%    c) 70%    d) 80%
- 248 ) Maximum speed permitted for diamond on a curve on BG is \_\_\_\_\_KMPH  
a) 45    b) 50    c) 65    d) 75
- 249 ) Minimum straight length required between a curve and heel of acute crossing of diamond necessary to permit unrestricted speed over the diamond is \_\_\_\_\_ mm  
a) 50    b) 30    c) 39    d) 100
- 250 ) Permissible speed on turnout with 1 in 8½ curved switch is \_\_\_\_\_KMPH  
a) 15    b) 30    c) 45    d) 20

- 251 ) Permissible speed on turnout with 1 in 12 curved switch is —KMPH  
a) 15      b) 30      c) 45      d) 20
- 252 ) Permanent way inspector shall submit reports on the state of track in his charge, to the divisional engineer through assistant engineer once in every \_\_\_\_ months  
a) 2      b) 3      c) 6      d) 9
- 253 ) Whenever in reverse curves neither straight can be eliminated nor a straight of minimum 50 meters can be provided on B.G speed in excess of \_\_\_\_\_KMPH should not be permitted.  
a) 50      b) 75      c) 100      d) 130
- 254 ) The desirable length of transition of curve is based on rate of change of cant and cant deficiency \_\_\_\_\_mm per second.  
a) 35      b) 45      c) 55      d) 75
- 255 ) In exceptional cases where desirable length of transition is not possible to provide minimum length of transition is decided based on the assumption that rate of change of cant/cant deficiency is \_\_\_\_\_.  
a) 35      b) 45      c) 55      d) 75
- 256 ) Spreading of rail table (of inner rails of curve) is an indication of over loading on one rail and such tendency can be reduced by providing \_\_\_\_\_ cant  
a) appropriate cant      b) reduced cant  
c) excess cant      d) a & b above
- 257 ) Minimum sleeper density on BG on A,B,C & D Spl. Routes having traffic density more than 10 GMT is \_\_\_\_\_ per Km.  
a) 1340      b) 1540      c) 1660      d)
- 258 ) Minimum sleeper density on loop lines and private sidings on BG in any route is  
a) 1340      b) 1540      c) 1660      d)1440
- 259 ) For LWR/CWR track, the minimum sleeper density should be \_\_\_\_ per Km.  
a) 1340      b) 1540      c) 1660      d)1880
- 260 ) Deep screening should be carried out in following circumstances  
a) Before converting existing track fish plated/SWR into LWR or CWR  
b) Prior to complete track renewal  
c) Once in ten years  
d) In all cases mentioned in (a),(b) & (c) above
- 261 ) Deep screening work is to be done under the supervision of an official not lower in rank than  
a) PWI Gr-III      b) PWS      c) Mate      d) Keyman
- 262 ) At all interlocked and partially interlocked stations signal staff will be responsible for cleaning and lubrication of slide chairs in  
a) All sleepers of point zone  
b) All sleepers upto JOH      c) Three sleepers from ATS      d)None of the above.

- 263 ) The variation in versine at two consecutive stations in lead curve and turn-in-curve portion should not be more than \_\_\_\_\_ mm and versine at each station should also not be beyond \_\_\_\_\_ mm from its designated value
- a) 2mm ; + 2mm                      b) 3mm ; + 3mm  
c) 4mm ; + 3mm                      d) 4mm ; + 2mm
- 264 ) Arranging immediate relief for gatemen in case of sickness, they are unable to perform the duty, is responsibility of \_\_\_\_\_
- a) Section PWI    b) Incharge PWI    c) Mate
- 265 ) What are the Tolerable limits of gauge during maintenance for 5° on BG?
- a) 6 to +15mm                      b) -6 to +19mm                      c) -3 to +3 mm
- 266 ) What are the Tolerable limits of gauge during maintenance of curves sharper than 5° on BG?
- a) Upto +20mm    b) upto +19mm  
c) -6 to +15 mm    d) upto +40mm
- 267 ) The maximum permissible lift / lowering at a time even under speed restriction is \_\_\_\_\_mm
- a) 75                      b) 50                      c) 100                      d) 60
- 268 ) The maximum number of consecutive jammed joints can be permitted in single rails are \_\_\_\_\_
- a) 6                      b) 4                      c) 10                      d) 8
- 269 ) The maximum permissible amount of creep is \_\_\_\_\_mm
- a) 150                      b) 100                      c) 200                      d) 180
- 270 ) The checkrail clearance opposite X-ing of BG (1673 gauge) is \_\_\_\_\_mm
- a) 41 to 44                      b) 44-48                      c) 51-57
- 271 ) The minimum height of ballast stack in depot collection of ballast is\_\_\_\_m
- a) 1                      b) 1.2                      c) 2                      d) 0.9
- 272 ) Without taking permit to work from OHE staff, the work shall not be done in the vicinity of live parts within a distance of \_\_\_\_\_m
- a) 1                      b) 1.2                      c) 2                      d) 0.9
- 273 ) LC is to be upgraded to Spl class, when TVU's more than \_\_\_\_\_
- a) 50000    b) 40000    c) 60000    d) 45000
- 274 ) The distance of whistle board for U/M L.Cs on single line section where visibility is clear is \_\_\_\_\_m
- a) 350                      b) 600                      c) 400                      d) 450
- 275 ) Keymen, Mates, PWMs and PWIs are to be sent for refresher course training once in \_\_\_\_\_ yrs.
- a) 5 .                      b) 3                      c) 4                      d) 6

- 276 ) The minimum radius of curve on BG track is \_\_\_\_\_ Mtrs  
a) 175    b) 223    c) 190    d) 200
- 277 ) The maximum degree of curvature on a turnout is \_\_\_\_\_  
a) 8°    b) 10°    c) 4°    d) 6°
- 278 ) Painting of weld collars shall be done for — cm on either side of weld  
a) 10    b) 15    c) 20    d) 30
- 279 ) The frequency of Rail painting in heavy corrosion area is once in \_\_\_\_years  
a) 4    b) 3    c) 2    d) 1
- 280 ) The frequency of painting of weld collars is \_\_\_\_\_ yrs  
a) 4    b) 3    c) 2    d) 1
- 281 ) For preparation of patrol charts the maximum distance covered by a patrolman should be taken as \_\_\_\_\_Km  
a) 20    b) 25    c) 30    d) 18
- 282 ) When motor trolley is worked with out block protection, in clear visibility location and with proper protection, it should be manned by at least... trolly man  
a) 4    b) 6    c) 2    d)
- 283 ) Pushing of material trains should not be permitted where gradient is steeper than  
a) 1 in 100    b) 1 in 150  
c) 1 in 200    d) 1 in 400
- 284 ) The maximum in built twist on a transition curve is \_\_\_\_\_ mm / metre for BG.  
a) 2.8    b) 3.6    c) 3    d) 5.5
- 285 ) For class-II second hand rails Fit for use in running lines- Ends to be painted with \_\_\_\_\_ colour  
a) White    b) Yellow    c) Red    d) Green
- 286 ) For class-II second hand rails Fit for use in non-running lines Ends to be painted with \_\_\_\_\_ colour  
a) White    b) Yellow    c) Red    d) Green
- 287 ) For class-II second hand rails Unserviceable rails not fit for use Ends to be painted with \_\_\_\_\_ colour  
a) White    b) Yellow    c) Red    d) Green
- 288 ) In track circuited section clearance of ballast from foot of rail should not be less than \_\_\_\_\_mm  
a) 50    b) 40    c) 30    d) 60

- 289 ) If gauge of track adjoining the points and crossings is maintained wider/tighter than the gauge on points and crossings the gauge on adjoining track must be brought to the same gauge as in the points and crossings and run out at the rate of \_\_\_\_\_ to the requisite extent.
- a) 1mm/3M      b) 2mm/3M  
c) 3mm/3M      d) 1.5mm/3M
- 290 ) On B.G in the case of cause ways that are flooded and velocity is insignificant and when P.Way inspector has satisfied himself by walking over and probing the permanent way is intact and in a fit condition the max. depth of water above rail level at which passenger and mixed trains can be allow is \_\_\_\_\_mm and similarly the depth of water permitted in case of a goods train is \_\_\_\_\_mm
- a) 300;450      b) 200;300  
c) 300;400      d) 250;450
- 291 ) In level crossing minimum width of mettalling outside gates must be tapered to existing carriage width within a distance of \_\_\_\_\_mtr
- a) 30      b) 20      c) 40      d) 8
- 292 ) Recommended gradient in station yard for new work \_\_\_\_\_
- a) 1 in 400      b) 1 in 1200  
c) 1 in 1000      d) 1 in 800
- 293 ) The Maximum Permissible value for Cant deficiency is \_\_\_\_\_ mm on Group'A' route with nominated rolling stock.
- a) 100      b) 75      c) 125      d) 165
- 294 ) For Level crossings with PSC sleepers, in no case opening to be delayed by more than \_\_\_\_\_ years
- a) 2      b) 3      c) 1      d) 4
- 295 ) A Gateman should have a Certificate of Fitness of class \_\_\_\_\_ from Medical department.
- a) A-3      b) A-1      c) B-1      d) C
- 296 ) At what distance from a danger location 3 detonators should be fixed on BG track.
- a)1200m      b)1000m      c)600m      d)800m
- 297 ) The minimum Center to Center distance of BG track in mid section is \_\_\_\_\_ mm
- a) 4265      b) 5300      c) 4765      d) 5030

### Fill in the Blanks

- 1 During lubrication of rail joints under the supervision of Keyman, there should be not less than \_\_\_\_\_connecting rail should be ensured.
- 2 Designed versine for 1 in 8½ T/out and 1 in 12 T/out are \_\_\_\_\_
- 3 On sanded catch siding, the rails shall be kept clear of sand at a distance \_\_\_\_\_ Beyond section insulator.
- 4 Cant should be indicated by painting its values on \_\_\_\_\_

- 5 The approach curves of diamond crossing already laid should be laid \_\_\_\_\_.  
on either side of diamond crossing.
- 6 Other than Railway servant can travel on push trolley / Motor trolley by \_\_\_\_\_
- 7 In sections with permitted speed more than 75KMPH after doing relaying of track, speed  
must be made normal with manual packing on \_\_\_\_\_ day and with machine packing on  
\_\_\_\_\_ day
- 8 The trees and bushes that interfere or tend to interfere with the view from train or trolley, of  
signals or level crossings or along the inside of curves, shall be cut. When such trees or  
bushes require to be cut which exist in private land it is dealt as laid down in \_\_\_\_\_ of  
Indian Railway Act.
- 9 The second summation of versine difference represents \_\_\_\_\_ at any stations?
- 10 If the ruling gradient of a section is 1 in 200, flattened gradient to be provided on a curve  
with radius 583 meters is \_\_\_\_\_
- 11 "When "L" is length of transition, "R" is radius of curve and "S" is shift. Then  $S = \frac{L^3}{8R}$ "
- 12 Longitudinal movement of rail is called \_\_\_\_\_
- 13 Correcting couples apply for \_\_\_\_\_
- 14 Equilibrium cant for turnout curve in contrary flexure \_\_\_\_\_
- 15 Over non transitioned curve cant has to be run up and run out over some distance it is  
called \_\_\_\_\_
- 16 Minimum percentage of machine crushed ballast should retain on 20mm Sq mesh sieve  
is \_\_\_\_\_
- 17 Thickness of web of 60kg T/Rail in thick web switch is \_\_\_\_\_
- 18 Diamond Xing should not be flatter than \_\_\_\_\_
- 19 Track centre in new work in case of double line section is \_\_\_\_\_ mm
- 20 Sanction authority of 'C' class ODC is \_\_\_\_\_
- 21 Length of virtual transition is based on bogie centre distance and is equal to  
\_\_\_\_\_ m for B.G.
- 22 Length required to resist the pull extended on rail by rail tensor is called \_\_\_\_\_
- 23 The maximum permissible value for actual Cant, Cant deficiency and Cant Excess are  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ mm respectively for BG, Group-"E" route.
- 24 A  $2\frac{1}{2}^\circ$  Curve on 20 Mtr chord length will have \_\_\_\_\_ mm Versine on Circular portion.
- 25 At Night Gateman should lit two Nos hand signal lamps and exhibit \_\_\_\_\_ colour HS  
lamps to Driver and Guard while passage of train.
- 26 The Min. & Max. clearances of Check rails at LC should be \_\_\_\_\_ mm and \_\_\_\_\_  
mm.
- 27 The Census of Level Crossing is carried out by a Multi-disciplinary inspectorial team  
consisting of representatives of \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ departments
- 28 The TVU of Level Crossing between 25,000 and 20,000 is \_\_\_\_\_ class level crossing.
- 29 The classification of Level Crossing shall be based on volume of rail and road traffic and  
\_\_\_\_\_ conditions.
- 30 length of a PSC sleeper is \_\_\_\_\_ mm .
- 31 The Max weight of a ER clip \_\_\_\_\_ Kg.
- 32 The dia of a ER clip Mark-III is \_\_\_\_\_ mm.
- 33 The length of 60Kg Glued Joint fish plate is \_\_\_\_\_ mm
- 34 In a Left hand turnout, \_\_\_\_\_ end side stock rail will be given straight bend and  
the location of this bend will be at \_\_\_\_\_

- 35 Minimum depth of space for wheel flange from rail level in BG is \_\_\_\_ mm.
- 36 For building structures on BG, the maximum horizontal distance from centre of track to any structure from rail level to 305 mm above rail level is \_\_\_\_\_ mm.
- 37 Minimum height above rail level for a distance of 915 mm on either side of the Center of track for BG for overhead structure is \_\_\_\_ mm.
- 38 Versine of a tongue rail on 1 in 8½ symmetrical split will be \_\_\_\_
- 39 Surface water flowing from top of hill slope towards the track can be diverted by provision of \_\_\_\_\_
- 40 The permissible limit of flat wheel on rolling stock for BG Diesel locomotives \_\_\_\_ mm
- 41 The permissible limit of flat wheel on rolling stock for BG ICF and BEML Coaches is \_\_\_\_\_ mm
- 42 The permissible limit of flat wheel on rolling stock for BG IRS Coaches is \_\_\_\_ mm
- 43 The permissible limit of flat wheel on rolling stock for BG Wagons is \_\_\_\_ mm
- 44 The frequency of greasing on rail gauge face for BG track for curves sharper than 600m is \_\_\_\_\_ .
- 45 The frequency of greasing on rail gauge face for BG track for curves with radius more than 600m is \_\_\_\_\_ .
- 46 The frequency of greasing on rail gauge face for BG track for all other locations like turnouts & SEJs is \_\_\_\_\_.
- 47 For calculation of TGI value, the card length for unevenness is \_\_\_\_\_ mts.
- 48 For calculation of TGI value, the card length for Twist is \_\_\_\_\_ mts.
- 49 For calculation of TGI value, the card length for Alignment \_\_\_\_\_ mts.
- 50 In TRC run, the standard deviation for unevenness for newly laid track is \_\_\_\_\_
- 51 In TRC run, the standard deviation for Twist for newly laid track \_\_\_\_\_
- 52 In TRC run, the standard deviation for gauge for newly laid track is \_\_\_\_\_.
- 53 In TRC run, the standard deviation for alignment for newly laid track is \_\_\_\_\_.
- 54 In a TRC digital printout, the blocks where SD value for urgent maintenance is exceeded and where planned maintenance is exceeded are identified by \_\_\_\_\_ for Urgent maintenance.
- 55 In a TRC digital printout, the blocks where SD value for urgent maintenance is exceeded and where planned maintenance is exceeded are identified by \_\_\_\_\_ for Planned maintenance.
- 56 In a TRC digital printout, what do you mean by ALIL 13/85\_\_\_\_\_
- 57 In ballast testing, the maximum value of Abrasion test is \_\_\_\_ %.
- 58 In ballast testing, the maximum value of Aggregate impact test is \_\_\_\_ %.
- 59 In ballast testing, the maximum value of Water absorption test is \_ %.
- 60 In a non-transitioned curve, the length of transition is 14.6m on BG. What is the 14.6?
- 61 A layer of coarse material of specified quality, inter posed between ballast and sub grade laid for more stability of formation is called \_\_\_\_\_
- 62 The service life in terms of GMT of traffic carries for considering TRR on Bridge proper, approaches for all major bridge where bank height more than 4.0m, all tunnel, and their approaches shall be \_\_\_\_\_
- 63 The shape of transition curves on Indian Railways \_\_\_\_\_
- 64 On non-transitioned curve, Curve should be run up or run out on the \_\_\_\_\_

- 65 Shift of circular curve required in a non – transitioned curve is \_\_\_\_\_
- 66 The slew in any direction at a station affects the versines at adjacent station by \_\_\_\_\_
- 67 An extra clearance on the account of lean will be required on which side of curve \_\_\_\_\_
- 68 The normal position of B class LC with TVU < 25000 will be kept as \_\_\_\_\_
- 69 For testing of soil, sample should be collected at a distance of \_\_\_\_\_
- 70 Battering of a rail end is measured at a point \_\_\_\_\_ away from the rail end.
- 71 First coat of anti corrosive painting of rails shall be with \_\_\_\_.
- 72 Second and third coat of anti corrosive painting of rails shall be with \_\_\_\_\_, with a minimum dry film thickness of \_\_\_\_\_ for each coat.
- 73 Permitted shrinkage for wagon measurement of ballast, compared to stack measurement is \_\_\_\_\_.
- 74 Width of formation required for BG, LWR, single line track in cutting, and embankment is \_\_\_\_\_ respectively.
- 75 Sizes of square mesh sieves used for sieve analysis of ballast are \_\_\_\_.
- 76 Side slopes of ballast stack shall not be flatter than \_\_\_\_\_
- 77 Extension of guard rails beyond the face of ballast wall of bridge/tunnel in BG is \_\_\_\_\_
- 78 Mark III flot toe ERC exerts a toe load of \_\_\_\_\_
- 79 Toe load of ERC –J Clip \_\_\_\_\_.
- 80 Formation is classified as bad where either speed restrictions or No. of normal attentions to track in a year are \_\_\_\_\_, and as very bad if they are \_\_\_\_\_
- 81 For a given radius of curve,  $C_a$  &  $C_d$ , \_\_\_\_\_ permitted speed can be determined using the formula for BG, is \_\_\_\_\_
- 82 For BG, distance of banner flag and detonators with hand signals in case of works of short duration, from work site shall be \_\_\_\_\_ respectively
- 83 Second summation of versine difference at any station in curve re alignment represents \_\_\_\_\_ at that station
- 84 Minimum radius of centre line of road at an LC approach for a National/ State highway shall be \_\_\_\_\_ for plain terrain, \_\_\_\_\_ for hilly terrain
- 85 Maximum slinging distance for lifting of 90 UTS rails shall be \_\_\_\_\_, and maximum overhang shall be \_\_\_\_\_

#### True or False

- 1 ) Number of Xing is define as the cotangent of the Xing angle?  
(True/False)
- 2 ) In stub switch no separate Rail provided (True/False)
- 3 ) Resistance due to curvature =  $0.004WxD$ ,  $W$ = Load of the Train  
(True/False)
- 4 ) Lubrication of rail joints is preventive measure for low joints  
(True/False)
- 5 ) Block protection for rail dolly is mandatory if carried rail panel length more than 39mtr.  
(True/False)
- 6 ) Virtual switch entry angle shall be more than the switch angle in case of similar flexure  
(True/False)

- 7 ) Dye penetration test to be conducted for identifying the crack  
(True/False)
- 8 ) CWR continue through station yard including Pt.& Xing?  
(True/False)
- 9 ) correcting alignment through machine in design mode adopt? 3 point method  
(True/False)
- 10 ) TGI less than 36 means track required immediate attention?  
(True/False)
- 11 ) Maximum permissible cant for D route is 140mm? (True/False)
- 12 ) CRS sanction is mandatory for increase sectional speed? (True/False)
- 13 ) Stationery watch man to be posted in important Bridges?  
(True/False)
- 14 ) Distressing temperature kept slightly higher than mean temperature prevent the chances of buckling? (True/False)
- 15 ) The max. distance apart of trolly refuses shall not exceed 100 mts in case of tunnels.  
(True/False)
- 16 ) The easement gradient to be given during manual lifting of track for 25mm in 1mtr rail length for passage of trains. (True/False)
- 17 ) Spherical washers are to be provided on LH side invariably on for all types of turnouts.  
(True/False)
- 18 ) Tongue rails should be replaced/re conditioned when the Lateral wear 8mm for 60kg.  
(True/False)
- 19 ) Tongue rails should be replaced/reconditioned when the Vertical wear 8mm for 60kg.  
(True/False)
- 20 ) The max. permissible vertical wear on crossing is 10mm.  
(True/False)
- 21 ) Incase of CMS crossing the following dimensions should be deducted (on account of slope in casting of wing rails to (1in20 cant) is 2.5mmfor 52kg and 2.0mm for 60kg.  
(True/False)
- 22 ) The variation in versines on two successive stations in lead curve should not be more than 4mm . (True/False)
- 23 ) The PWI incharge and sectional PWI should carryout the insp. of P&C in passenger running lines once in six months by rotation except for group A&B routes.  
(True/False)
- 24 ) The verification and preparation of statements of infringements to standard dimensions to be done once in a year by PWI in his section. (True/False)
- 25 ) It is desirable to maintain correct uniform gauge of -6 to 15mm for curves with radius 350m or more. (True/False)
- 26 ) A run-off ramp of 1 in 1000 should be given before closing the day's work while closing on curves. (True/False)
- 27 ) In 3-tier system of track maintenance MMU-1 for each PWI's section and MMU-II for each sub-division. (True/False)
- 28 ) Sample of standard section of track should be maintained for two rail length at the junctions of gang jurisdiction. (True/False)
- 29 ) Points and crossings should be laid with 1 in 20 cant to maintain the correct slope to approach track. (True/False)
- 30 ) Turnouts with switches having switch entry angle less than or equal to 0° 20'00" should be maintained with Nominal gauge. (True/False)

- 31 ) Turnouts with switches having switch entry angle  $>0^{\circ}20'00''$  should be maintained with Nominal gauge +6mm. (True/False)
- 32 ) 1 in 8  $\frac{1}{2}$  T/outs should not be laid on inside of the curves (True/False)
- 33 ) In OMS-2000 run for high speed route if the number vertical and lateral peaks are 1 to 2 per km the track is considered as good. (True/False)
- 34 ) Where the level crossing is on a curve, the gate lodge should be built on out side of the curve. (True/False)
- 35 ) In case a rail dolly is to carry rails longer than 3rails panel or it is required to carry over X-Overs in yard crossing more than one line in deep cuttings and curves it should work under block protection. (True/False)
- 36 ) Initial testing of ERC in to be done after 4years or passage of 200 GMT which ever is earlier (True/False)
- 37 ) After initial testing of ERC subsequent testing will be done every 4 years or 200 GMT which ever is earlier. (True/False)
- 38 ) The toe load of elastic rail clip should be measured on 1% of ERC randomly or every 100 sleepers (all 4 ERCs to be measured on one sleepers (True/False)
- 39 ) If 20% or more of ERC sample size records the toe load below 400 kg. which is to be confirmed by 5% sample size, TFR should be proposed. (True/False)
- 40 ) Lubrication of ERC should be done once in a year in corrosion prone areas and platform lines and once in 2 years in other areas. (True/False)
- 41 ) If the average no. of peaks of vertical and lateral acceleration exceeding 0.30g is more than 0.25 per Km or more than 1 in any particular kilometer the track will need attention (True/False)
- 42 ) Cant excess causes flattening of rail head at inner rails in curves (True/False)
- 43 ) Cant deficiency causes wearing out of outer rail gauge face in curves (True/False)
- 44 ) Limiting values for cant deficiency are based on comfort levels of unbalanced lateral acceleration (0.4m/Sec<sup>2</sup>) (True/False)
- 45 ) Versines of turnout and turn in curves shall be recorded at 3m interval and 6m chord length. (True/False)
- 46 ) An electrical equipment is considered as dead and only power line or cable shall be regarded live. (True/False)
- 47 ) Defects in structure bond to be reported to TPC by OHE staff only. (True/False)
- 48 ) Structure bonds are required in A.C. only. (True/False)
- 49 ) The tree having trunk & branches at a distance of 3.90m from OHE wire not necessary to cut. (True/False)
- 50 ) The Engg. Department is responsible for cutting of branches with in 04 metres distance from live OHE. (True/False)
- 51 ) Steel tapes are not permitted in track circuited areas . (True/False)
- 52 ) For intermediate tracks on triple or multiple lines, engineering indicators should be fixed between track within 300mm from rail level. (True/False)
- 53 ) Slip sidings are provided where gradient is steeper than 1 in 80. (True/False)
- 54 ) Medical category of Machine operator is A3 category. (True/False)
- 55 ) Any additions, extensions or alterations to all running lines required CRS sanction. (True/False)
- 56 ) Alterations to points and crossing in both running and Non-running lines require CRS sanction. (True/False)
- 57 ) Construction of new stations require CRS sanction . (True/False)

- 58 ) Permanent diversion more than 2Km. in length without any station in between require CRS sanction. (True/False)
- 59 ) Removal of an ashpit from running line require CRS sanction. (True/False)
- 60 ) Regarding of running lines involving lowering/raising of track in excess of 300mm require CRS sanction. (True/False)
- 61 ) Temporary diversion irrespective of length require CRS sanction. (True/False)
- 62 ) Level crossing should not fall with in the breathing length of LWR (True/False)
- 63 ) All level crossings must be provided with wicket gates (True/False)
- 64 ) Normal position of a "B" class L.C need not be always "open to Road traffic" (True/False)
- 65 ) Speed in excess of 15KMPH can be permitted on running loops with wooden sleepers. (True/False)
- 66 ) Speed in excess of 15KMPH can be permitted only on turnouts with PSC sleepers. (True/False)
- 67 ) Speed in excess of 15KMPH can be allowed on running loops with a minimum track structure of 90R SWR with PSC/ST/CST-9 sleepers of M+4 density and 150mm ballast cushion out of which minimum 75mm is clean cushion (True/False)
- 68 ) Speed in excess of 15KMPH on turn in curves can be permitted with any sleeper. (True/False)
- 69 ) For speed in excess of 15KMPH minimum track structure on T.I.C ie., that it has rails with same rail section of turnout with PRC/ST/CST9 sleepers with a maximum sleeper from C/c of sleeper 65 cm and radius of curvature on T.I.C is more than the radius of curvature on turn out. (True/False)
- 70 ) The rail joints to be lubricated once in a year after the monsoon. (True/False)
- 71 ) The ADEN should inspect all the manned level crossings once in a year (True/False)
- 72 ) The PWI in-charge of the section should inspect the entire jurisdiction by push trolley once in fortnight. (True/False)
- 73 ) Trolley refuses should be provided on bridges with main spans of less than 100mts is at every 100mts . (True/False)
- 74 ) Gauge should maintain on straight track uniformly to -6mm to +6mm (True/False)
- 75 ) Gauge should be maintained uniformly on curves with radius 350m or more is upto +20mm. (True/False)
- 76 ) CRS Sanction is required for on-track machine before introducing in section (True/False)
- 77 ) Lifting of track should commence from the up hill end carried out in the direction of falling grade in case of single line (True/False)
- 78 ) Fouling marks should be fixed at the points at which the spacing between tracks begin to reduce less than the minimum. (True/False)
- 79 ) Green mark to be painted at ends for class-1 rails. (True/False)
- 80 ) Yellow mark to be painted for class-II rails. (True/False)
- 81 ) T-12 Rails stands for FIRST QUALITY RAILS. (True/False)
- 82 ) The permissible speed over I in 12 Turnout with curved switch is 30KMPH (True/False)
- 83 ) Speed in excess of 15kmph should not be permitted on turn-in curves laid with PSC Sleepers. (True/False)
- 84 ) Extra shoulder ballast should be provided on out side of the turn-in curve (True/False)

- 85 ) The limit of station to station versine variation in curves is 10mm or 25% of the average versine on circular curve whichever is more in speed range of 120kmph and above. (True/False)
- 86 ) The limit of station to station versine variation in curves 15mm or 25% of the average versine on circular curve whichever is more in speed range below 80kmph. (True/False)
- 87 ) The limit of station to station versine variation in curves 40mm or 25% of the average versine on circular curve curve whichever is more in speed range below 80kmph and upto 50kmph. (True/False)
- 88 ) Wear on outer rail of curves can be reduced by reducing the speed of trains (True/False)
- 89 ) The wear of rails of curves having radius of 600m or less on BG shall be periodically recorded. (True/False)
- 90 ) During welding the rail ends are heated only upto 950°C (True/False)
- 91 ) Major lifting ,D/Screening etc shall be done when rail temp is below  $t_m + 15^\circ\text{C}$  in Zone I and II. (True/False)
- 92 ) In zone II , the range of temperature is  $51-60^\circ\text{C}$ . (True/False)
- 93 ) In TGI calculations the majority of peaks goes to alignment (True/False)
- 94 ) The frequency of recording of TRC for routes with existing speeds above 130kmph is once in 2 months (True/False)
- 95 ) In high speed routes where the peaks recorded less than 1.0 the track will be classified as good. (True/False)
- 96 ) In high speed routes when the peaks recorded more than 2.0 the track will be classified as average. (True/False)
- 97 ) The aim of providing fencing parallel to road at LCs upto height gauge in electrified area not to cross a vehicle between track to height gauge (True/False)
- 98 ) The height of chain with stop board to be provided min.1m height when gate barrier is damaged. (True/False)
- 99 ) The check on patrolling by sectional PWI is once in a month. (True/False)
- 100 ) Patrol chart will be issued by Divl.Engineer. (True/False)
- 101 ) No cant is to be provided on P & C. (True/False)
- 102 ) If a patrolman on the arrival at the end of his beat does not find the next patrolman he should still continue patrolling as per petrol chart? (True/False)
- 103 ) When no danger is apprehended the patrolman should stand on the cess on the right hand side facing the train and exhibit his number plate. (True/False)
- 104 ) The RAT which still requires heavy repairs despite repeated reminders by Railway should be considered and included in the list of vulnerable locations (True/False)
- 105 ) In case of an emergency the patrolling of track can be commenced by Gang Mate (True/False)
- 106 ) If conditions warrant to stop a train at the site the Driver should be advised through written memo. (True/False)
- 107 ) Caked cushion below sleeper causes increase in rail fractures. (True/False)
- 108 ) The formation should be cut suitably to provide full cushion (True/False)
- 109 ) Works of short duration are the works which can be completed by sun-set and no SR there after is required. (True/False)
- 110 ) The permanent indicators should be lit at night as in the case of temporary indicators. (True/False)

- 111 ) Level crossing over colliery, factory and other similar sidings where Railway traffic is light may be commissioned without consulting CRS. (True/False)
- 112 ) In case of an emergency the Gateman can leave his Gate by keeping any other known person at gate. (True/False)
- 113 ) Minimum length of check rail for square crossing should be 3 Mtr more than the Gate. (True/False)
- 114 ) At all interlocked Points, the Signal staff will be responsible for periodical cleaning and lubrication of all the slide chairs in the switch portion. (True/False)
- 115 ) At interlocked/non-interlocked Level crossings, sanction of CRS shall be required for providing lifting barriers in place of leaf/swing gates. (True/False)
- 116 ) Maximum Center to Center spacing of steel channel sleepers for BG is 740 mm. (True/False)
- 117 ) The recommended minimum depth of ballast cushion for group-'A' BG track is 300 mm. (True/False)
- 118 ) Where ever primary renewals are carried out even on "E" routes, the minimum depth of ballast cushion shall be provided is 150 mm. (True/False)
- 119 ) The minimum rank of Supervisor for Rail dolly working is Gang Mate (True/False)
- 120 ) The periodicity of distressing of LWR/CWR track has been fixed as 2 years (True/False)
- 121 ) Lifting of track should be done in the opposite direction to traffic ((True/False)
- 122 ) Spacing should be marked on outer rail of the curve for giving sleeper spacing ((True/False)

**Short answer Questions:**

- 1 How would you distinguish between 1 in 8½ curved switch & 1 in 12 straight switches available in the yard on cess for a tongue rail length of each is 7.62m.
- 2 While measuring wear on CMS crossings 2mm. or 2.5mm to be deduced from the measured wear. why?
- 3 Why chamfering of bolt holes should be done ?
- 4 Why 2 meters distance required from live parts of OHE ?
- 5 Why cross bonds (D.C) provided between adjacent tracks?
- 6 What is the main idea behind providing structure bonds ?
- 7 The insulated joints are preferable in square than staggered why ?
- 8 Where curve boards to be fixed ?
- 9 Why the breathing length of LWR/CWR should not fall within the level crossings ?.
- 10 The minimum length of bridge timber on girder bridges with BG route is out side to outside girder flange +305mm (Subject to minimum 2440mm), why 305mm addition on both sides required?
- 11 Why the stock rail should be bent for the straight curved switches at TTS having switch entry angle more than 0° 20' 00" ?
- 12 What is the relation between longitudinal profile of rail and camber provided on a bridge ?
- 13 Why hook bolts to be used in the girder bridges ?
- 14 When the staggered for fish plated joints to be provided for curves?
- 15 Where & Why catch sidings is provided?
- 16 Why check rails are provided in the xing assembly zone ?
- 17 The length of each Monsoon patrol beat should not normally exceed 5Km, why?
- 18 Where the skew level crossing are unavoidable the angle of crossing should not less than 45°, why ?
- 19 What is the play of wheels on a straight track and how ?
- 20 Why fan shaped PSC turn outs are designed with 1673mm gauge?
- 21 How to achieve the gap less fish plated joint at CMS crossing in the points & crossing?
- 22 In what condition of E.R.C proposal for "Through Fastening Renewal" is to be done?

- 23 In which period lubrication of E.R.C's should not be done?
- 24 For lubrication of E.R.C's IS specification of grease Graphits is?
- 25 What is frequency of lubrication of E.R.C?
- 26 What is "A" class level crossing?
- 27 Which class of level crossings are to interlocked and protected with signals and kept normally open to road traffic?
- 28 On a curve where curve board is to be provided and what data must be available on curve board?
- 29 What is desirable length of transition curve, if "L" is length of curve "Ca" is actual cant, Cd is cant deficiency and Vm is the maximum permissible speed in KMPH?
- 30 "What is equilibrium speed?
- 31 What is degree of a curve ?
- 32 What is the precaution prescribed for all flat top, arch and prestressed concrete girder bridges with deck slab where guard rails are not provided?
- 33 Why elongated holes should not be chamfered?
- 34 What is inspection scheduled for visual examination of rail ends on important girder bridges and approaches?
- 35 What are repressed fish plates and what for they are used?
- 36 When buckling of track occurs?
- 37 in a diamond crossings how obtuse crossings are located with respect to acute crossings?
  
- 38 What is the size of letter on T/P and T/G Boards?
- 39 What is the length and breadth of a caution indicator?
- 40 Why the approach sleepers in advance of Switch portion and behind the crossing portion should be provided without fail ?
- 41 What is the heel divergence of 1 in 8½ and 1 in 12 curved PSC layout?
- 42 Which joints in a turnout are desirable to be made gap less ?
- 43 What is the service limit for station to station variation of Versine on route of speed range below 120 Km/h and upto 80 Km/h
- 44 What is the sleeper spacing at fish plated joint shall be kept where concrete sleepers used in yards with fish plated track and what additional precautions to be provided at such joints.
- 45 What is the remedial measures suggested for strength failure below ballast causing heaving of cess or between sleepers?
- 46 Where is the exact location of JOH in Switch Portion of Pts & Crossings ?
- 47 At what condition the tongue rail is required to be replaced ?
- 48 On what basis the routes of IR is classified ?
- 49 What should be the height of gate boom from the road surface ?
- 50 What is the time for proposal for TFR?
- 51 What is the frequency of lubrication of ERCs to be done in Corrosion prone areas and platform lines?
- 52 In fan shaped layouts the sleeper rounded marking should kept on which side for LH or RH T/outs?
- 53 When the two insertions are required for PSC sleepers track?
- 54 What is the period for systematic attention shall be given to PSC track?
- 55 What is the range of temp for doing regular track maintenance?
- 56 What is the schedule of inspection of PWI attached to ART?
- 57 What is the classification of track if peaks are more than two in high speed route?
- 58 What is the min distance maintained to erect the height gauge from the nearest center line of track?

- 59 What is the speed restriction is required for LCs when check rail is not provided?
- 60 What is the walking speed of the patrolman?
- 61 What is the schedule of night patrolling inspection of sectional PWI by train/trolley?
- 62 What is the periodical deep screening of normal track?
- 63 What application is required after making hole to rail before put into track?
- 64 What is the overhauling of track ?
- 65 What is the periodicity of overhauling on track ?
- 66 While lifting of sags, lifts to be given after plotting long levels on graph sheet and marking should be given accordingly. Can we do the same by the eye judgment?
- 67 What is the use of spherical washers on Points & Crossings and indicate the location where they are to be provided in switch & X-ing portion.
- 68 What is the turn in curve & specify the track structure on turn in curve?
- 69 What is the preferable gauge just a head of actual toe of switch?
- 70 Why bend to be given at the TTS on T/out side stock rail?
- 71 The variation in versine on two successive stations in lead curve and turn in curve portion should not be more than 4 mm and versine at each station should not be beyond  $\pm 3$  mm from its designed value . What will be the cause of variation?
- 72 What is the cause and remedy for flattening of rail table caused due to over loading on one rail?
- 73 What is the testing frequency of ballast while supplying?
- 74 Why priority should be given to attend alignment and unevenness in view of improvement of TGI.
- 75 What is spring setting device and where it will be provided?
- 76 What is the slew at the last station of a curve if second summation of versine difference is +205 and second summation of correcting couple is -205?
- 77 What is the permissible super elevation on a temporary diversion provided in case of emergency?
- 78 What is the inspection frequency of a PWI not in over all charge for night patrolling?
- 79 What is the inspection frequency of a PWI for night patrolling?
- 80 Initial testing for toe load of ERCs to be done after corrosion prone area
- 81 Why permissible speed on 1 in  $8\frac{1}{2}$  symmetrical split turn out increased to 30 kmph where as on 1 in  $8\frac{1}{2}$  LH/RH T/O is 15 kmph?
- 82 Why 1st summation of versine difference ? ( $V_p - V_e$ ) at last station of a curve should be zero?
- 83 Cross level at A is 5 RL, XL at B = 4LL the length between A and B is 3m. What will be twist?
- 84 Why centre of checkrail should be placed opposite to ANC?
- 85 How is the battering of rail ends measured ?
- 86 What is corrugation or roaring rails ?
- 87 What is the torque force applied for chamfering of bolt holes ?
- 88 In case of deep screening, assesment of ballast required for recoupment and providing standard section. What is the procedure to be adopted ?
- 89 What is the method of testing the detonators ?
- 90 What is the criterion of units to be taken for TVU ?
- 91 What is the indication if wing rails or check rails which are badly wornout laterally ?
- 92 What is the reason for deduction of dimensions from vertical wear at nose in case of CMS crossings from observed measurements to find out the actual wear ?
- 93 What is the necessity reason for deep screening of track ?
- 94 What is the reason for lubrication of rail joints ?
- 95 What is the reason for flattening of rail table on the inner rail of a curve ?

- 96 What is the reason for indicating an arrow mark chiselled on the top of the hook bolts on girder bridges ?
- 97 What is the reason for staggering of rail joints should be done on sharp curves less than 400 mtrs ?
- 98 What is the reason for providing check rail on the in side of the inner rail of the curve on sharp curves ?
- 99 A temporary diversion is that which is not likely to be use for not more than?

## LWR Manual

### Objective Type

- 1 Competency certificate for LWR maintenance is issued by  
a)DEN                      b)AEN                      c)PWI                      d)CE
- 2 Minimum supervisory level for routine track maintenance on LWR is  
a)PWI-III                      b)Key man                      c)Mate                      d)PWM
- 3 The breathing length of LWR exhibits movement of -  
a)Rail sleeper frame                      b)Rail alone  
c)Sleeper alone d)Rail & sleeper both
- 4 The destressing temperature for a LWR with 52 Kg rail is  
a)tm to tm-5°                      b)tm to tm +5 °  
c)tm +5 ° to tm+10 °                      d)tm-5 ° to tm -10 °
- 5 Maintenance operation in a LWR should be restricted to a temperature range of  
a)td +10 ° to td-30 °                      b)td +5 ° to td -25 °  
c)td to td-20°                      d)td+10 ° to td-20 °
- 6 While doing deep screening in LWR territory, if the rail temperature is anticipated to rise above td+10° C , action to be taken is  
  
a)Stop the work                      b)Cut the LWR  
c)do a temporary de stressing at 10 ° C lower than maximum anticipated rail temperature  
d)Continue the work
- 7 While repairing a fracture in which a gap 'g' has been created and paint marks made at a distance of 'a' and 'b' from the fractured rail ends, the following relationship should hold good if a closure rail piece of length 'l' is inserted  
a)a+b+1mm = 1+(2x25mm)                      b)a+b+g+1mm = 1+(2x25mm)  
c)a+b+1mm = 1+(2 x25mm)-g                      d) a+b = 1mm+1+(2x25mm)
- 8 While continuing the a LWR over a girder bridge, the rail sleeper fittings should be-  
a)rail free type                      b)rigid type                      c)two way keys                      d)hook bolts
- 9 Gap survey of a SWR has to be done  
a)Just before the monsoon  
b)just after the monsoon  
c)before the onset of the summer season in Feb/March                      d)regularly
- 10 The distressing of LWR by tensor can be done when temperature prevailing (tp) is-  
a)More than td                      b)less than td  
c)equal to td                      d)When td+5°C
- 11 If the temperature rises above td+20°C ,hot weather patrolling can be started by  
a)PWI-III                      b)Key man                      c)Gang mate                      d)PWM
- 12 In a yard with LWR, for track circuiting make use of-  
a)insulated block joints                      b)glued joints of G3L type  
c)cut the LWR into SWR                      d)Cut the SWR to single rail

- 13 SEJ are inspected by the PWI/APWI once-  
a)every 15 days  
b)every 15 days in the two hottest and two coldest months of the year and once in 2 months in remaining period  
c) every 7 days d)every 30 days
- 14 At a SEJ theoretical calculations of movement of one LWR end indicates an expansion of 4mm and a contraction of 3mm during falling and rising temperature trends, respectively. If the standard gap at td is 20mm what range of gap is permissible as per LWR manual  
a)23mm to 16mm b)33mm to 6mm  
c)3mm to 4mm d)33mm to 16mm
- 15 The periodicity of distressing of LWR has been fixed as-  
a)once in 3 years b)once in 5 years  
c)once in 10 years d)none of the above
- 16 LWR plans to be approved by  
a) SrDEN b)SrDEN/(Co) c)PCE d)CTE
- 17 Authority to approve plans for continuation of LWR through points and crossings  
a)RDSO b)CTE c)PCE d) Rly board
- 18 Isolation of LWR with points and crossings on PSC layout to be done by providing  
a)Single rail length b)Three Nos. of single rails  
c)Two Nos of three rail panels d)One No of three rail panel
- 19 LWR plan horizontal scale is  
a)1:100 b)1:1000 c)1:50 d)1:5000
- 20 Factor affecting ballast resistance  
a)Consolidation b)Sleeper density  
c)Destressing temperature d)Prevailing temperature
- 21 In rail temperature map, readings outside the bracket indicate.  
a)Annual mean temperature b)ambient temp  
c)range of rail temp d)Destressing temp
- 22 In rail temp. map, readings inside the bracket indicate  
a)Annual mean temperature b)ambient temp  
c)range of rail temp d)Destressing temp
- 23 Factors affecting breathing length in LWR are  
a)Zone , sleeper density b)sleeper density, rail section  
c)rail section, zone d)time of laying , zone
- 24 Breathing length of LWR can be expressed as  
a) $AE a v tr/2R$  b) $AE art/2R$  c) $AE a Tr/2R$  d) $AE a t/R$
- 25 While permitting LWR on bridges, SEJ(with maximum movement of 120mm and 190mm) to be installed at \_\_\_\_\_Mtr distance from the abutment  
a)10 b)15 c)39 d)13
- 26 Rail Temperature range from zone -I to IV  
a)Increases b)decreases  
c)depends upon cambient d)temperature

- 27 Total No of ref mark provided for an LWR  
a)10 b)12 c)14 d)8
- 28 Main factor effecting hysteresis of LWR track is  
a)Rail section b)Prevailing rail temp  
c)Type of sleeper d)Longitudinal ballast resistance
- 29 Heaping up of ballast in the bridge approaches starting from the foot of the rail to be done for a length of \_\_\_\_\_m on both approaches  
a)39 b)13 c)50 d)52
- 30 LWR/CWR may be continued upto a single span of girder of \_\_\_\_\_Mtr with in Zone-III  
a)45.7 b)16.83 c)8.7 d)7.5
- 31 Maintenance temperature of SWR in zone -III for track where  $R < 875m$  is:-  
a) $T_m + 5^\circ C$  b) $T_m + 20^\circ C$  c) $T_m + 10^\circ C$  d) $T_m + 15^\circ C$
- 32 In plotting hysteresis loop the magnitude of the ballast resistance opposing the reverse movement value is reckoned as  
a)R b)2 R c) $R^2$  d) $2R^2$
- 33 On Indian Railway generally the maximum value of gap at a rail fracture in LWR is considered as \_\_\_\_\_mm  
a)25 b)75 c)50 d)40
- 34 To keep the gap at fracture on approach of bridge minimum to 50mm overall length of bridge where LWR can be continued as per LWR manual with rail free fastenings on LWR on girder bridge is \_\_\_\_\_ mtr  
a)45 b)50 c)20 d)305
- 35 Number of buffer rails to be provided for zone-III in Indian Railways  
a)2 b)3 c)4 d)1
- 36 The initial gap to be provided at each buffer rail joint in LWR track is \_\_\_\_\_is  
a)6.5 b)5 c)7.5 d)3
- 37 Where buffer rail gap is 15mm at temp higher than  $t_d - 30^\circ C$  in zone-III it indicates  
a)Defective initial gap b)creep of LWR  
c)inadequate packing in breathing length d)all the above
- 38 Max over all length of bridge permitted on LWR/CWR in case of zone-III for 60Kg rails with rail free fastenings is \_\_\_\_\_  
a)33 b)20 c)11 d)25
- 39 General lift allowed on concrete sleepers track while doing machine tamping in LWR track is \_\_\_\_\_mm  
a)25 b)50 c)75 d)no lifting allowed
- 40 Greasing of SEJ by K/man to be done \_\_\_\_\_  
a)Monthly b)weekly c)everyday d)fortnightly
- 41 Replacement/repairs and adjustments of fastenings or clearances at the SEJ should be done when rail temperature is less than  
a)  $t_d - 5^\circ C$  b) $t_d + 10^\circ C$  c)at falling temperature d)no relation with  $t_d$

- 42 While marking reference line on reference post after initial laying of SEJ the reference line must coincide with.  
a) centre of gap at SEJ  
b) tip of tongue rail  
c) half of the theoretical gap at the time of laying of SEJ  
d) mean position of the stock rail
- 43 The gap between the reference mark and stock rail corner at various rail temperatures shall not differ by more than \_\_\_\_\_mm from the theoretical range  
a)  $\pm 15$  b)  $\pm 10$  c)  $\pm 20$  d) No variation allowed
- 44 While joining LWRs into CWR number of blocks required  
a) 2 b) 3 c) 4 d) 5
- 45 Distressing of LWR/CWR to be done when the number of locations where temperature repairs have been done exceeds \_\_\_\_\_KM  
a) 3 b) 4 c) 1 d) 5
- 46 Spacing of central sleepers of SEJ should not differ by more than \_\_\_\_\_mm over the standard \_\_\_\_\_mm  
a)  $\pm 10,650$  b)  $\pm 20,650$  c)  $\pm 10,700$  d)  $\pm 20,700$
- 47 LWR is permitted in zone I with radius upto \_\_\_\_\_metres  
a) 400 b) 360 c) 350 d) 300
- 48 While providing welded rails on girder bridges between pier to pier with railfree fastenings and with SEJ on each pier and girder supported on sliding bearings on both ends, number of sleepers to be box anchored in the central portion of the welded rails over each span \_\_\_\_\_  
a) 4 b) 5 c) 6 d) all the sleepers
- 49 Continuation of LWR is restricted for a certain length of girder bridge  
i) Due to excess gap created on approaches If a rail fracture occurs  
ii) If on formation where no bridge gap due to fracture =  $2AE(\Delta t)^2/2R$  gap =  $2AE(a t)^2/2R + L \& t$  Where L = length of bridge  
iii) gap is directly proportional to the over all length of girder bridge.  
a) All the above b) one of the above  
c) i) and ii) only d) ii) and iii) only
- 50 What is the % of reduction of ballast resistance on LWR track after one round of T/packing for concrete sleepers  
a) 23% b) 33% c) 15% d) 40%
- 51 What is the % of reduction of ballast resistance on LWR track after one round of T/packing for conventional sleepers  
a) 36% b) 23% c) 30% d) 40%
- 52 The maximum length of LWR under Indian conditions is restricted to  
a) one block section b) 3 Kms c) 1 Km d) 200m
- 53 LWR/CWR shall not be laid on curve sharper than \_\_\_\_\_ Mtr Radius on BG  
a) 440 b) 400 c) 360 d) 875

- 54 Bridges on which LWR/CWR is not permitted shall be isolated by a minimum length of \_\_\_\_\_ mm either side  
a)36 b)13 c)42 d)50

55 Regular track maintenance in LWR/CWR shall be done at a rail temperature in between  
a)((td + 10°C) and (td - 30°C) b)(td + 20° & td -10°)  
c)(td + 30° & td 50°) d)None

56 On a LWR/CWR curved track with cushion of 300mm, quantity of ballast requirement is \_\_\_\_\_ CUM/Mtr of track  
a)2243 b)2 c)25 d)3243

57 Cross slope on formation top for LWR / CWR track should be \_\_\_\_\_  
a) 01 in 40 b)1 in 30 c)1 in 20

58 SEJ with straight tongue & stock shall not be located on curves sharper than \_\_\_\_\_  
a)0.5" b)1° c)2°

59 LWR/CWR may be continued through reverse curves not sharper than \_\_\_\_\_Mtr radius  
a)875 b)1750 c) 440 d)3500

60 For reverse curves sharper than 1500 mtr Radius, shoulder ballast of \_\_\_\_\_ mm over a length of 100 mtr On either side of the common point should be provided  
a)600 b)300 c)450 d) 500

61 In case of double line BG curved LWR / CWR track Bank / cutting width should be increased by \_\_\_\_\_ mm on the out side of the curve  
a)300 b)450 c)600 d) 500

62 Minimum radius of the vertical curve for Gr'B' routes is \_\_\_\_\_ Mtrs  
a)3000 b)6000 c)4500 d) 500

63 Deep screening of LWR may be done without cutting or temporary distressing at a rail temperature of \_\_\_\_\_  
a) (t d + 10° c) to (t d - 20° C) b) (td + 20° to td-20°)  
c) (td + 10°) to (td-10°)

64 LWR/CWR can be laid on vertical curve where algebraic difference between two grades is \_\_\_\_\_mm/Mtr  
a)4 b)2 c)3 d)1

65 For consolidation of track in case of using hand operated compactors / consolidations on BG, passage of minimum gross tones of traffic required is \_\_\_\_\_ tonnes  
a)3,00,000 b)4,00,000 c)2,00,000 d) 1,00,000

66 Percentage reduction of maintenance cost by eliminating rail joints by introducing LWR is \_\_\_\_\_  
a)25 to 33% b)30 to 33% c)33% to 40% d)40% to 45%

67 Lubrication of buffer rail joint in LWR is done in between temperature range of  
a)' (t d + 15° C) to (t d - 15° C) b) (t d + 10° C to t d - 10° C) c) (t d + 20° C to td - 20° C)

68 Temporary distressing during deep screening on LWR is done at a temperature below maximum rail temperature :  
a)20° C b)15° C c)10° C d)5° C

- 69 Standard expansion gap at the buffer rail joint in LWR should be —mm  
a)5.5 b)6.5 c)7.5 d)8
- 70 Longitudinal ballast resistance in LWR does not depend on  
a)Type of sleeper b)Ballast profile c)Ballast consolidation  
d) Age of sleeper
- 71 Hot weather patrolling in LWR can be introduced by  
a) AEN b) PWI c)Mate d)SrDEN
- 72 In LWR track following work is not covered under “Regular track maintenance while considering the need of requisite consolidation before having unrestricted speed :  
a) Machine packing b) Shallow screening  
c) Manual packing d) Destressing
- 73 Which of the following thermometer attains the rail temperature quickly?  
a) Embedded type b)Dial type c) Digital type
- 74 To arrive mean rail temperature (t m) how many years of maximum & minimum temperature to be considered?  
a)4 years b)5 years c) 6 Years d) 10 Years
- 75 Modulus of elasticity of rail steel is ———Kg/Sqcm  
a)  $21.5 \times 10^5$  b)  $1.152 \times 10^5$  c)  $2.15 \times 10^6$
- 76 New constructions/doublings / gauge conversions/diversion shall be opened with ———  
a)Fishplate b)SWR c)LWR/CWR
- 77 The ballast section & cushion provided for LWR/CWR shall be continued upto ——— when followed by SWR track  
a)SEJ b) Breathing length  
c) Over SEJ & upto 3 rails beyond it
- 78 The minimum sleeper density for zone – II for PSC sleeper is  
a)1310 b) 1540 c)1660 d)1818
- 79 Speed restriction for destressing work in LWR should be———KMPH  
a)20 b)30 c)45 d) one of above
- 80 If rail temperature after maintenance operation exceeds (t d + 20° C), speed restriction to be imposed during the period of consolidation for a steel track having LWR/CWR should be ——— KMPH  
a)20 b)30 c) 40 d) 50
- 81 After temporary distressing deep screening can be done for ——— days if rail temporary is varying ?  
a) 10 b)15 c) 20 d) 30
- 82 Minimum level of supervision in case of emergency repairs for a buckled LWR track –  
a) Hot weather patrolman b) Mate c) PWM d) PWI
- 83 Speed restriction after completion of machine working should be imposed as per new Provisions?  
(a) 30 (b) 45 (c) 60
- 84 In which temperature Zone the maximum part of WAT division falls?  
(a) Zone-II (b) Zone-I (c) Zone-III (d) Zone-IV

- 85 The steepest permitted grade for LWR shall be \_\_\_\_\_  
 (a) 1 in 100 (b) 1 in 150 (c) 1 in 200 (d) 1 in 400
- 86 The min radius of the vertical curve shall be kept \_\_\_\_\_ mtr for ' A ' group route for BG  
 (a) 4000 (b) 3000 (c) 2000 (d) 3500
- 87 Where speed is higher than 130 kmph the min cushion on LWR track should be \_\_\_\_\_ mm  
 (a) 300 (b) 250 (c) 200 (d) 350
- 88 Min. rail section for forming LWR is \_\_\_\_\_.  
 (a) 90R (b) 52 Kg (c) 60 kg
- 89 During machine packing a general lift in LWR/CWR track should not exceed \_\_\_\_\_ mm in case of PSC sleepers  
 (a) 50 (b) 40 (c) 25 (d) 75
- 90 More than 30 sleepers up to 100 sleepers can be tracked when the temp ranges bet Td-30 °C to Td+10 °C and work should be taken up under direct supervision of  
 (a) PWI (b) APWI (c) PWM (d) Mate
- 91 Whenever rail renewal is due and to be carried out shortly, LWR/CWR may be cut and converted in to \_\_\_\_\_ for work of deep screening  
 (a) 3 RP (b) SR (c) 5 RP
- 92 Deep screening on LWR may be done from \_\_\_\_\_ end  
 (a) One end to other (b) Centre towards either end
- 93 During the rectification of rail fracture / weld failure preferably the min \_\_\_\_\_ metre length of rail is required for permanent rectification  
 (a) 6.50 (b) 4 (c) 6 (d) 13
- 94 The certificate of competency issued by divisional or zonal training centre shall be valid for \_\_\_\_\_ years from date of issue  
 (a) 3 (b) 5 (c) 2 (d) 4
- 95 When temperature range exceeds the limits Td+20 °C during maintenance period watchman \_\_\_\_\_ should be posted  
 (a) Mobile (b) stationery (c) None
- 96 Longitudinal ballast resistance for the PRC sleepers for density 1660 sleepers/Km is \_\_\_\_\_ Kg/Cm/Rail  
 (a) 1374 (b) 60 (c) 30 (d) None of above
- 97 In SWR track, no fish plated joint should be located on the girder or within \_\_\_\_\_ m from either side  
 (a) 6 (b) 4 (c) 13 (d) 65
- 98 Girder bridges on which LWR/CWR is not permitted shall be isolated by a minimum length of \_\_\_\_\_ m well accored track on either side  
 (a) 36 (b) 39 (c) 13 (d) 50

- 99 Track on girder bridges with standard single rails should be isolated from SWR on approaches by at least \_\_\_\_\_ numbers of well anchored rail lengths  
a) 2 b) 3 c) 5 d) 11
- 100 Proper consolidation is required between two stages if general lift exceeds \_\_\_\_\_ mm in case of concrete sleepers during lifting of LWR track  
a) 50 b) 40 c) 75 d) 100
- 101 Key man can supervise the work of fastenings renewal when there is no requirement of lifting and at least \_\_\_\_\_ nos of sleepers in between shall be kept intact  
a) 30 b) 50 c) 100 d) 40
- 102 Initial gap of SEJ for 60 Kg & 52 Kg rail at distressing temp —mm  
a) 40 b) 50 c) 60 d) 30
- 103 The supervision can be done by \_\_\_\_\_ if the fastenings being renewal / recouped by requiring lifting  
a) Mate b) PWM c) Key man d) Gangman
- 104 When creep in the fixed portion of LWR/CWR exceeds \_\_\_\_\_ mm full investigation shall be carried out  
a) 20 b) 10 c) 30 d) 25
- 105 The creep of LWR to be measured at the interval of \_\_\_\_\_ m on the curves sharper than 360m radius  
a) 50 b) 30 c) 20 d) 25

**Fill in the blanks:**

- 1 Deficiency of ballast on LWR track during summer may result in \_\_\_\_\_
- 2 Mate can supervise the work on LWR track but he must be possessed with the \_\_\_\_\_ on LWR track
- 3 \_\_\_\_\_ must be carried out after completion of work of TFR (distressing/ deep screening)
- 4 The use of ineffective fastenings resulting in loss of \_\_\_\_\_ and \_\_\_\_\_ resistance
- 5 During cold weather patrolling, patrolman should look out for \_\_\_\_\_

**True –False questions:**

- 1 LWR/CWR can be continued over bridges without bearings like slabs, box culverts and arches (True/False)
- 2 Welded rails may be provided from pier to pier with rail free fastenings with SEJ on each pier The rail shall be box anchored on four sleepers at the centre if the girder is supported on rollers on one side and rockers on either side (True/False)
- 3 For sleeper density of 1200 to 1500 /Km ballast resistance /unit length remains constant (True/False)
- 4 Longitudinal ballast resistance depends on type of sleeper (True/False)
- 5 One round of DTS working is sufficient for consolidation on PSC sleeper track (True/False)
- 6 In single line section the tongue rail of SEJ should face the direction of heavier traffic (True/False)

- 7 While laying SEJ end point of tongue rail must be coincide with the mid portion of the central bolt (True/False)
- 8 LWR/CWR shall not be laid normally on curves sharper them 440 m radius of curve (True/False)
- 9 The steepest permitted grade shall be 1 in 100 for LWR (True/False)
- 10 CWR can be made through points & Xing's as per new standards (True/False)
- 11 For 52 Kg /60 Kg rail SEJ gap shall be provided 40 mm always while installation (True/False)
- 12 To calculate side rollers numbers to be provided on curve during distressing is  $n = (R \times \text{No of sleeper per rail})/50$  (to-tp) (True/False)
- 13 If there is shortage of ballast in shoulders the gang mate shall make out the Shoulders by taking the ballast from centre of track not exceeding the width Of 600 mm & depth 100 mm for BG(True/False)
- 14 If the rail temp falls with in the maximum  $T_d + 10^\circ \text{C}$  and min  $T_d - 30^\circ \text{C}$  the sleeper spaces upto 100 sleepers can be opened with out supervision of PWI (True/False)
- 15 For the maintenance work temporary distressing should be done ie valid for more than 15 days (True/False)
- 16 For temporary ratification of rail fracture or weld failure the min length of 650 mtr Rail can be used(True/False)
- 17 The over all reason of buckling is lack of sufficient resistance in the track to resist The forces produced in LWR (True/False)
- 18 LWR/CWR shall not be laid on curves sharper than 400 m Radius in case on BG (360 m Radius) (True/False)
- 19 LWR/CWR may continued through reverse curve not sharper than 875 m Radius (True/False)
- 20 Special arrangements of provision of ballast of 600 mm to be made up to 100 mm On either side of common point on reverse curve sharper than 1500 m radius (True/False)
- 21 Re-alignment of curve is not a identified item to be carried out before laying of LWR / CWR (True/False)
- 22 Minor alignments of curves can be attended in LWR in presence of PWM (True/False)
- 23 In case of LWR packing or renewal of single isolated sleeper not requiring Lifting or slewing of track can be taken up by mate (True/False)
- 24 Ballast section to be checked in LWR before on set of summer by PWM (True/False)
- 25 Mate can impose speed restriction if the temperature exceeds  $t_d + 20^\circ \text{C}$  after maintenance Work is completed manually or by machines (True/False)
- 26 The schedule of gap survey for SEJ & Buffer rails is same (True/False)
- 27 Joints in buffer rails shall be lubricated twice in a year when the rails temp is Beyond  $t_d + 15^\circ \text{C}$  and  $t_d - 15^\circ \text{C}$  (True/False)
- 28 Distressing of LWR shall be due after each maintenance operation disturbing the track resistance (True/False)
- 29 When creep in fixed portion of LWR/CWR exceeds 20 mm, full investigation Shall be carried out and remedial measures to be taken (True/False)
- 30 Distressing of LWR/CWR shall be done by cutting in to LWR's of about 10 Km length (True/False)
- 31 LWR is limited up to 3 km length only (True/False)

- 32 In Zone i & ii the LWR can be permitted on the curve sharper than 360 m radius with special provisions (True/False)
- 33 Pre heating of 10 cm to about 250 °C-350 °C in unavoidable gas cutting of rail to be done (True/False)
- 34 Avoid Round link chain slings for securing the rails (True/False)
- 35 Is the walkie-talkie is equipment of night patrolman as per new gazette? (True/False)
- 36 LWR / CWR can be continued over Arch bridges - (True/False)
- 37 Level crossings situated in LWR/CWR shall not fall within the breathing length- (True/False)
- 38 LWR/CWR can be continued on a 30.5 mt span bridge with rail free fastening provided between abutments - (True/False)
- 39 Buffer rail joints sleepers spacing should be 297.50 mm (True/False)
- 40 SEJ having maximum movement of 120mm and 190mm that should be installed at 10 mtr from the abutment (True/False)
- 41 SEJ should be lubricated once in a month (True/False)

#### Short answers questions :

- 1 What is the reduction of % for ballast resistance for deep screened track in case of PSC sleepers?
- 2 What is wide gap SEJ & Where it is provided?
- 3 What is length of Bena metal two gap modified SEJ ?
- 4 What is the Stock rail length in Bena metal modified SEJ ?
- 5 What is the mean gap of two gap Bena metal SEJ ?
- 6 What is hysteresis curve? What is measures?
- 7 What are the main precautions taken while converting single F/Plated track into CWR/LWR?
- 8 What are the common factors for Buckling in LWR ?
- 9 What are the criteria laid down in LWR manual for distressing?
- 10 What is the general lift prescribed in case of machine tamping in LWR/CWR track?
- 11 What are the steps to be taken for to avoid buckling?
- 12 On Bridge of how much length of a LWR can be permitted for zone-ii when SEJ are being provided at the far ends and approaches with (i) PRC sleepers (ii) With CST-9 approaches.
- 13 What is the formula by which the extension applied by rail tensor to be calculated? If 'L' is the length of segment(  $\alpha$  = is co-efficient of thermal expansion;  $t_0$  = is stress free temp;  $t_p$  = is Pre-vailing Rail temp)?
- 14 What do you know by anchor length and in field how can you decide the anchor length?
- 15 What are the main complications in maintenance of LWR when breathing length exist?
- 16 How the mean rail temperature shall be ascertained for a region?
- 17 What is effect of tractive forces in LWR in addition to thermal forces?
- 18 By which formulae the movement of Tongue rail and stock rail on account of expansion and contraction from one stage to other stage can be calculated with the given data  
A= Area of X-section of rail; E= Modulus of elasticity ;  
L= Co-efficient of thermal expansion;  
T= Temp variation from distressing temp;  
R= Resistance of track per Mtrs/Track).

- 19 What can you know if the gaps are found closed at a temp tower than  $t_d+30$  and /or to fully open to 15mm at a temp at higher than  $t_d-30^\circ\text{C}$  for zone-iii & iv?
- 20 How the reference marks to be fixed in case of modified SEJ (BENA METALS)?
- 21 What are the practical arrangements in the field can be done with SEJ for better maintenance?
- 22 In which conditions the deep screening operation can be done without cutting LWR or temporary distressing?
- 23 When the temp falls beyond the range  $T_d+10^\circ\text{C}$  to  $T_d-20^\circ\text{C}$  during deep screening operation, what arrangement should be made in LWR/CWR?
- 24 What are the range of temp at which hot weather patrolling to be introduced and how many patrolmen to be displayed?
- 25 On Bridge of how much length of a LWR can be permitted for zone-ii when SEJ are being provided at the far ends and approaches with (i) PRC sleepers (ii) With CST-9 approaches.
- 26 Why the rail free fastenings are to be used on bridges with LWR?
- 27 Whether LWR on single span bridge with SEJ on far ends requires any box anchoring on approach of bridge with rocker bearing at one end and roller bearing at other end, why?
- 28 If LWR is not isolated on approaches and allowed on bridge with restricted length why box anchovy on approached required?
- 29 During distressing with rail tensor, How to calculate the elongation required for an Nth segment at a particular rail temp.,  
When  $L$  = Length of segment;  $\alpha$  = Co-efficient of thermal expansion;  
to-  $t_p$  = deference of rail temp from to.
- 30 What should be the speed of the first train immediate after emergency repairs after unusual occurrences like buckling and SEJ failure?
- 31 Which of the following is not a criteria of distressing of LWR?  
The abnormal behavior of LWR/CWR whenever gets manifested in one or more of the following:-
  - i)(a) When gap observed at SEJ exceeds maximum designed gap
  - (b) The gaps between the reference line & tongue rail tip or stock rail corner at various Rail temp shall not differ by more than 10mm from theoretical range.
  - c)When stock/Tongue rail crosses mean position
  - ii) After special maintenances in which the resistance of the track disturbs like deep Screening, lifting, Re-alignment of curve
  - iii)After machine tamping
  - iv)After unusual occurrence of incidents like buckling, weld failure etc
- 32 What special provision can be made to permit LWR on bridge of any length with rail free Fastening and required box anchoring? the girder is supported on rocker at one end and roller at other end.
- 33 What type of new arrangement has been made in new gazette of night patrolman to see the objects without hindrance ?
- 34 By which arrangement the track between two LWR's with different rail section can be Continues?
- 35 What is the minimum rail section, density of sleeper & ballast cushion to make LWR on curves sharper than 360m radius in zone i & ii ?
- 36 In zone i & ii what special arrangement to be made on curve of radius sharper than 360m when LWR/CWR is permitted with required rail section, sleeper density & minimum ballast cushion, if length of curve is more than 250m ?
- 37 Why the breathing length increases with zone

- 38 Stress free temperature in LWR is desired to be higher than  $t_m$  from the consideration of ?
- 39 How through fitting renewal is done in a LWR track ?
- 40 What is the duty of Mate on receiving information of buckling of track at a particular location ?

## AT Welding Manual

### Objective Type

- 1) On compulsory basis if two different graded rails needs welding, portion to be used shall be of  
a) higher grade chemistry      b) Lower grade chemistry
- 2) Pre heating time for air petrol and Oxy-LPG, welding of rails are - minutes respectively  
a) 10 to 12 and 2 to 3      b) 5 to 10 and 4 to 5  
c) 7 to 13 and 3 to 6      d) 8 to 10 and 3 to 5
- 3) Punching marking should be done on strip of \_\_\_\_\_ in case of AT welding of rails  
a) Aluminum    b) Copper    c) Lead    d) Stain less steel
- 4) How many rejected AT Welding portions can ignited at a time ?  
a) 5      b) 8      c) 10      d) 6
- 5) The clear working space required between sleepers during welding of rail joints is \_\_\_\_\_mm  
a) 150      b) 200      c) 250      d) 300
- 6) Controlled quenching for a specific time is required for AT welding of \_\_\_\_\_ rails  
a) 90 UTS    b) 72 UTS    c) HH    d) mm
- 7) How many welding teams can be supervised by a welding supervisor in case of AT Welding of rails  
a) Two teams with in 50Mts distance  
b) Three teams with in 100Mts distance  
c) As many as he can
- 8) In case of AT of rails compressor tank shall be kept at a safe distance of \_\_\_\_\_mts away from burner  
a) 2 to 3      b) 1 to 3      c) 3 to 4      d) > 1M
- 9) Length of rail is to be leveled for welding of rails on cess is \_\_\_\_\_  
a) Full length of rail      b) Half length or minimum 5 Mts  
c) 3 Mts      d) 6 mtrs.
- 10) In case of AT welding, Pre-heating shall be done from the top of the mould box, to achieve temperature is \_\_\_\_\_  
a)  $600 \pm 20^{\circ}\text{C}$     b)  $350 \pm 25^{\circ}\text{C}$     c)  $800 \pm 30^{\circ}\text{C}$     d)  $500 \pm 20^{\circ}\text{C}$
- 11) In AT welding of rails using air petrol burner, the compressor tank pressure during operation shall be maintained at \_\_\_\_\_Kg/Cm<sup>2</sup> / Lb per Sqin  
a)  $7 + 0.70 (100 + 10)$       b)  $9 + 0.90 (130 + 13)$   
c)  $6 + 0.60 (80 + 09)$       d)  $6 + 0.90 (130 + 13)$
- 12) In AT Welding technique used for rail joints, what is the strength of the weld with respective to the rail  
a) 96%    b) 90%    c) 79%      d) 56%
- 13) Rails older than \_\_\_\_\_ years shall not be used for AT welding  
a) 25      b) 40      c) 50      d) 60
- 14) Minimum width of head of 60 Kg Rail permissible for AT welding is \_\_\_\_\_mm  
a) 72      b) 60      c) 56      d) 63

- 15) The distance of HAZ ( Heat Affected Zone) in AT welding of rails \_\_\_\_mm  
a)85                      b)75                      c)60                      d)50
- 16) The bolt hole of the rail should be at \_\_\_\_\_ mm distance from the weld of rails  
a) 60 b) 50                      c) 40                      d) 80
- 17) In AT welding of Rails, reaction takes place in  
a) Aluminum lined Crucible                      b) Sodium lined Crucible  
c)Magnasite lined Crucible                      d) None of the above
- 18) Equipment used in AT welding for preheating of rail ends is \_\_\_\_  
a) Pressure tank                      b) Oxy, LPG Torch  
c) Compressed Air Blower                      d) All the above
- 19) Which component in the welding portion provides elasticity to weld of rail joint  
a) Steel Chips                      b) Silicon Carbide  
c) Ferro Manganese                      d) Ferro Vanadium
- 20) What are the main components in the AT welding portion  
a) Steel Chips                      b) Silicon Carbide  
c) Aluminum Powder                      d) All the above
- 21) The weight of the 52Kg welding portion is \_\_\_\_\_ Kg  
a) 28 b) 30 c)11.8                      d) 10.0
- 22) What temperature is to be should achieved while preheating of rail ends for AT welding  
a)  $550 + 20^{\circ}\text{C}$                       b)  $600 + 20^{\circ}\text{C}$   
c)  $500 + 20^{\circ}\text{C}$                       d)  $400 + 20^{\circ}\text{C}$
- 23) The temperature measuring device in AT welding of rails is \_\_\_\_  
a) Contact type Pyrometer                      b) Optical Pyrometer  
c) Temperature measuring device                      d) All the above
- 24) The reaction time in 25mm gap technique at AT welding of rails is \_\_\_\_\_ sec  
a) 0 – 5                      b) 5 – 6                      c) 17 – 23                      d) 23 – 26
- 26) In case of AT Welding, during aligning Rail ends should kept in peak position due to  
a) To allow early solidification of molten metal  
b)To bear excess load of rolling stock  
c)To compensate sagging of molten metal  
d) None of the above
- 27) In case of AT Welding, delayed tapping will cause loss of  
a) Thermit Steel                      b) Molten Metal  
c) Super heat                      d) Slag inclusion
- 28) In case of AT Welding, early tapping will cause  
a) Sand inclusion                      b) Slag inclusion  
c) Excess Metal                      d) Shortage of meta
- 29) During In-situ welding of rails at least \_\_\_\_\_ nos of sleepers Rail fastenings should be loosened on either side  
a)4                      b)8                      c)6                      d)5
- 30) In case of AT Welding the chipping time for excess metal is \_\_\_\_\_ minutes  
a) 3 – 4                      b) 4 – 6                      c) 6 – 8                      d) 8 – 0

- 31) In case of AT Welding, crack due to shrinkage happens due to  
a) Improper squaring                      b) Poor heating  
c) Auto tapping                              d) Early chipping
- 32) In case of AT Welding latest technique introduced to avoid the defect of fins  
a) Self tapping thimble                      b) One time use crucible  
c) Oxy-LPG system                          d) Three piece drymould
- 33) In case of AT Welding, for which Rail section, it is necessary to cool the joint after welding  
a) UTS Rails    b) HH Rails    c) MM Rails    d) None
- 34) The life of welding portion kept in good storage condition is \_\_\_\_\_ years from date of manufacturing  
a)5                      b)4                      c)3                      d)2
- 35) In case of AT Welding, the cooling arrangement for HH Rail section \_\_\_\_\_ minutes  
a)2                      b)4                      c)5                      d)8
- 36) In case of AT Welding, after completion of the reaction, which component will come on the top of crucible  
a) Fe    b) Al                      c)  $Al_2O_3$                       d) All the above
- 37) In case of AT Welding, rail joints welded by firm shall be guaranteed against failure for \_\_\_\_\_ years  
a) 1                      b)4                      c) 5                      d)2
- 38) In case of AT Welding color of the pre-fabricated mould after sufficient heating is  
a) Pink Color    b) Pale red    c) Orange Yellow    d) Thick red
- 39) In case of AT Welding , brinell hardness test shall be carried out for  
a) The welded zone                      b) HAZ  
c) Parent metal of rail                      d) All the above
- 40) The processes of welding of rail joints in their ascending order of fatigue strength is  
a)FB, AT, Electric Arc, Gas pressure  
b)AT, FB, Electric Arc, Gas pressure  
c) AT, Gas Pressure, Electric Arc, FB  
d)AT, Electric Arc, FB, Gas pressure
- 41) In case of AT Welding during, the number of defective welds shall not exceed \_\_\_\_\_% of the total No of Joints Welded against a particular contract  
a) 2                      b)3                      c) 4                      d) None
- 42) In case of AT Welding, lack of fusion is caused due to  
a) Excess gap                      b)insufficient heating  
c)Before tapping                      d)Improper mould fixing
- 43) In case of AT Welding, slag inclusion is caused due to  
a) Excess gap                      b)insufficient heating  
c)Before tapping                      d)Improper mould fixing
- 44) In case of AT Welding, shortage of metal is caused due to  
a) Excess gap                      b)insufficient heating  
c)Before tapping                      d)Improper mould fixing

- 45) In case of AT Welding, fins are caused due to  
a) Excess gap                      b) insufficient heating  
c) Before tapping                      d) Improper mould fixing
- 49) While executing the AT welding work if sudden rain fall occurs, what precaution has to take to complete the work  
a) Joint should be protected by trolley umbrella  
b) Joint should be protected by the tarpaulin  
c) Joint should be protected by the rain guard  
d) Welding should not be carried out
- 50) If 2 Nos of 25mm weld (AT) are to be done and a portion of 50 mm is only Available which out of the following is the best option for welding of rails joints  
a) Do not weld                      b) Split 50 mm portion in 2 parts and weld
- 51) In case of AT Welding of rails on cess, full rail length should be supported on at least \_\_\_\_\_ nos wooden blocks on either side of proposed weld case of welding of rails on cess  
a) 10                      b) 20                      c) 6                      d) 8
- 52) In case of AT Welding of rails, for proper and uniform preheating of both rail ends, height of Goosen neck from rail top should be \_\_\_\_\_ mm  
a) 40                      b) 30                      c) 20                      d) 50
- 53) In case of AT Welding of rails, minimum traffic block required in the process of preheating with air Petrol mixture for SPW is \_\_\_\_\_ minutes  
a) 60                      b) 45                      c) 75                      d) 90
- 54) In case of AT Welding, minimum traffic block required in the process of preheating with air Petrol mixture for wide gap is \_\_\_\_\_ minutes  
a) 70                      b) 60                      c) 90                      d) 45
- 55) In case of AT Welding, reaction time of ignition of Portion is \_\_\_\_\_ seconds  
a)  $20 \pm 3$                       b)  $25 \pm 3$                       c)  $30 \pm 3$                       d)  $45 \pm 3$
- 56) In case of AT Welding, molten metal should be taped with in \_\_\_\_\_ seconds  
a)  $20 \pm 3$                       b)  $25 \pm 3$                       c)  $30 \pm 3$                       d)  $45 \pm 3$
- 57) In case of AT Welding of rails of 90 UTS Rails, controlling of cooling should be ensured by post heating of rail & flange up to \_\_\_\_\_ cms on either side of mould Box with the help of Vaporizer  
a) 50                      b) 45                      c) 60                      d) 30
- 58) In case of AT Welding of rails, chipping of hot metal should be done with in \_\_\_\_\_ minutes of Pouring of molten metal in to the gap  
a) 4 to 5                      b) 5 to 6                      c) 3 to 4                      d) 6 to 7
- 59) In case of AT Welding, if a Portion need to be used beyond 02 Years after the Date of Manufacturing , one random sample for batch \_\_\_\_\_ or part there of shall be tested for reaction test and if reaction in normal , batch represented by the sample can be used with out further tests  
a) 300                      b) 200                      c) 250                      d) 150
- 60) Normally, no alumino – thermit welded joint shall be located closer than \_\_\_\_\_ mts from any other welded or Fish Plated Joint  
a) 4                      b) 6                      c) 45                      d) 65
- 61) Weld collar painting to be done once in \_\_\_\_\_ years in area not Prone to corrosion  
a) 4                      b) 3                      c) 2                      d) 5

- 62) Weld collar painting to be done once in \_\_\_\_\_ years in corrosion prone area  
a) 4                      b) 3                      c) 2                      d) 1
- 63) For sample testing one out of every 100 Joints welded shall be selected at random and should be got tested within \_\_\_\_\_ month of welding for its hardness, traverse loads and Porosity  
a) 1                      b) 2                      c) 3                      d) 4
- 64) The 1st train should be Passed only after \_\_\_\_\_ minutes of Pouring of molten metal and after rough finishing of welded Joint  
a) 30                      b) 15                      c) 45                      d) 20
- 65) The rail end face and adjacent sides at foot, web and head up to \_\_\_\_\_ mm shall be thoroughly cleaned using kerosene oil and brushing with wire brush to remove all dirt, grease & rust before welding  
a) 50                      b) 60                      c) 45                      d) 75
- 66) For vertical alignment of Joint before welding after alignment, the Joint shall be kept higher by \_\_\_\_\_ mm for 90 UTS rails when measured at the end of 10m straight edge  
a) 2 to 4                      b) 3 to 4                      c) 4 to 6                      d) 1 to 2
- 67) In case AT welding, the compressor tank shall be kept at least \_\_\_\_\_ meters away from burner to prevent fire hazard  
a) 2 to 3                      b) 3 to 4                      c) 1 to 2                      d) 4 to 6
- 68) In case of AT welding, the life period of premixed lutting sand is \_\_\_\_\_ months  
a) 4                      b) 6                      c) 2                      d) 12
- 70) In case of AT Welding, minimum time period up to which the wedges should not be removed after trimming is \_\_\_\_\_ minutes  
a) 20                      b) 30                      c) 15                      d) 10
- 71) What is the limiting value of defective weld executed by the welder to obtain permanent regular competency certificate as per the TW2 programme?  
a) 1%                      b) 2%                      c) 3%                      d) 5%

### **Fill in the Blanks**

- 1) In case of AT Welding, Centre line of rail gap should co-inside with \_\_\_\_\_
- 2) Welding portion used for welding of rail joints is a composition of \_\_\_\_\_
- 3) In case of AT Welding after heating Alumina and iron oxide changes to \_\_\_\_\_

### **Short Answers Questions :**

- 1) Welding of rails joints should be done by trained welder having valid competency certificate from \_\_\_\_\_?
- 2) In case of AT welding, final finishing tolerance for vertical alignment is \_\_\_\_\_ mm
- 3) In case of AT welding, final finishing tolerance for lateral alignment is \_\_\_\_\_ mm
- 4) In case of AT welding, final finishing tolerance for top table surface is \_\_\_\_\_ mm
- 5) In case of AT welding, final finishing tolerance for sides of head is \_\_\_\_\_ mm

- 6) What is the maximum lateral/vertical wear permitted for secondary AT welding ?
- 7) How much length of rail ends should be cropped if released from LWR/CWR for secondary renewals ?
- 8) At the time of AT welding, the permissible limit in vertical alignment is ———mm.
- 9) In case of AT welding, how many joints are to be test checked ?
- 10) In case of AT welding, what are the limitations of end bends of rails to be welded ?
- 11) In case of AT welding, what are the general defects of mould ?
- 12) In case of AT welding, why longitudinal crack in rail will occur at weld joint ?
- 13) In case of AT welding, why cold spots – lack of fusion occurred ?
- 14) In case of AT welding, why lack of fusion on foot of one rail end ?
- 15) In case of AT welding, why porosity occurs in thermit steel ?
- 16) In case of AT welding, why gross inclusion of slag occurs in rail head ?
- 17) In case of AT welding, why cracking of weld occurs after cooling rail ends ?
- 18) In case of AT welding, why gross slag inclusion in rail head on one side occurs
- 19) In case of AT welding, why cold spot – lack of fusion and associated local porosity occurred ?
- 20) In case of AT welding, why gross porosity through out the whole weld section occurs ?
- 21) In case of AT welding, how much area to be painted at weld collar ?
- 22) In case of AT welding, the number of defective welds permitted in a particular contract ?
- 23) In case of AT welding, bolt hole should have minimum clearance from cut faces is ?
- 24) Who has developed the method of AT welding technique?
- 25) Is it suggestible to use 90 UTS portion to weld MM rails
- 26) In case of AT welding, crucible is repaired with magnacite or silica?
- 27) In case of AT welding, what is the max height of the crucible from the top of prefabricated mould ?
- 28) In case of AT welding, which type of box is to be used for storing portion in the field?
- 29) What is the essential equipment required to take up welding of rail joints in falling temperature?
- 30) In case of AT Welding, which material is used to avoid direct contact between closing pin and thermit mixture in the crucible?)
- 31) In case of AT Welding, which material is used to achieve workability in preparations of moulds?
- 32) In case of AT Welding, ignition sticks are made of?
- 33) In case of AT Welding, of the two AT welding process, which process adopts lesser initial gap between rail ends?
- 34) In case of AT welding, what is the difference between Blow holes and Pin hole?
- 35) In case of AT welding, what is called vigorous reaction or Boiling?
- 36) What is use of the asbestos powder used in AT welding
- 37) In case of AT welding, write two reasons which will affect loss of super heat?

- 38) What is fusion in case of AT welding
- 39) What is the cause of porosity in case of AT welding
- 40) Why HH Rail section is required to cool after the welding?

## USFD Manual

### Objective Type:

- 1) USFD is a type of  
(a) Non destructive testing (b) Destructive testing  
(c) Magnetic particle testing (d) Dye penetration testing
- 2) Frequency of Ultrasonic wave is \_\_\_\_ KHz  
(a) Below 20 (b) Above 10 (c) Above 20 (d) Below 10
- 3) Frequency of USFD testing of rails on B/G section below or equal to 5GMT  
(a) Once in 5 years (b) Once in six months  
(c) Once in year (d) Once in two years
- 4) In USFD Velocity of longitudinal wave in steel  
(a)  $273 \times 10^3$  (b)  $59 \times 10^3$  (c)  $378 \times 10^3$  (d)  $18 \times 10^3$
- 5) In USFD, longitudinal wave is more than shear wave by \_\_\_\_ times  
(a) 1.82 (b) 1.6 (c) 2 (d) 2.82
- 6) In USFD, Velocity of shear wave in steel is \_\_\_\_ m/s  
(a)  $2.73 \times 10^3$  (b)  $5.9 \times 10^3$  (c)  $3.23 \times 10^3$  (d)  $1.8 \times 10^3$
- 7) In USFD, Linearity of time base means  
(a) Verification of vertical scale (b) Verification of horizontal scale  
(c) Calibration of linear scale (d) None of these
- 8) In USFD, Transverse fatigue cracks in head are detected by \_\_\_\_ probe (a)  $0^\circ$   
normal (b)  $80^\circ$  (c)  $70^\circ$  (d)  $37^\circ$
- 9) In USFD, Defect codification of Transverse crack in Thermit weld joint is  
(a) 111 (b) 212 (c) 421 (d) 422
- 10) Total life of USFD machine is \_\_\_\_ Years  
(a) 8 (b) 5 (c) 2 (d) 10
- 11) For USFD, Single rail tester is provided with \_\_\_\_ No of probes  
(a) 3 (b) 5 (c) 2 (d) 1
- 12) In USFD, Concept of need based inspection is  
(a) Inspection frequency dependent on type of machine  
(b) Inspection frequency dependent on the incidence of defects (c) Inspection frequency dependent on type of rail  
(d) All the above
- 13) In USFD, If classification of rail defect is IMR, then paint mark on both faces of web is  
(a) XX with red paint (b) X with red paint  
(c) XXX with red paint (d) XXX with yellow paint
- 14) In USFD, Dead zone is more in  
(a) Single crystal probe (b) Double crystal probe  
(c) Single & double crystal (d) None of these
- 15) The sensitivity of USFD equipment shall be set up, with help of standard test rail piece at once in a  
(a) Week (b) Day (c) Month (d) 2 days

- 16) In USFD, the gap between the contact face of normal probe and the sole of probe shoe shall be \_\_\_\_\_mm  
(a) 0.1 (b) 0.5 (c) 1 (d) 0.2
- 17) In USFD, \_\_\_\_\_probe is used to detect porosity, blow hole and slag inclusion in head and up to mid web of AT weld  
(a) 0° 4 MHz (b) 70° 2 MHz (c) 0° 2 MHz (d) 37° 2 MHz
- 18) In USFD, Horizontal distance of the flaw from the probe index mark shall be calculated using formula  
(a)  $H = D \sin \theta$  (b)  $H = S \sin \theta$  (c)  $H = S \cos \theta$  (d)  $H = D \tan \theta$
- 19) In USFD, Periodicity of setting the sensitivity calibration against temperature variation shall be carried out at least once in \_\_\_\_\_ (a) month (b) year (c) week (d) 3 months
- 20) In USFD, Minimum flaw size which can be detected by present ultrasonic probes used in the rail tester is \_\_\_\_\_mm  
(a) 1 (b) 0.5 (c) 0.8 (d) 3
- 21) In USFD, Latest technical specification No for digital ultra sonic testing equipment for welded rail joint with LCD screen, trigonometrically function and A- scan storage is  
(a) M&C/NDT/129/2005 (b) M&C/NDT/200/2005  
(c) M&C/NDT/128/2007 (d) None of these
- 22) In USFD, Length of co-axial cable for probes shall not be more than \_\_\_\_\_ m  
(a) 2.0 (b) 5 (c) 2.5 (d) 3
- 23) In USFD, Frequency of Gauge face corner testing of rails is \_\_\_\_\_ (a) Once in year  
(b) Same as flange testing (c) At the same frequency specified under NBC (d) None of these
- 24) In USFD, Defects lying below, scabs / wheel burns can be detected by \_\_\_\_\_ probe on head  
(a) 0° 4 MHz normal (b) 70° angle (c) 0° 2 MHz (d) 45° 2MHz side
- 25) In USFD, Defects are nearly vertical; they can be detected by using \_\_\_\_\_  
(a) additional gain of 10 db (b) horizontal crystal  
(c) vertical crystal (d) None of the above
- 26) In USFD, Frequency of first periodic testing of SKV welds on B/G section route GMT is more than 45  
(a) Once in 2 years (b) One year  
(c) Once in a month (d) Once in 3 years
- 27) In USFD, If classification of rail weld defect is DFW (un protected), then the speed restriction imposed by USFD PWI is \_\_\_\_\_ Kmph  
(a) 20 (b) 30 (c) 50 (d) 70
- 28) In USFD, accomplish GFC testing in present available SRT machines, shifted 70° (F&B) GFC probes are used in place of \_\_\_\_\_ probe (a) 0° (b) 70° (F&b) (c) 37° (F &B)  
(d) None of the above
- 29) In USFD, No of probes in DRT modified to suit GFC testing are  
(a) 10 (b) 5 (c) 6 (d) 4

- 30) In USFD, First periodic test of Gauge face corner testing of rails in new rails to be done at  
 (a) Once in year (b) After passage of 40GMT  
 (c) At the same frequency specified under NBC  
 (d) None of the above
- 31) In USFD, Linearity of amplitude means  
 (a) Verification of vertical scale (b) Verification of horizontal scale  
 (c) Calibration of linear scale (d) None of these
- 32) In USFD, If classification of rail weld defect is DFW protected), then the speed restriction for passenger trains shall be imposed is \_\_\_\_ Kmph  
 (a) 20 (b) 30 (c) 70 (d) 100
- 33) As per Para (iv) of USFD manual/correction slip No, check proper function of 70° angle probes with respect to  
 (a) rail ends at fish plated joint (b) Gauge face corner  
 (c) Head web junction (d) None of these
- 34) In USFD, Oscillogram pattern for 45° probe mounted in test rig detected transverse crack on major bridge and to mark IMR classification is  
 (a) Loss of signal height equal to or more than 80% of full scale height  
 (b) Loss of signal height equal to or more than 20% of full scale height  
 (c) Flaw echo height equal to or more than 20% of full scale height (d) Flaw echo height equal to or more than 20% of full scale height
- 35) Periodicity of setting the Horizontal calibration of USFD equipment (a) Once in a month  
 (b) Daily  
 (c) Once in a week (d) Once in 3 months
- 36) In USFD, OBS in a Gauge corner defect is classified as (a) OBS  
 (x) (b) OBS(C)  
 (c) GCC (d) OBS (G)
- 37) In USFD, Defect codification of Transverse crack in Flash but weld joint is  
 (a) 411 (b) 212 (c) 421 (d) 412
- 38) In USFD, Horizontal cracks in web are detected by \_\_\_\_\_ probe (a) 0° normal probe  
 (b) 80° angle probe  
 (c) None of these (d) 70° angle probe
- 39) In USFD, Half moon cracks in AT welds are detected by \_\_\_\_\_ probe on hand  
 (a) 0° 2 MHz (b) 45° (c) 80° (d) 70°
- 40) What is the periodicity of inspection of sectional AEN with USFD team?  
 a) Minimum two hours each month b) Min one hr each month c) Once in a month  
 d) Quarterly
- 41) In USFD, the minimum probe gap between probing face and probing shoe is \_\_\_\_ mm  
 a) 0.2 b) 0.6 c) 0.3 d) 1
- 42) In USFD, for sensitivity checking the duration is  
 a) once in week b) Once in a month  
 c) Every day d) Once in 15 days

- 43) In USFD, The Ultra sonic probes used in the rail tester have frequency of 4 MHZ and 2 MHZ, hence cracks less than .....mm size cannot be detected  
a) 0.8 b) 1 c) 05 d) 06
- 44) In USFD, for detection of bolt hole cracks which probes are ideal? a)  
37° b) 70° c) Normal d) 80°
- 45) In USFD, checking of the resolving power is made?  
a) Once in a month b) once in a week c) once in  
fort night d) every day
- 46) In USFD, segregation in head and web junction is detected by \_\_\_ probe  
a) 0° b) 70° c) 37° d) 80°
- 47) In USFD, wheel bushes(2251, 2252) is detected by \_\_\_\_\_ Probe  
a) 70° b) 0° c) 37° d) 80°

#### Fill in the Blanks questions:

- 1 In USFD, NBC means \_\_\_\_\_
- 2 In USFD, Any horizontal defect progressing at an angle in vertical plane in the rail when tested with normal probe 4 MHZ, when there is no back echo and no flaw echo should be marked as \_\_\_\_\_
- 3 In USFD, Normal probe 4HZ used to detect defect of within fish plated area with oscillogram Pattern no back echo, flaw echo is classified as \_\_\_\_\_
- 4 In USFD, 70° probe 2MZ, of any traverse defect in rail head with flaw echo of 50% horizontal scale movement and 60% of full scale height or more is classified as \_\_\_\_\_
- 5 \_\_\_\_\_ shall be used for acoustic coupling in stead of water for AT welding testing with USFD
- 6 In USFD, Oscillogram Pattern of no back echo and no flaw echo detected by normal probe outside the fish plated area on major bridges & bridge approaches should be marked as \_\_\_\_\_
- 7 In USFD, No back echo with or without shifting flaw echo detected by normal probe outside fish plated area in vicinity of holes near the weld should be marked as \_\_\_\_\_
- 8 In USFD, horizontal crack below neutral axis in AT weld area can be tested or not with 0° probe ?(Yes or NO)
- 9 As per CS No 3, In USFD, oscillogram Pattern of loss of signal height equal to more than 20% but less than 80% of full scale height detected by 45° should be classified as \_\_\_\_\_
- 10 In USFD, Defect modification of transverse crack in Flash weld is \_\_\_\_\_

#### Short answer questions:

- 1 In USFD, When 45° probe is used ?
- 2 In USFD, What defects are detected by 70° angle probe?
- 3 In USFD, What is the function of sensitivity of normal probe?
- 4 In USFD, What is the function of sensitivity of 70° angle probe (Forward and back ward) ?
- 5 In USFD, What is the function of sensitivity of angle probe 37° (Forward & backward) ?

- 6 Why calibration is required before conducting USFD test?
- 7 In USFD, What action to be taken in respect of defect classified IMR, IMRW ?
- 8 In USFD, What action to be taken for defect classified as OBS, OBSW?
- 9 What action to be taken after detection of defects in At welds classified "DFW"
- 10 In USFD, What is the limitation of probes detection at present ?
- 11 In USFD, What for 0° probe (double crystal) is used ?
- 12 In USFD, As per correction slip No 3 to manual for Ultra sonic testing of rails & welds what is recorded as GCC
- 13 In USFD, What action to be taken for defective weld 'DFW' with 0° 2MHZ, 70° 2MHZ, 45° 2MHZ marked with 2 cross with red paint?
- 14 In USFD, For conventional AT welds, what is the frequency of testing?
- 15 In USFD, What is the frequency for testing SKV welds
- 16 What is the progress of USFD manual machine?
- 17 In USFD, What is range calibration for detection of SEJ with 45° probe?
- 18 In Ultra sonic testing of rails & welds what is the sensitivity setting of 0° probe?
- 19 What is resolving power in USFD?
- 20 IN USFD, What is size of crystal for 70° probe 2MHZ for testing flange and head test of AT welds?
- 21 What is the required penetration power for good USFD machine?
- 22 In LWR/CWR preferably which USFD machine should be deployed?

## Track Machine Manual

### Objective Type:

- 1) Minimum clean ballast cushion required for tamping is \_\_\_\_\_mm  
a) 150    b) 200    c) 300    d) 250
- 2) Gap between TOP edge of tamping tool blade and bottom edge of flat bottom sleeper is \_\_\_\_\_mm  
a) 10-12    b) 16-18    c) 08-10    d) 06-08
- 3) What is the maintenance packing squeezing time for tamper is \_\_\_\_\_sec  
a) 04-06    b) 02-04    c) 06-08    d) 08-10
- 4) How much wear of t/tools are allowed  
a) 20%    b) 10%    c) 30%    d) 40%
- 5) The CSM tamping squeezing pressure to be adjusted for flat bottom PSC sleeper is \_\_\_\_\_  
—Kg/cm<sup>2</sup>  
a) 110-120    b) 120-140    c) 140-160    d) 100-110
- 6) The UNI tamping squeezing pressure to be adjusted for flat bottom PSC sleeper is \_\_\_\_\_  
—kg/cm<sup>2</sup>  
a) 135-140    b) 120-135    c) 100-120    d) 140-160
- 7) The minimum general lift is req for tamping is \_\_\_\_\_mm  
a) 10    b) 20    c) 30    d) 40
- 8) Max lift to be given on LWR/CWR track while tamping at a time is \_\_\_\_\_mm  
a) 50    b) 40    c) 60    d) 100
- 9) The lifting cap of PQRS machine is \_\_\_\_\_tonne  
a) 9    b) 10    c) 12    d) 6
- 10) The maximum speed of PQRS Portal crane is \_\_\_\_\_KMPH  
a) 14    b) 20    c) 15    d) 8
- 11) How many insertion are required for lifting of 50mm for concert sleeper tamping  
a) 2    b) 4    c) 3    d) 1
- 12) The permissible speed on self profiled for BCM is \_\_\_\_\_KMPH    a) 30  
b) 20    c) 40    d) 50
- 13) The permissible speed on self profiled for CSM is \_\_\_\_\_KMPH    a) 50  
b) 60    c) 30    d) 20
- 14) The permissible speed on self profiled for FRM is \_\_\_\_\_KMPH,    a) 30  
b) 40    c) 20    d) 50
- 15) The permissible speed on self profiled for DGS is \_\_\_\_\_KMPH  
a) 60    b) 50    c) 40    d) 30
- 16) The permissible speed on self profiled for UNI is \_\_\_\_\_KMPH    a) 6    b) 50  
c) 40    d) 30
- 17) Stabilization equivalent for DGS machine carries one pass  
a) 1 lakh    b) 2 lakh    c) 50,000    d) 40,000

- 18) The speed of cutting chain of BCM is \_\_\_\_\_m/s  
a) 24 -40 b) 5 c) 2 d) 15
- 19) Width of obstruction free required for BCM cutting chain movement is \_\_\_\_\_mm  
a) 4100 b) 3100 c) 2500 d) 4000
- 20) How many machines can be allowed run through movement from one station to another station on line clear ?  
a) 3 b) 4 c) 2 d) 5
- 21) How many machines can be allowed in ghat section steeper than 1/100 gradient ?  
a) 1 b) 2 c) 3 d) 4
- 22) What is medical category is required for staff working in track machines ?  
a) A-3 b) A-1 c) B d) B-2
- 23) What min safe distance to be maintain while moving machines in a convey ?  
a) 120 b) 100 c) 50 d) 60
- 24) In 09-32 CSM machine \_\_\_\_\_ nos of tamping tools are provided a) 32  
b) 30 c) 24 d) 36
- 25) For tamping of one sleeper \_\_\_\_\_nos tamping tools are provided a) 16  
b) 20 c) 32 d) 36
- 28) \_\_\_\_\_speed to be resumed after deep screening with BCM and one round of tamping along with DGS?  
a) 40 b)50 c)30 d) 65
- 29) The level of auxiliary track should not be more than \_\_\_\_\_mm higher than the existing track  
a) 50 b) 75 c) 25 d) 100
- 30) What is the frequency of training that the operator should undergo in train working rules?  
a) once in 3 yrs b) once in 5 yrs c) once in 2 yrs d) Annually
- 31) What is the size of tamping blade?  
a) 140 x 70mm b) 140 x 60mm c) 120 x 70mm d) 150 x 70mm
- 32) The lifting capacity of T-28 machine \_\_\_\_\_tonnes  
a) 30 b)20 c) 40 d) 25
- 33) What is the weight age factor of Ballast cleaning machine, Shoulder ballast cleaning machine?  
a) 15 b) 20 c) 12 d) 25
- 34) What is the stipulated out put of CSM machine for one effective block hour ?  
a)1.2 Km b) 1.0Km c) 0.8 Km d) 1.3 Km
- 35) What is the stipulated out of DUO machine for one effective block hour ?  
a)1.2 Km b) 1.0Km c) 0.8 Km d) 1.3 Km
- 36) What is the stipulated out put of the T-28 machine ?  
a)1T/Out in three gross block hours  
b)1T/Out in 3 ½ has block hours
- 37) What is the stipulated out put of UNIMAT machine in gross block hour?.

- 38) a) 0.3 Km or 1 T/out    b) 0.5 Km or 1 T/out    c) 0.4 Km or 1 T/out  
What is the stipulated out put of BCM machine per effective block hour ?.  
a) 0.2 Km    b) 0.3 Km    c) 0.4 Km    d) 0.25 Km
- 39) What is the stipulated out put of he FRM machine per effective block hour ?.  
a) 0.30 Km    b) 0.4 KM    c) 0.2 Km    d) 0.5 Km
- 40) In BCM machine how many engines are available ?.  
a) Two    b) Three    c) one    d) five
- 41) With RM-76 BCM — mm width excavation can be done  
a) 772    b) 760    c) 672    d) 700
- 43) Who is responsible for pre block, block operation (other than machine operation) and post block operations of machines?  
a) PWI    b) Machine in –charge    c) BTC    d) All the above
- 44) After — Km of work POH of CSM be done  
a) 3750    b) 4000    c) 3000    d) 3500
- 45) The rated out put of CSM one effective block hour —sleepers  
a) 2000    b) 1500    c) 2500    d) 1800
- 46) After —nos of T/o's work, POH of UNIMAT is to be done  
a) 5000    b) 4000    c) 3000    d) 4500

#### Short answer questions:

- 1 What is general lift given during machine packing?
- 2 What is the rated output/effective block hours of Duomatic machine is —sleeper?
- 3 What is the frequency of technical staff working on track machines shall undergo training?
- 4 What precautions are to be taken while working with track machine?
- 5 In CSM working for carrying out attentions to longitudinal alignment, which rail is taken as datum?
- 6 What are important items to be checked in machines by inspecting officials
- 7 For CSM working, what is tamping cycle currently in existence
- 8 What special precautions are to be taken while machine is working in ghat section ?.
- 9 What are the screen sizes available in screening unit of BCM ?.
- 10 List of some pre tamping operations ?.
- 11 As per LWR manual at what temperature machine should work for maintenance of track
- 12 What is the lifting capacity of one portal of PQRS ?.
- 13 What is geometry valve assessment ( GVA) in CSM working?
- 14 For developing hydraulic pressure in various system in track machine which oil is used ?.
- 15 Why 4 point lining is not preferable for straight track ?.
- 16 What type of lining methods are in use on tramping machines ?.
- 17 What ramp in & Ramp out is required for smooth run of trains for beginning at closing of works for tamping machine ?.
- 18 What type leveling systems are in use on tampers
- 19 What is function of front pendulum in CSM ?
- 20 What is function of middle pendulum in CSM?
- 21 What is function of transducer rear pendulum in CSM?
- 22 What is function of transducer galvenometer in CSM?
- 23 What is the reason if lining system working slowly in CSM?
- 24 While tamping bank up position tamping unit could not blocked what may be the reason

- 25 What is the difference in tamping machines and DGS machines in leveling correction system?
- 26 What is the capacity of BCM for lifting & slewing?
- 27 What is tamping cycle for PSC sleepers track?
- 28 How to select the datum rail for lining in CSM working?
- 29 As per IRTMC/2000 manual, the work & return of track machines in wrong direction allowed or not ?.

## Works Manual

### Objective Type

- 1) The schedule for painting of wood & steel work of interior area of building ?  
a) 5 to 7 yrs    b) 3-5 yrs    c) Annual    d) 2 Yrs
- 2) The minimum plinth area of Type-II unit, without stair case is \_\_\_\_ sqm.  
a) 45    b) 50    c) 40    d) 55
- 3) What is the schedule for colour washing for exterior plastering surface of hospital, where rain fall is more than 1500 mm per annum?    a) every year    b) every two years  
c) every three years    d) every six months
- 4) What is the schedule of colour washing for exterior plastering surface of Type-II staff quarters where rain fall more than 1500 mm per annum?  
a) 2 yrs    b) Annual    c) 3 yrs    d) 6 months
- 5) The spacing between rain water out let pipe should not be more than \_\_\_\_\_ meters?  
a) 6    b) 4    c) 3    d) 5
- 6) The approximate % area of windows in floor area should be?    a) 15 to 20%    b) 20 to 30%  
c) 30 to 40%    d) 10 to 15%
- 7) The height of Dado in Kitchen of staff Canteen is \_\_\_\_\_ mm  
a) 1200    b) 750    c) 1000    d) 900
- 8) The Suburban stations are included in category station  
a) C    b) D    c) B    d) A
- 9) The standard height of booking window is \_\_\_\_m above floor level a) 0.6    b) 0.75  
c) 0.45    d) 0.5
- 10) In vicinity of Railway line blasting operations within \_\_\_\_\_ Mtrs of a running line should normally be carried under block protection  
a) 100    b) 60    c) 50    d) 30
- 11) At non suburban Stations other than junctions and terminal stations waiting room should be provided only if the upper passengers dealt with daily are \_\_\_\_\_  
a) 25 or more    b) 50 or more    c) 100 or more    d) 20 or more
- 12) The schedule for interior white washing for hospitals is \_\_\_\_?  
a) once in year    b) 2 yrs    c) 3 yrs    d) 6 months
- 13) The schedule for interior white washing for kitchen of hospital & running room?  
a) once in year    b) 2 yrs    c) 3 yrs    d) 6 months
- 14) The minimum height of habitable rooms in a building is \_\_\_\_ m? a) 3    b) 3.1  
c) 3.3    d) 2.7

- 15) The minimum width of kitchen is \_\_\_\_\_ m  
a) 1.8    b) 2.1    c) 2.4    d) 1.5
- 16) The minimum thread of stair \_\_\_\_\_ Meters  
a) 0.25    b) 0.2    c) 0.3    d) 0.15
- 17) The maximum riser of stair \_\_\_\_\_ mm  
a) 190    b) 150    c) 200    d) 160
- 18) The maximum no of risers in a flight are \_\_\_\_\_ Nos  
a) 15    b) 12    c) 10    d) 18
- 19) The minimum width of toilet is \_\_\_\_\_ m  
a) 0.9    b) 1    c) 1.2    d) 0.75
- 20) The minimum height of plinth above road level is \_\_\_\_\_ Cms  
a) 45    b) 60    c) 75    d) 90
- 21) The minimum parapet wall height in building is \_\_\_\_\_ Meters  
a) 1.2    b) 0.6    c) 0.75    d) 1
- 22) What is category of station of tourist importance?  
a) B-II    b) A    c) A-I    d) D
- 23) The specified platform shelter area of 400 sqm on each PF on 'A' category station considered as per  
a) Desirable amenities  
b) Minimum essential amenities c) Recommended amenities
- 24) As per minimum essential amenities the no of taps to be provided on each plat form of 'A' category station?  
a) 12    b) 10    c) 6    d) 15
- 25) In model stations, which type of amenities to be provided?  
a) Minimum essential amenities    b) Desirable amenities    c) Recommended amenities
- 26) In a broad gauge section, the height of a high level plat form is \_\_\_\_\_ mm above rail level  
a) 760 to 840    b) 800-840    c) 700-760    d) 460-760
- 27) At the end of platform ramp with a slope not steeper than?  
a) 1 in 12    b) 1 in 8    c) 1 in 6    d) 1 in 4
- 28) The height of plat form fencing at single facing plat form \_\_\_\_\_ meters  
a) 1.8  
b) 2    c) 1.6    d) 2.1
- 29) What is the criteria to provide drinking water taps on platforms?  
a) one tap for two coaches    b) 2 taps for two coaches  
c) 4 taps for two coaches    d) one tap for 4 coaches

- 30) How many no. of latrines and urinals to be provided for ladies on passenger platform?  
a) 1/3rd of total requirement    b) 1/2 of total requirement    c) 1/4 of total requirement    d) 3/4 of total requirement
- 31) The size of platform number board is \_\_\_\_ mm  
a) 600 x 600    b) 450 x 480  
c) 450 x 450    d) 500x 500
- 32) The colour combination of platform name board is?  
a) Black figures on yellow back ground  
b) Black figures on white back ground  
c) White figures on blue back ground
- 33) The lowest over head clearance for movement in FOB's and subways is \_\_\_\_ meters  
a) 2.7    b) 3    c) 3.1    d) 2.4
- 34) The min Waiting hall area required to be provided on 'A' category station \_\_\_\_ Sqm  
a) 100    b) 150    c) 200    d) 75
- 35) What is the slope of platform surface?  
a) 1 in 40    b) 1 in 50    c) 1 in 60    d) 1 in 80
- 36) At what distance from coping of platform the demarcation line will be drawn?  
a) 1.80 mts    b) 1.2 mts    c) 2 mts    d) 1.5 mts
- 37) In a gravity pipe line what is the limit for working pressure?  
a) 2/3rd of test pressure    b) 1/3rd of test pressure  
c) 1/4 th of test pressure    d) 1/2 of test pressure
- 38) In a pumping line what is the limit for working pressure?  
a) 1/2 of test pressure    b) 1/3rd of test pressure  
c) 1/4 th of test pressure    d) 2/3rd of test pressure
- 39) Which distribution system is adequate for small way side stations?    a) Three distribution system    b) Grid distribution system
- 40) In which system the water will be supplied in two directions?  
a) Three distribution system    b) Grid distribution system
- 41) The minimum clear vertical height between water line layout and sewer line layout at crossings is \_\_\_\_ meters  
a) 0.5    b) 0.6    c) 0.3    d) 0.75
- 42) At what intervals the water samples will be sent for chemical examination?  
a) once in year    b) once in 2 yrs  
c) once in 3 months    d) once in 6 months
- 43) What percentage of the supplied water will be considered to reach sewers?  
a) 80%    b) 60%    c) 50%    d) 75%

- 44) What is the minimum rate of flow at delivery end of hydrant for carriage watering System in Liters per minute?  
a) 100    b) 50    c) 75    d) 120
- 45) To design distribution system peak factor to be consider as?  
a) 2.5    b) 2    c) 3    d) 1.5
- 46) In a socket and spigot pipe line socket facing direction is?  
a) Opposite to flow of water    b) Indirection of flow of water
- 47) The quantity of water required per head in a work shop is \_ Ltrs/day.    a) 20  
b) 25    c) 30    d) 45
- 48) The minimum residual chlorine required to be available at the farthest point is \_\_\_\_ PPM  
a) 0.2    b) 0.1    c) 0.3    d) 0.01
- 49) To conduct orthotolodine test what is the quantity of water sample required to add 1ml. of orthotolodine?  
a) 100 ml    b) 50 ml    c) 150 ml    d) 40ml
- 50) When protection against viral infection is required, the minimum residual chlorine required is \_\_\_\_ PPM  
a) 0.5    b) 0.2    c) 0.1    d) 1
- 51) What are the advantages of rain water harvesting?  
i) Decrease salinity ii) Affects rise in ground water table iii) Prevents ingress of sea water in subsurface aquifers in coastal areas  
a) i and ii    b) ii and iii    c) i and iii    d) all
- 52) Methods of Re-charging surface aquifers  
i) Through recharge pit ii) recharge through shaft iii) Recharge trench with bore iv) recharge through abandoned well  
a) i and ii    b) iii and iv    c) i to iii    d) all above
- 53) The self cleaning velocity in sewer line is \_\_\_\_ m/sec  
a) 0.8    b) 0.6    c) 0.4    d) 1
- 54) The maximum velocity of flow is limited in a sewer line is \_\_\_\_ m/sec  
a) 2    b) 3    c) 2.5    d) 4
- 55) What rate the water closets required to be provide for female staff ? One for every \_\_\_\_ persons  
a) 10    b) 15    c) 20    d) 25
- 56) What slope will be provided in bath rooms towards outlets?  
a) 1 in 60    b) 1 in 40    c) 1 in 30    d) 1 in 80
- 57) The maximum size of sewer line in hilly areas where steep slopes are available?  
a) 100mm dia    b) 80mm dia    c) 60mm dia    d) 50mm dia
- 58) The normal detention period in a septic tank made for below 50 users is \_\_\_\_ hours  
a) 24 to 48    b) 12-24    c) 24-36    d) 36-48

- 60) When the septic tank is treated working satisfactorily?  
 i) if the effluent is odour less ii) if the effluent is not attracting flies and mosquitoes iii) if the PH value of effluent is not less than 7  
 a) I and ii      b) ii and iii      c) i and iii      d) all

61) What is the time limitation for licensing the borrow pits and tanks to pisciculters?  
 a) 1-5 yrs      b) 10 yrs      c) 19 yrs      d) 20yrs

62) By what percentage the licensing fee will be increased every year?      a) 10%  
 b) 20%      c) 6%      d) 12%

63) On which date the licensing fee will be enhanced every year?  
 a) 1st April      b) 1st August      c) 1st January

64) The maximum distance between posts, when the Rly boundary in the form of detached marks \_\_\_\_\_ Mtrs  
 a) 50      b) 100      c) 40      d) 60

65) What percentage of market value will be fixed as licensing fee for school run by private in Rly land?  
 a) 6%      b) 20%      c) 10%      d) 12%

66) The maximum time limit for giving Railway land on lease to school run by private party is \_\_\_\_\_ years.  
 a) 30      b) 99      c) 20      d) 10

67) The maximum time limit for giving Rly land on lease to Kendriya vidyalaya is— years.  
 a) 99      b) 30      c) 20      d) 10

68) When the railway land is given on lease to state govt for construction of GRP Quarters, what are the charges for license fees are \_\_\_\_\_ of Market Value  
 a) 3%      b) 6%      c) 10%      d) 12%

69) The time limit for licensing the Rly land to state govt for construction of GRP quarters is— \_\_\_\_\_ years  
 a) 99      b) 30      c) 20      d) 10

70) What is the category of encroachments by outsiders which requires PPE Act for removal?  
 a) A      b) B'      c) 'C'      d) 'D'

71) What should be the minimum slope of Bathroom floor towards outlet ?  
 a) 1 in 60      b) 1 in 40      c) 1 in 30      d) 1 in 80

72) What is the periodicity of Section Engineer (Works) should inspect the buildings, water supply installation, sewage installation and drainage arrangements  
 a) Once in year      b) 6 months      c) 9 months

- 73) From what depth of water, the sample is to be collected from open well?  
a) 1 to 2 m from bottom level of well  
b) 1 to 2 m from top level of well  
c) 2 to 3m from bottom level of well
- 74) The requirement of Minimum Residual Pressure in Distribution System for single Storied building at ferrule point is\_\_\_\_\_ Mtr. a) 7 b) 6 c) 2 d) 4
- 75) What is the periodicity of cleaning for water coolers in the offices ?  
a) once in Month b) once in 2 months  
c) once in 9 months d) once in Half yearly
- 76) What is the permissible limit for PH value of drinking water ?  
a) 6.5 to 8.5 b) 4.5 to 6.5 c) 8.5 to 10
- 77) What is the periodical testing & Maintenance of water meters ?  
a) Once in a year b) Once in 6 months  
c) once in 9 months
- 78) What is the recommended super chlorination during the monsoon ? a) 2 PPM  
b) 1 PPM c) 05 PPM
- 79) The minimum contact time of chlorine before delivery of water to the consumer is\_\_\_\_\_ minutes.  
a) 30-60 b) 15-30 c) 60-90 d) 90
- 80) What colour is to be painted on wood work in all important rooms in the health units ?  
a) White b) grey c) blue
- 81) The minimum width of path ways at the ends of platform where there is no FOBs or Sub Ways in the Stations is \_\_\_\_\_ Mtrs?  
a) 2 b) 2.5 c) 1.8 d) 2.4
- 82) The letter size of cabin name boards is \_\_\_\_\_mm.  
a) 300 b) 450 c) 600 d) 250
- 83) What is the category of all Sub Urban stations ?  
a) 'C b) 'D c) 'E d) 'B
- 84) The requirement of water supply to the health units is \_\_\_\_\_Ltrs. Per day.  
a) 450 b) 400 c) 300 d) 200
- 85) minimum height between PF and bottom of the Platform name board of the station is \_\_\_\_\_ Mtrs  
a) 2 b) 2.1 c) 1.8 d) 2.4
- 87) The minimum PF shelter is to be provided on each PF for category A station is \_\_\_\_\_ Sqm.  
a) 400 b) 300 c) 200 d) 250

- 88) How many seats are to be provided for B category station as per the minimum essential amenities?  
a) 75 nos b) 50 nos c) 40nos d) 60nos
- 89) The maximum period of interval in between two cleanings of septic tank———months.  
a) 12 b) 18 c) 6 d) 24
- 90) The maximum period of license for Rly. Land can be given for conducting exhibition, melas, circus shows is —— months.  
a) 3 b) 6 c) 4 d) 12
- 91) The licence of rly Land for conducting the melas, exhibitions and circus etc, is—— % of market value of land  
a) 20% b) 12% c) 16% d) 15%
- 92) Water required for apron washing is \_\_\_\_ Ltrs per Sqm  
a) 10 b) 20 c) 15 d) 25
- 93) Water is required for maintenance of garden per hector of lawn area is \_\_\_\_ Ltrs  
a) 22500 b) 20000 c) 10000 d) 30000
- 94) The height of the projection from the GL of Boundary Posts is \_\_\_\_\_ mm.  
a) 500 b) 600 c) 1000 d) 900
- 95) As per the Recommended Passengers Amenities water coolers are to be provided when passengers are exceeding per a day. a) 1000 b) 2000 c) 5000  
d) 15000
- 96) Mosquito proof shutters should be provided in staff quarters in a) Ty-III and above b) For all types of quarters  
c) For Ty-V only d) For Ty-IV and above
- 99) The Section Engineer(Works) inspects all the buildings, water supply installations and drainage arrangements at least once in—— a) Three years b) 6 months  
c) Two years d) One year
- 100) In Colony Care Committee in big colonies the following Official is one of the member  
a) Sr.DEN/DEN b) ADEN c) DRM d)ADRM
- 101) The complaints in the petty repairs book will be entered by a)  
Station Master b) SE(Works)  
c) Assistant Engineer d) Staff residing in colony.
- 103) The standard measurement book(SMB) will be prepared \_\_\_\_\_ a)before starting the work b) during course of work c)After completing the work  
d) at the time of estimating
- 104) The structural steel register will be entered by  
a)Assistant Engineer b) Divisional Engineer  
c)JE (works) d) Sction Engineer(Works)

- 105) In the toilet flushing cistern, the capacity should be less than \_\_\_\_ gallons  
a) 10    b) 3    c) 5    d) 15
- 106) The revised plinth area of Ty-I quarters is \_\_\_\_ sqm  
a) 45    b) 25.75    c) 83.6    d) 34.00
- 107) The frequency of periodical white washing inside the running room is once in  
a) A year    b) six months    c) 2 years    d) 4 years
- 108) The frequency of periodical distemper in Officers bungalows is once in \_\_\_\_  
a) 4 years    b) a year    c) 2 years    d) six months
- 109) The slope of roof slab in any building shall not be less than  
a) 1 in 60    b) 1 in 30    c) 1 in 100    d) 1 in 50
- 110) Railway sanitation committees are appointed at important station by  
a) ADRM    b) CMS    c) DRM    d) General Manager
- 113) The height of fencing on a platform is \_\_\_\_\_ mtr.  
a) 1.8    b) 1.5    c) 1    d) 1.6
- 114) Large scale covering of platform should not be provided at  
a) Suburban stations    b) Stations in heavy rainfall    c) Junction stations    d) Wayside stations
- 115) The height of letters in Principal & Secondary name boards on platforms is \_\_\_\_ Cm  
a) 15    b) 25    c) 10    d) 30
- 116) All notice boards shall be erected and maintained by \_\_\_\_\_ Department  
a) Engg.    b) Commercial    c) Concerned    d) Medical
- 117) The size of platform number boards shall be \_\_\_\_\_ m square  
a) 300    b) 450    c) 500    d) 600
- 118) For any reference point in yard plan, inter station distance, will be considered from  
a) Centre of platform length    b) Centre of waiting hall  
c) Center point of platform shelter    d) Center of the station building
- 120) The Assistant Engineer will jointly inspect with the Civil Authorities, all RAW/RAT  
a) in January    b) in April    c) in March    d) Before monsoon
- 121) The stores and Offices of subordinates will be inspected by AEN once in \_\_\_\_  
a) a year    b) 3 months    c) 6 months    d) 2 months
- 122) The bridge foundations and substructures shall be inspected by  
a) SE(Works)    b) SE/PWay    c) SE(Bridges)
- 123) The operation and maintenance of carriage watering and carriage washing hydrants is the duty of \_\_\_\_ Department  
a) Medical    b) Operating    c) Engg    d) Mech

- 126) The desirable Ph value for drinking water is  
a)1.0 b) 0.4 to 0.60 c)2 d)6.5 to 8.5
- 127) The required value of residual chlorine in drinking water is — ppm a) 0.1  
b) 0.2-0.6 c) 1.0-1.5 d) 2.0-3.0
- 128) The minimum velocity of sewerage in a sewer pipe line should be \_\_\_\_\_ M/Sec  
a) 1 b) 2 c) 3 d) 4
- 129) In case of urgency when the additional land is required for acquiring by Railway, the application is to be made to  
a)DistCollector b) DRM c) GM d)Supdt of Police
- 130) The original tracings which are duly certified by State Govt. regarding land boundaries should be available in the Office of the  
a)Sr.DEN b)AEN c)SSE (Works) d)CE
- 132) The full form of "PPE" in the land management act is  
a) Public prosecution Encroachment  
b) Public parameter encroachment  
c) Public premises eviction  
d) Procedure for prosecution of encroachment
- 133) At station where SE(Works) not posted, but Inspector/RPF is posted the following Official is responsible for fresh encroachment  
a) Station Master b)Commercial Inspector c)  
Incharge PWI of the section d) Inspector/RPF
- 134) In Type V quarter car garages will be constructed for  
a)All quarters b) 50% of quarters  
c)75% of quarters only d) None of the above
- 135) The minimum curing period for concrete works is \_\_\_\_\_days a) 5 b)  
14 c) 28 d) 10
- 136) In station name boards, the spellings of different languages have to be approved by  
a)Zonal Hqrs. b)Rly. Board c) DRM d)State Government
- 137) The station approach roads will be maintained by Railways  
a)Within Rly. land b)From entry point to the station building c)On cost  
sharing basis with State Govt. d) None of the above
- 138) The category "F" station is \_\_\_\_\_  
a)Station where passenger earnings is less than 01 crore per year b) less than 1  
lakh per year  
c) All suburban stations d) All passengers halt stations
- 139) The ratio of latrines and urinals for Gents and Ladies will be a)2/3:1/3  
b)3/4:1/4 c)1/2:1/2 d)None of the above
- 140) The length and width of the Principal and Secondary name boards on platform will be  
a)3.0x1.20m b)2.75x1.0M c)4.0mx1.5m

- d) To accommodate total written material to be engraved/painted
- 141) The standard slope providing escalators at important station is a) 60° b) 45° c) 30°  
d) None of the above

**Fill in the Blanks:**

- 1) In case of multistoried building in place of dust bins \_\_\_\_\_ are to be provided
- 2) The colour scheme for passenger amenity boards on platforms is \_\_\_\_\_
- 3) The colour scheme for important Offices boards on platforms is \_\_\_\_\_
- 4) The width of trench for sewer line will be \_\_\_\_\_
- 5) In case of any slip or other accident happened to any cutting, embankment or other works Section \_\_\_\_ of the Indian Railway Act 1989 empowers Railway to enter upon any lands
- 6) The flooring in hospital and dispensaries should be \_\_\_\_\_
- 7) In hospital the painting for all wood work will be with \_\_\_\_\_
- 8) The flooring in staff quarters other than Officers will be \_\_\_\_\_
- 9) The plinth area of servants quarters attached to main quarters will be \_\_\_\_\_ Sqm

**True or False question:**

- 1) Railway Rest Houses should not be allotted to non Officials including MPs when their visits are connected with Rly working  
(TRUE/ FALSE)
- 2) Spouse and dependent children and dependents of Officers as permitted in Pass Rules can occupy the Rest Houses (TRUE/ FALSE)
- 3) Raising mains are not to be used for distribution (TRUE/ FALSE)
- 4) There is no ban on licensing land for religious purpose (TRUE/ FALSE)
- 5) The waiting rooms need not be provided at suburban stations ie category 'c' (TRUE/ FALSE)
- 6) In a standard drawing of staff quarters if thickness of wall is increased IS it admissible to increase over all plinth area (TRUE/ FALSE)

**Short answers questions:**

- 1) What is the main factor to be considered to decide height of the plinth of a buildings?
- 2) What are the basic amenities required for each staff quarter?
- 3) After completion of schedule white washing and colour washing when there is change of tendency, is there any provision for further white washing?
- 4) Schedule of colour washing of buildings is will be based on \_\_\_\_\_ ?
- 5) What is the main purpose to extend the slab in buildings up to 30 cm beyond support wall?
- 6) What are the precautions to be taken to prevent leaky roof?
- 7) What is the storage capacity with out stand by pump?
- 8) Where the air valve are placed in a pipe line
- 9) The water supply system should be designed for at least 200 litres for person per day Is it includes flushing requirement?
- 10) What is the criteria to provide water taps in the office buildings?
- 11) The no of water closets required to be provided for office buildings for male & Female are same or different?
- 12) What is the function of septic tank?

- 13) Which section of RlyAct1989 will empowers railway to entering adjoining lands in emergency?
- 14) To whom the section Engineer(works) should inform immediately when unauthorized occupation of subletting is noticed in railway quarter?
- 15) Who will bear the cost of construction of quarters for GRP in Rly Land?
- 16) Who will maintain the RMS building repairs when the building is constructed on deposit work?
- 17) When the blasting operation for blasting of a rock within the 60 mts From track, what protection should be given to track?
- 18) By what means the surplus detonators should be disposed?
- 19) What is the technique of collection and storage of Rainwater at surface or in subsurface a aquifer, before it is lost as surface runoff?
- 20) What is full form of SIG ?
- 21) What are the sludge decomposition, actions will be done in the Septic Tank ?
- 22) What is the name of the reaction done in the Septic tank during digestion period ?
- 23) What is the size of Platform Number sign board?
- 24) What is the House hold consumption of water for officers & Staff quarters per head per day ?
- 25) What is the Equation of PHP ?
- 26) What is the relation between working pressure & Test pressure for using the pumping main ?
- 27) What is the name off the solution used to test the water sample for residual chlorine ?
- 28) What is the Size of the Drawing sheet for the preparation of index plan, section, detailed drawings of ROB, Major bridges etc, ?
- 29) What colour is to be painted to all steel works in Station buildings?
- 30) What is the order of languages exhibited the name of the Station ?
- 31) The location/sitting of buildings or other structures depends upon which factors ?
- 32) When multi-storied qrs Should be planned ?
- 33) Whose permission is to be obtained for construction of independent bungalows ?
- 34) What is the Chief aim of orientation of buildings ?
- 35) What climatic factors affect light and ventilation of a buildings ?
- 36) What are the best solar radiation orientation of a building ?
- 37) What is the safe distance of group latrines and urinals ?
- 38) How dust bins at multi-storied buildings to be provided ?
- 39) Can vender shops/stalls opened in Railway Colonies ?
- 40) What is the Colour of painting of PF Shelters ?
- 41) What is the Colour of painting in all steel work in tanks and stagings ?
- 42) Whose permission is to be obtained for addition or alterations to existing staff quarters ?
- 43) What is the periodicity of submitting vacant quarter – position ?
- 44) What is currency of contract for Civil-Zonal works ?
- 45) What is petty repair Book ?
- 46) How repairs are under-taken at major stations and colonies ?
- 47) Who are the members of Colony Committee ?
- 48) What is the periodicity of Colony Committee meeting ?
- 49) What are the basic agendas of Colony Committee meeting ?
- 50) Who is responsible for maintaining sanitary and hygienic-condition in station yards, staff colonies and their surroundings at less important and way-side stations ?

- 53) What points to be kept in mind while planting shady trees on platforms?
- 54) What are the basic facilities provided for physically – challenged persons ?
- 55) What is the authority for Rly For erecting the buildings in the Rly Land without obtaining the permission from the municipal or cantonment?
- 56) On which sides chinks and Venetian blinds may be provided to hospital, Rest houses etc,?
- 57) In which season repairs or renovation works should not be carried out except pointing and work considered to urgent?
- 58) What is schedule of white washing in kitchen room of running room?
- 59) What is the required shape of the roof for preventing the leakage of the roof?
- 60) What is the vulnerable location for leakage of the slab?
- 61) What is frequency of recategorisation the stations with respect to earnings?
- 62) What is required slope of the PF in case of Island and Its direction?
- 63) What arrangement to be made for crossing the Rly line by the passengers in the absence of FOB/ sub way?
- 64) What is the spacing of tertiary name boards?
- 65) What are the colours used for name boards for principal, secondary and tertiary?
- 66) What is the colourscheme of boards for all types of sign boards for small stations?
- 67) What is main point to be kept in mind for fixing the plinth level of the Main station building?
- 68) What is the detention period will be considered while assess the capacity of the septic tank?
- 69) Why strictly protecting the entry of soap water into Septic Tank?
- 70) What is main function of Water seal in WC pan?
- 71) In what way disinfectants will be introduced to the Septic tank
- 72) What is periodicity of the maintenance of hedges, lawns in the offices, rest houses and colonies?
- 73) How much lawn and hedge can be provided to the officers bungalows and type IV quarters
- 74) What action to be taken if Rly Land occupied by the railway staff unauthorizedly ?
- 75) What is maximum frequency of inspection of encroachments for preventing the fresh encroachments ?
- 76) Who will be responsible for fresh encroachment in case of SE/W is not posted but inspector/RPF is there?
- 77) On what way RPF is responsible while removing the encroachments after discharging by the estate officer?
- 80) What are the appropriate arrangements are to be made for avoiding the RP(UP) act?
- 81) When and where anti- termite treatment to be done?
- 82) What is the main concept of the rain water harvesting?
- 83) How to plan the building to receive the maximum solar heat during winter months?
- 84) What is the authority for mandatory to adopt rain water harvesting system for certain types of buildings?
- 85) What type of foundation is to be provided on loose fine sand, soft silt and expansive clays?
- 86) Who will be the minimum level for supervising the major dismantling work?
- 87) As per the recent railway boards letter what is the new name of the low level platform?
- 88) Sec 3 of RP (UP) act says that?

- 89) What action to be done incase of human bodies found run over?
- 90) What action to be taken by the Rly staff in cases of attempted sabotage ?
- 91) What is meant by anaerobic reaction ? When it will occur?
- 92) What is the treatment recommended for problems of chemical clogging?
- 93) What is the nature of offence according to Sec 146 of Rly Act ?
- 94) Why the buildings/structures should be at boundary of land ?

## Bridge Manual

### Objective Type

- 1) In bridges, flood level gauge should be \_\_\_\_\_ mm wide  
a) 380                      b) 300                      c) 450                      d) 400
- 2) For riveting work, in bridge air pressure of \_\_\_\_\_ kg is required  
a) 5.6 to 7                      b) 5.0 to 5.6                      c) 6.0 to                      d) 7.0 to 8.0
- 3) In girder bridges, painting should be done when relative humidity is above \_\_\_\_\_ %  
a) 90                      b) 95                      c) 80                      d) 70
- 4) Oil bath bearings are generally provided for girders of spans above \_\_\_\_\_ m  
a) 76.2                      b) 45.7                      c) 60                      d) 30.5
- 5) Roller rocker bearings are provided in girders of span \_\_\_\_\_ m and above  
a) 30.5m                      b) 45.7                      c) 18.3                      d) 24.4
- 6) In centralized articulated bearing of girder bridge the minimum expansion is \_\_\_\_\_ mm  
a) 12 to 20                      b) 10-12                      c) 18-20                      d) 20-24
- 7) Max angle of derrick should be \_\_\_\_\_ to the vertical  
a) 45°                      b) 60°                      c) 30°                      d) 75°
- 8) The direction of flow should be distinctly marked in \_\_\_\_\_ colour on abutment or piers  
a) White                      b) Red                      c) Yellow                      d) Black
- 9) The rivets shank should be about \_\_\_\_\_ mm less than the diameter of the drilled hole  
a) 1.5                      b) 1.0                      c) 2                      d) 0.5
- 10) In turned bolt length of turned shank should be more than the grip length of joint by \_\_\_\_\_ mm  
a) 3                      b) 4                      c) 25                      d) 15
- 11) Ratio of dia of drum of the winch to the dia of the wire rope is \_\_\_\_\_  
a) 10:1                      b) 6:1                      c) 12:1                      d) 8:1
- 12) Steel with carbon content of 0.10% to 0.25% is called  
a) Medium carbon steel                      b) Mild steel, low carbon steel  
c) Extra hard steel                      d) High carbon steel
- 13) Steel with carbon content of 0.26% to 0.60% is called  
a) Medium carbon steel                      b) Mild steel, low carbon steel  
c) Extra hard steel                      d) High carbon steel
- 14) Steel with carbon content of 0.60% to 1.25% is called  
a) Medium carbon steel                      b) Mild steel, low carbon steel  
c) Extra hard steel                      d) High carbon steel
- 15) Steel with carbon content of over 1.25% is called  
a) Medium carbon steel                      b) Mild steel, low carbon steel  
c) Extra hard steel                      d) High carbon steel
- 16) The standard length of steel Girder of span 6.1mtr. is \_\_\_\_\_ m  
a) 6.83                      b) 6.1                      c) 6.70                      d) 7.09

- 17) The standard length of steel Girder of span 9.15m is \_\_\_\_\_ m  
a) 9.75      b) 10.1      c) 10.2      d) 9.9
- 18) The standard length of Girder of span 12.2m is \_\_\_\_\_ m  
a) 12.9      b) 13.3      c) 13.0      d) 12.8
- 19) The standard length of steel Girder of span 30.5m is \_\_\_\_\_ m  
a) 32.45      b) 32.2      c) 33.45      d) 31.1
- 20) The standard weight of steel Girder of span 30.5m U/s is \_\_\_\_\_ Tonnes  
a) 111.454      b) 56.16      c) 42.16      d) 52.16
- 21) The standard weight of 50' relieving girder is \_\_\_\_\_ Tonnes  
a) 20.78      b) 18.78      c) 42.16      d) 16.78
- 22) The standard weight of steel Girder of span 45.7m U/s is \_\_\_\_\_ Tonnes  
a) 111.454      b) 91.454      c) 101.454      d) 42.16
- 23) The standard weight of steel Girder of span 61.0m U/s is \_\_\_\_\_  
a) 111.454      b) 191.52      c) 89.454      d) 192.52
- 24) The BIS code for prestressing steel of plain hard drawn steel wire is  
a) IS:1785 (part I)      b) IS:2090      c) IS:6006
- 25) The BIS code for prestressing steel of high tensile steel bar is  
a) IS:1785 (part I)      b) IS:2090      c) IS:6006
- 26) The BIS code for prestressing steel of uncoated stress relieved strand is  
a) IS:1785 (part I)      b) IS:2090      c) IS:6006
- 27) The danger level for small arch bridges of span less than 4.0m is at  
a) top of inside of pipe      b) springing level      c) bottom of slab
- 28) The danger level for box culverts is  
a) top of slab      b) 2/3<sup>rd</sup> height      c) bottom of slab
- 29) The danger level for pipe culverts is  
a) top of inside of pipe      b) 2/3<sup>rd</sup> of dia of pipe      c) top of parapet wall
- 30) In case of painting of steel girder bridges, the maximum time lap between Surface preparation & application of primer coat is \_\_\_\_ hrs.      a) 6      b) 8  
(c) 12      (d) 24
- 31) In case of painting of steel girder bridges, the maximum time lap between Surface preparation & 1st finishing coat in case of patch painting is \_\_\_\_\_ hrs.  
(a) 24      (b) 48      (c) 12      (d) 6
- 32) In case of painting of steel girder bridges, the maximum time lap between primer coat & finishing coat is \_\_\_\_\_  
(a) 1 day      (b) 48 hrs      (c) 7 days      (d) 2 weeks
- 33) In case of painting of steel girder bridges, the maximum time lap between 1st finishing coat & the 2nd finishing coat is  
(a) 2 days      (b) 1 day      (c) 7 days      (d) 12 hrs
- 34) The shelf life of paint - Red, lead ready mixed IS:102 is \_\_\_\_\_ months  
(a) 2      (b) 4      (c) 1      (d) 6

- 35) The shelf life of paint red oxide ready fixed IS:123 is \_\_\_\_\_ months  
(a) 12 (b) 4 (c) 1 (d) 6
- 36) The shelf life of paint -Aluminum IS:2339 where paste and are not mixed is \_\_\_\_\_ months  
(a) 2 (b) 4 (c) 12 (d) 6
- 37) The shelf life of paint Aluminum where paste & oil are mixed is \_\_\_\_\_ months  
(a) 2 (b) 4 (c) 1 (d) 6
- 38) The frequency of inspection of distressed bridge of category No:1 by ADEN/ABE is \_\_\_\_\_  
(a) half yearly (b) yearly (c) 3 months (d) 2 months
- 39) The frequency of inspection of distressed bridge pf category No;1 by DEN/SrDEN's is \_\_\_\_\_  
(a) half yearly (b) yearly (c) 3 months (d) 2 months
- 40) DL & HFL of bridge is painted on side of Abutment or Pier?  
a)Down stream side b)Up stream side  
c)Centre of Pier/Abutment d)None of the above
- 41) method of surface preparation done in case of metallising &epoxy based painting is Girder bridge&?  
a)Manual hand cleaning b)Cleaning with power driven tools  
c)Sand blasting d)Flame cleaning
- 42) Frequency of Greasing to bearings of Girder is Bridges is \_\_\_\_ years  
a)1 b)2 c)3 d)5
- 43) Total No of Coats of paint applied on girder bridges in case of epoxy based painting are finishing coats are?  
a)3 b)4 c)5 coats d)6
- 44) The dia of wire used in metalizing Is\_\_\_\_\_mm?  
a)3 to 5 b)5 to 7 c)7 to 10 d)More than 10
- 45) In case of sound condition of a bridge component the no given as CRN is ?  
a)0 b)1 c)5 d)6
- 46) In no. of digits in case of URN of A major bridge is ?  
a)5 b)6 c)7 d)7
- 47) In Elastomeric bearing, what is used as reinforcement to reduce bulging?  
a)Steel Plate b)Tor Steel Rod  
c)Aluminum Plate d)Plain Steel Rod
- 48) In which type bearings tooth bar is provided?  
a)Sliding Bearings b)Rocker and Roller bearing  
c)Elastomeric bearing d)PTFE Bearings
- 49) In metalized painting at least 1 layer of coating must be apply with in — Hours of blasting?  
a)4 b)12 c)24 d)48
- 50) The channels get twisted symmetrically with regards to its axis  
a)Parallel to Flanges b)Parallel to Flanges  
c)Perpendicular to Flanges d)Perpendicular to Web

- 51) Stiffeners are used in a plate girder  
a) To reduce the compressive stress  
b) To reduce the shear stress  
c) To take the bearing stress  
d) To avoid buckling of web plate
- 52) The minimum pitch of rivet holes of diameter 'd' should not be less than  
a) d                      b) 1.25d                      c) 1.5d                      d) 2.5d
- 53) Camber for RBG through steel girder of span 30.5m is \_\_\_\_\_ mm  
a) 22.3                      b) 41.5                      c) 20.3                      d) 18.4
- 54) Camber for RBG through steel girder of span 45.7m is \_\_\_\_\_ mm  
a) 22.3                      b) 41.5                      c) 43.5                      d) 54.9
- 55) Camber for RBG through steel girder of span 60.1m is \_\_\_\_\_ mm  
a) 22.3                      b) 41.5                      c) 54.9                      d) 56.9
- 56) Camber for plate girders up to 30.5m span is \_\_\_\_\_ mm  
a) 22.3                      b) 0                      c) 16.8                      d) 14.6
- 57) Frequency of painting of steel girder bridges in coastal areas in Eco.Railway?  
a) Every year                      b) Once in 3 years  
c) Once in 5 years                      d) Once on 6 years
- 58) Frequency of painting of steel girder bridges in non coastal areas of E.Co.Railway?  
a) Every year                      b) Once in 3 years  
c) Once in 5 years                      d) Once on 6 years
- 59) Frequency of inspection and rivet testing of Girder Bridges in Branch Line by BRI?  
a) Every year                      b) Once in 3 years  
c) Once in 5 years                      d) Once on 6 years
- 60) Frequency of inspection and rivet testing of Girder Bridges in Main Line by BRI?  
a) Once in 2 years                      b) Once in 3 years  
c) Once in 4 years                      d) Once in 5 years
- 61) Frequency of inspection by BRI in case of early steel girder?  
a) Once in 2 years                      b) Once in 3 years  
c) Once in 4 years                      d) Once in every year
- 62) Where there is no past history of damage or serious threat to bridges having span > 30.5m < 61.00m the DL will be fixed at \_\_\_\_\_ mm below bottom of girder  
a) 600                      b) 750                      c) 1000                      d) 1200
- 63) In which case DL fixed at a distance 1200 mm from bottom of girder?  
a) For span < 6.10 m                      b) For span > 6.10 m < 12.20 m  
c) > 12.20 m < 30.50 m                      d) > 61.0 m
- 64) Maximum speed for category 1 distressed bridge is \_\_\_\_\_ Km/h  
a) 10                      b) 15                      c) 20                      d) 40
- 65) With a percentage increase in carbon in steel, which of the following decreases?  
a) Strength                      b) Hardness                      c) Brittleness                      d) Ductility

- 66) The rivets which are heated and then driven in the field are known as  
a) Power driven shop rivet      b) Power driven field rivets  
c) Hand driven rivets      d) Cold driven rivets
- 67) The gross Dia of a rivet is the diameter of  
a) Cold rivet before driving      b) Rivet after driving  
c) Rivet hole      d) None of these
- 68) A fillet weld may be termed as  
a) Miter Weld      b) Concave Weld  
c) Convex Weld      d) All the above
- 69) A fillet Weld where axis is parallel to the direction of the applied load is known as  
a) Diagonal filler weld      b) End Fillet Weld  
c) Side fillet weld      d) All the above
- 70) The Indian Standard Code which deals with steel structures is  
a) IS:875      b) IS:800      c) IS: 456      d) IS:1893
- 71) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ The equipments are used for inspection of welded bridges  
a) Dye penetration kit      b) Magnetic Crack Detector  
c) Welding gauge      d) All the above

**Fill in the Blanks :**

- 1) The most common technique for repairs to fine Cracks in masonry of bridges is \_\_\_\_\_.
- 2) CRN given for any component of a bridge not inspected during time of Inspection is \_\_\_\_\_.
- 3) CRN given if any component of Bridge doesn't exist is \_\_\_\_\_.
- 4) At locations where replacing rivets is difficult \_\_\_\_\_ bolts of appropriate dia and length may be used.
- 5) After metallising first test shall be \_\_\_\_\_.
- 6) \_\_\_\_\_ is used as lubricating the matting surface in case of PIFE bearing of order bridge.
- 7) The limiting wind velocity should be specified by the CE should not exceed \_\_\_\_\_ Km/h in case of bridges.
- 8) Second hand value of a plant \_\_\_\_\_ if R=Present day price, N=Age of plant, L=Average life of the plant, S=The scrap value (Previously estimated).
- 9) Weight of rivet testing hammer is \_\_\_\_\_ gm.
- 10) \_\_\_\_\_ is used to measure depth of water .
- 11) The size of danger level mark on bridges is \_\_\_\_\_.
- 12) The clear distance between two consecutive sleepers at rail joint over the girder bridge should not exceed \_\_\_\_\_ mm .
- 13) As per RDSO's instructions, additional anchor bolts required for running 25 T axle load trains on KR, RV Line and KK line = \_\_\_\_\_.
- 14) Clearance between guard rail and running rail in all major and minor bridges is \_\_\_\_\_.
- 15) Indian standard specification for structural steels is \_\_\_\_\_.

- 16) Indian standard specification for Galvanized sheets steel is \_\_\_\_\_.
- 17) The steel channel sleeper designed by RDSO bearing Drg. No. \_\_\_\_\_ is suitable for BG and MG.
- 18) In steel channel sleeper the rolling and cutting tolerances shall be in accordance with \_\_\_\_\_.
- 19) As per extent RDSO's instruction In girder bridges normal saddle bolts are to be replaced by \_\_\_\_\_ of property class 66.
- 20) Greasing of bearings of steel girder bridges is to be done with a mixture of graphite and grease normally in the proportion of \_\_\_\_\_.
- 21) The least digit of the URN indicates \_\_\_\_\_.

### Short answers Questions:

- 1) What is danger level of bridges?
- 2) What is shallow foundation of bridges?
- 3) What is deep foundation of bridges?
- 4) What are the defects noticed in sub-structure of bridges?
- 5) What is camber in steel girder?
- 6) Why camber is provided in steel girder?
- 7) What are the reasons mainly attributed with loss camber in steel girder?
- 8) What are the rectification measure for loss of camber due to over stress on of member beyond elastic limit in steel girder?
- 9) What are the rectification method for loss of camber due to over stress on of joint rivets in steel girder?
- 10) What are the rectification method for loss of camber due to loose rivets in steel girder?
- 11) What are the action to be taken when crack in steel works of bridges are detected?
- 12) What is a long term solution to crack in steel member of girder bridges?
- 13) What are the methods of prevention of corrosion of steel girder bridges?
- 14) Why surface preparation is most important in painting of steel girder bridges?
- 15) What are the system of paint adopted for painting of girder bridges in areas where there is no severe corrosion?
- 16) What are the systems of paint adopted for painting of girder bridges in areas where corrosion is severe?
- 17) What are the instruments used to measure DFT?
- 18) What are various defects of Bed block of bridges?
- 19) Which IS code for rolled Steel Structural member of Bridges?
- 20) What is formula for Rivet shank calculation for Snap & Counter Sunk Rivet?
- 21) What is early steel girder?

- 22) What is fatigue Crack?
- 23) What is Creep of Girder?
- 24) What is Afflux?
- 25) What is clearance of free Board?
- 26) What should be diameter of Rivet hole?
- 27) Where are drifts used in bridge work?
- 28) What are the Methods for measurement of Camber ?
- 29) What is Numerical Rating System (NRS) for Bridge Inspection?
- 30) What is the use of relieving spans in the bridge works and what are the spans used in bridge works?
- 31) What is Turfer ?
- 32) What is winch Crab?
- 33) What is Metalizing of steel girders?
- 34) What is air pressure for metalizing of steel girders?
- 35) What is Nozzle position & Nozzle Dia for metallising of steel girders?
- 36) Why phosphor bronze plates are used in sliding bearings in place of steel plate in girder bridges?
- 37) What is Templating in case of girder bridges?
- 38) What are the parameter is to be indicated indicator in bridge name board and where it is fixed from abutment for major bridges?
- 39) What is the anemometer and where it is provided?
- 40) Which type of bearing need not to be greased
- 41) What is formula for length of snap head & counter sunk rivets
- 42) What is the non destructive test for welding?
- 43) How many types of wire ropes are available?
- 44) Why elastomeric bearings are introduced?
- 45) When rehabilitation of bridges is required?
- 46) What are the main components of open web through spans girders?
- 47) What are the secondary members in girders?
- 48) What are the components in riveted plate girders?
- 49) Write the schedule of metallising as per of girder bridges?
- 50) What is main function of bearings of girder bridges?
- 51) What is meant by Tell tales of bridges?
- 52) What is meant by jacketing in bridge works?
- 53) What are the forces acting on the bridges?
- 54) What is the limit of tilt and shift in well foundation of bridges?

## Answers for P.Way Manual

### Objective Type Question:

- 1 ) c) Stock & Tongue  
3 ) a) = 0.4%  
5 ) b) Summit curve  
7 ) a) 20  
9 ) a) With in 10Years  
11 ) c) 350  
13 ) a) 2:1  
15 ) c) 10  
17 ) c)  $(R_m + R_S)/R_m \times R_S$   
19 ) d) 140  
21 ) b) Train travel on curve on lower speed than equilibrium  
22 ) c) 40  
24 ) d) -6 to +20  
26 ) a) 0 degree 20'0"  
28 ) c) TGI  
30 ) b) 36  
32 ) b) 3  
34 ) b) 6  
36 ) b)  $2^{1/2}$   
38 ) b) 4  
40 ) a) for increasing the throw of switch and for better housing of Tongue Rail  
41 ) b) TR & SR have same head width  
43 ) a) 45  
44 ) c) Perpendicular inclined at half angle between normal to straight and curved track in lead portion.  
45 ) c) to prevent serious damages incase of derailment  
46 ) d) DEN  
47 ) a) 2  
49 ) d) CE  
51 ) c) 3.25  
53 ) a) 90 -100  
55 ) b) which rests on insert shoulder  
57 ) c) at mid point and quarter points of tongue rails  
58 ) a) Right end of the sleepers should remain on right side  
59 ) a) Left hand side  
61 ) b) 26.5  
63 ) d) 16  
65 ) b) leading direction  
67 ) c) PWI  
69 ) d) 50  
71 ) c) 2  
73 ) b) 5  
75 ) c) Distance between SRJ and ATS is same as the conventional layout for 52kg, 1 in 12 layout.  
76 ) d) 85,87,62,78,82  
78 ) c) Both a & b  
80 ) d) Only (ii)  
82 ) d) All the above  
84 ) a) 1 in 400  
86 ) c) Only (a)  
2 ) a) 0.0016W  
4 ) c) Circular  
6 ) a) Sag curve  
8 ) a) 4th  
10 ) b) 200  
12 ) d) 4.87  
14 ) a) 4 and above  
16 ) d) All of the above  
18 ) a) 2.5  
20 ) d) all of the above  
23 ) c) >75  
25 ) c) 500  
27 ) b) 0.15  
29 ) b) < 1.0  
31 ) a) Safety  
33 ) b) "B"  
35 ) a) 10  
37 ) d) 115  
39 ) a) measured wear (- 2.5mm)  
42 ) b) 6 & 10  
48 ) c) Month  
50 ) c) 50  
52 ) c) month  
54 ) b) 19  
56 ) d) which rest on rail flange  
60 ) c) 3  
62 ) a) 10  
64 ) a) BOX N  
66 ) a) 525  
68 ) b) 25  
70 ) a) 400  
72 ) d) 1 to 2.5  
74 ) b) 21 to 64  
77 ) c) 10  
79 ) c) 7  
81 ) c) Both a & b  
83 ) c) Squaring, Slewing, gauging, packing  
85 ) c) 2 Cum  
87 ) a) 150X250X2440 mm

- 88 ) d) None of the above      89 ) c) 9mm & 9MM  
90 ) d) 525      91 ) c) 4  
92 ) b) 2,1,1, and 6      93 ) c) 7°  
94 ) d) Both b and c  
95 ) b) Distance between gauge faces of tongue rail and stock rail at the first block connecting tongue rail and stock rail from ATS  
96 ) d) All the above      97 ) b) 6mm below fish bolt hole  
98 ) d) All the above.  
99 ) c) Oiling and greasing of fish plated joints by gang  
100 ) b) Points and crossings      101 ) b) Level crossings  
102 ) c) Both (a) & (b) are correct  
103 ) c) Shout and gesticulate to attract attention of guard and driver  
104 ) c) For all LCs once in three years      105 ) a) Joints on a Bridge  
106 ) a) Mn, C, Si      107 ) a) 3  
108 ) a) a fortnight      109 ) a) 50  
110 ) a) 30      111 ) b) 8  
112 ) c) 5      113 ) b) 8  
114 ) c) 5      115 ) a) ± 3  
116 ) a) 1      117 ) a) 1 in 40.  
118 ) a) 35      119 ) a) 1 in 720  
120 ) a) 45°      121 ) a) 8  
122 ) a) 20      123 ) a) three in three  
124 ) a) 225      125 ) a) 15  
126 ) a) 3      127 ) c) Both a & b  
128 ) a) Post monsoon attention  
129 ) d) End of sleeper to 450mm in side of the rail seats  
130 ) c) More than 50mm.      131 ) c) Not more than 30°  
132 ) c) Three      133 ) a) 4  
134 ) b) 3rd & 10th      135 ) d) 3  
136 ) d) OES      137 ) a) One Joint  
138 ) b) Compressive & lateral      139 ) a) 1 meter long straight edge  
140 ) d) Corrugation  
141 ) c) 680 to 760      142 ) d) 1682  
143 ) a) 20 Nos.      144 ) c) PWI  
145 ) d) 4.67m from rail level.      146 ) b) (ii) & (iii)  
147 ) a) Longitudinal rail bonds      148 ) b) (ii) b & c  
149 ) d) 262.5      150 ) a) Cant excess  
151 ) a) 0.35g      152 ) b) PWS  
153 ) d) 2700 .      154 ) d) 1825  
155 ) a) 15      156 ) d) 22  
157 ) a) 44      158 ) d) 6  
159 ) a) Second sleeper      160 ) a) Two  
161 ) a) 1/3 th span      162 ) a) 10  
163 ) a) 05 to 06 Times      164 ) a) ± 10mm.  
165 ) a) 0.04%      166 ) a) 65  
167 ) a) 950      168 ) a) ± 5.  
169 ) c) 6° 42' 35"      170 ) a) 5 .  
171 ) a) 30 to 60 .      172 ) a) 25mm per 13mtrs.  
173 ) a) At least one rail length  
174 ) a) 8      175 ) c) 5  
176 ) a) 5836      177 ) a) 10 .

- 178 ) a) 30  
180 ) a) 1.8  
181 ) a) 60kg  
183 ) a) 20  
185 ) a) 2 .  
187 ) a) 36  
189 ) a) 6-12  
191 ) a) 20 .  
193 ) a) 50  
195 ) a) 50  
197 ) a) 3000  
199 ) a) Atleast 10 years  
201 ) a) 1 lakh  
203 ) a) 6.1m  
205 ) a) 20 .  
207 ) a) 4  
209 ) a) 250  
211 ) a) 50  
213 ) a) 75  
215 ) a) 4  
217 ) a) 440  
219 ) a) 0.35g  
221 ) a) 7  
223 ) a) 7  
225 ) b) 3  
227 ) a) 5  
229 ) a) 2  
231 ) a) 1 in 200  
232 ) a) 120  
234 ) a) -5mm to +3mm  
236 ) a) 60Kg (New)  
238 ) a) 450  
240 ) a) 9  
242 ) a) 120  
244 ) c) 40  
246 ) a) 350  
248 ) c) 65  
250 ) a) 15  
252 ) c) 6 s  
254 ) a) 35  
256 ) a) appropriate cant  
258 ) a) 1340  
260 ) d) In all cases mentioned in& (C)  
262 ) c) Three sleepers from ATS  
264 ) c) Mate  
266 ) a) -6 to +15mm  
268 ) a) Six  
270 ) a) 41 to 44  
272 ) c) 2  
274 ) a) 350  
276 ) a) 175 .  
278 ) a) Upto 10cm  
280 ) a) 4
- 179 ) a) 6.5 .  
182 ) a) Twice a year  
184 ) a) 11 .  
186 ) a) 6 Rail length  
188 ) a) 90 cm  
190 ) a) 6%  
192 ) a)  $\pm 20$  .  
194 ) a) 100  
196 ) a) 30  
198 ) a) Two rail length  
200 ) a) 10 points  
202 ) a) 3 RP  
204 ) a) 6 m  
206 ) a) 20  
208 ) a) 300  
210 ) a) 1.5  
212 ) a) 14.6  
214 ) a) 20 .  
216 ) a) 600  
218 ) a) every month  
220 ) a) good  
222 ) a) 10  
224 ) a) 5  
226 ) c) 6  
228 ) a) Half an hour  
230 ) a) Key man
- 233 ) a) 150  
235 ) a) 25  
237 ) c) 250  
239 ) a) 15  
241 ) c) 4.5  
243 ) b) 60 to 90  
245 ) a) 600  
247 ) d) 80%  
249 ) a) 50  
251 ) b) 30  
253 ) d) 75  
255 ) c) 55  
257 ) c) 1660  
259 ) b) 1540  
261 ) a) PWI Gr-III  
263 ) c) 4mm ; + 3mm  
265 ) a) -6 to +15mm  
267 ) a) 75 .  
269 ) a) 150  
271 ) a) 1  
273 ) a) 50,000  
275 ) a) 5  
277 ) a) 8°  
279 ) a) 4  
281 ) a) 20

- |       |    |           |       |    |           |
|-------|----|-----------|-------|----|-----------|
| 282 ) | a) | 4         | 283 ) | a) | 1 in 100. |
| 284 ) | a) | 2.8.      | 285 ) | a) | White     |
| 286 ) | b) | Yellow    | 287 ) | c) | Red       |
| 288 ) | a) | 50mm      | 289 ) | a) | 1mm/ 3M   |
| 290 ) | a) | 300 ; 450 | 291 ) | a) | 30        |
| 292 ) | a) | 1 in 400  | 293 ) | a) | 100       |
| 294 ) | a) | 2         | 295 ) | a) | A3        |
| 296 ) | a) | 1200      | 297 ) | a) | 4265      |

### **Answers for Fill in the blanks**

- |    |                                                                |    |                                                                                                  |
|----|----------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------|
| 1  | One fish plate and three bolts without nuts                    | 8  | Section 15                                                                                       |
| 2  | 17.25 & 12.25mm                                                | 10 | 1 in 264                                                                                         |
| 3  | 21.50 Mtrs.                                                    | 12 | Creep                                                                                            |
| 4  | inside face of the web of the inner rail of the curve.         | 14 | 11860/ Re                                                                                        |
| 5  | without cant for a distance of 20mm                            | 16 | 98%                                                                                              |
| 6  | signing the Indemnity bond on stamp paper.                     | 18 | 1:8½                                                                                             |
| 7  | 21 <sup>st</sup> ; 10 <sup>th</sup>                            | 20 | CRS                                                                                              |
| 9  | Half the slew                                                  | 22 | Anchor length                                                                                    |
| 11 | $S = 4.2 L X L / R$                                            | 24 | 71.4 mm                                                                                          |
| 13 | Reducing Slew                                                  | 26 | 51 ; 57                                                                                          |
| 15 | virtual transition                                             | 29 | visibility                                                                                       |
| 17 | 44mm                                                           | 31 | 1                                                                                                |
| 19 | 5300                                                           | 33 | 950                                                                                              |
| 21 | 14:6                                                           | 35 | 38.5                                                                                             |
| 23 | 165, 75, 75                                                    | 37 | 1600                                                                                             |
| 25 | Green                                                          | 38 | Half of the curved tongue rail versine of LH/RH 1 in 8½-point.                                   |
| 27 | Engg, S&T department, traffic dept ;                           | 39 | Catch water drains.                                                                              |
| 28 | B2                                                             | 40 | 50                                                                                               |
| 30 | 2750                                                           | 42 | 75                                                                                               |
| 32 | 20.64                                                          | 44 | Once a week                                                                                      |
| 34 | Left, TTS                                                      | 46 | Once in fortnight.                                                                               |
| 36 | 1675                                                           | 48 | 3.6m                                                                                             |
| 38 | Half of the curved tongue rail versine of LH/RH 1 in 8½-point. | 50 | 2.5                                                                                              |
| 39 | Catch water drains.                                            | 52 | 1                                                                                                |
| 41 | 50                                                             | 54 | Three stars ( * * *)                                                                             |
| 43 | 60                                                             | 56 | Alignment of 7.2m chord in left rail is 13mm at                                                  |
| 45 | Once in fortnight                                              | 57 | 30%                                                                                              |
| 47 | 9.6m                                                           | 58 | 20%                                                                                              |
| 49 | 7.2m                                                           | 60 | 14.6 m is Bogie length.                                                                          |
| 51 | 1.75                                                           | 62 | "Half of the GMT speci                                                                           |
| 53 | 1.5                                                            |    | fied for ordinary track"                                                                         |
| 55 | Two stars ( * * ).                                             | 63 | Cubic parabola.                                                                                  |
|    | 85m from the start of Kilometer.                               | 64 | Virtual transition.                                                                              |
| 57 | 30%                                                            | 65 | " $S = L^2 / 24R$ "                                                                              |
| 59 | 1%                                                             | 66 | Half the amount in the opposite direction, when the track is not disturbed at adjacent stations. |
| 61 | Blanket.                                                       | 67 | "Inside of curve (by an amount of $he/G$ where $h$ = height of vehicle $e$ = SE, $G$ = Gauge)"   |
|    |                                                                | 68 | Normally closed to road traffic.                                                                 |

|    |                                                      |     |                           |
|----|------------------------------------------------------|-----|---------------------------|
| 69 | 160cm from centre line of track at every 2.5 Km.     |     |                           |
| 70 | 30cm                                                 |     |                           |
| 71 | Red Oxide Zinc Chromate primer                       |     |                           |
| 72 | Bituminous emulsion, 175 microns                     | 73  | 5%                        |
| 74 | 6850mm, and 6250mm                                   | 75) | 65mm, 40mm and            |
|    | 20mm                                                 |     |                           |
| 76 | 1.5:1 (H:V).                                         | 77  | 6700mm.                   |
| 78 | 850 to 1100 kg                                       | 79  | 300KG                     |
| 80 | between 6 to 12, more than 12.                       | 81  | $V=0.27\sqrt{R(Ca + Cd)}$ |
| 82 | 600m and 1200m                                       | 83  | half the slew             |
| 84 | 250m, 90m                                            | 85  | 6.5m , 3.25M              |
| 86 | Facilitating expansion. & Contraction of rail joints |     |                           |

### **Answers for True or False**

|       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 )   | TRUE  | 2 )   | TRUE  | 3 )   | TRUE  | 4 )   | TRUE  |
| 5 )   | TRUE  | 6 )   | TRUE  | 7 )   | TRUE  | 8 )   | TRUE  |
| 9 )   | TRUE  | 10 )  | TRUE  | 11 )  | TRUE  | 12 )  | FALSE |
| 13 )  | TRUE  | 14 )  | TRUE  | 15 )  | TRUE  | 16 )  | FALSE |
| 17 )  | FALSE | 18 )  | TRUE  | 19 )  | TRUE  | 20 )  | TRUE  |
| 21 )  | FALSE | 22 )  | TRUE  | 23 )  | FALSE | 24 )  | TRUE  |
| 25 )  | TRUE  | 26 )  | FALSE | 27 )  | TRUE  | 28 )  | FALSE |
| 29 )  | FALSE | 30 )  | TRUE  | 31 )  | TRUE  | 32 )  | TRUE  |
| 33 )  | TRUE  | 34 )  | TRUE  | 35 )  | TRUE  | 36 )  | TRUE  |
| 37 )  | TRUE  | 38 )  | TRUE  | 39 )  | TRUE  | 40 )  | TRUE  |
| 41 )  | TRUE  | 42 )  | FALSE | 43 )  | FALSE | 44 )  | TRUE  |
| 45 )  | TRUE  | 46 )  | FALSE | 47 )  | FALSE | 48 )  | FALSE |
| 49 )  | FALSE | 50 )  | FALSE | 51 )  | TRUE  | 52 )  | TRUE  |
| 53 )  | FALSE | 54 )  | FALSE | 55 )  | TRUE  | 56 )  | FALSE |
| 57 )  | TRUE  | 58 )  | TRUE  | 59 )  | FALSE | 60 )  | FALSE |
| 61 )  | TRUE  | 62 )  | TRUE  | 63 )  | FALSE | 64 )  | TRUE  |
| 65 )  | FALSE | 66 )  | FALSE | 67 )  | TRUE  | 68 )  | FALSE |
| 69 )  | TRUE  | 70 )  | TRUE  | 71 )  | FALSE | 72 )  | TRUE  |
| 73 )  | TRUE  | 74 )  | TRUE  | 75 )  | FALSE | 76 )  | TRUE  |
| 77 )  | FALSE | 78 )  | TRUE  | 79 )  | FALSE | 80 )  | TRUE  |
| 81 )  | TRUE  | 82 )  | TRUE  | 83 )  | FALSE | 84 )  | TRUE  |
| 85 )  | TRUE  | 86 )  | FALSE | 87 )  | TRUE  | 88 )  | FALSE |
| 89 )  | TRUE  | 90 )  | FALSE | 91 )  | TRUE  | 92 )  | TRUE  |
| 93 )  | TRUE  | 94 )  | TRUE  | 95 )  | FALSE | 96 )  | TRUE  |
| 97 )  | TRUE  | 98 )  | TRUE  | 99 )  | FALSE | 100 ) | TRUE  |
| 101 ) | TRUE  | 102 ) | FALSE | 103 ) | FALSE | 104 ) | TRUE  |
| 105 ) | TRUE  | 106 ) | TRUE  | 107 ) | TRUE  | 108 ) | FALSE |
| 109 ) | TRUE  | 110 ) | FALSE | 111 ) | TRUE  | 112 ) | TRUE  |
| 113 ) | TRUE  | 114 ) | FALSE | 115 ) | TRUE  | 116 ) | TRUE  |
| 117 ) | TRUE  | 118 ) | FALSE | 119 ) | FALSE | 120 ) | FALSE |
| 121 ) | TRUE  |       |       |       |       |       |       |

### **Short Questions Answers :**

- 1 By measuring the heel divergence for 1 in 8½ curved switch, which is 182.5mm for 1 in 12 straight switch, it is 133 mm.
- 2 It is deducted to account for slope in casting of wing rails to 1 in 20 cant.
- 3 It hardens the periphery of holes and there by delays the formation of star cracks.
- 4 Induction Voltage for 25KV is upto 2 meters.
- 5 To reduce the resistance of the current to the minimum.

- 6 Failure of insulator or leakage of current switches off the supply from the sub-station.
- 7 For perfect insulation over entire wheel base.
- 8 At a tangent point on the outer side of the curve.
- 9 It will not allow any longitudinal movement due to becoming a rigid structure.
- 10 In case of derailment lateral shift of one wheels over bridge is  $250 \pm 50\text{mm}$  i.e. maximum  $250 + 50 = 300\text{mm}$  i.e. guard rail clearance.
- 11 To achieve the gauge at the toe of switch is equal to nominal gauge +6mm.
- 12 Open web girders of span 30.50m and above are provided with camber. Track on these bridges are to be laid correctly follows of the camber.
- 13 To hold the sleepers properly and to restrict the lateral movement of track.
- 14 The curves having radius less than 400m.
- 15 The gradient is steeper in 1 in 80 outside the facing point or beyond the trailing point & to protect the station yard, in case of failure of trains.
- 16 To guide the train wheels at the un-guarded portion of the Xing.
- 17 The average working speed of Monsoon patrolman is taken as 3.0KMPH . So to cover 5Km. length and 30 minutes rest i.e., (1 Hr. 40Min. + 30Min) + (1 hr. 40 Min. + 30 Min.) + (1hr. 40 Min. + 30min.) + (1 hr. 40Min) = 8 Hrs. 10 minutes .
- 18 If the angle is less than  $45^\circ$ , the visibility problem arises.
- 19 The play of wheels on straight track is 19mm. Gauge of BG track = 1676mm. Axle gauge + thickness of flange of new wheels =  $1600 + (2 \times 28.5) = 1657\text{mm}$  Play =  $1676 - 1657 = 19\text{mm}$ .
- 20 To reduce the play and negotiating forces, there by improving riding quality in the Pts. & Xing zone.
- 21 The rails behind back leg crossing provided with fish bolt hole of size 26.5mm dia meter and drilled at 83mm & 249mm from rail end.
- 22 If 20% or more of sample size records toe load less than 400 Kg which is confirmed from 5% sample size, proposal of TFR is to be initiated.
- 23 During extreme of summer and heavy rainfall.
- 24 IS – 408-1981 Gr.O.
- 25 While initial laying and once in an year in corrosion prone areas and platform lines and once in two years in other locations.
- 26 Having TVU between 50000 & 30000 or line capacity utilization 80% (on single line) and number of road vehicles greater than 1000.
- 27 Special, A and B1 classes.
- 28 Curve board must be fixed at tangent point on the outside of the curve radius of curve, length of curve, length of transition in meters and maximum cant of curve in circular portion in mm.
- 29 Maximum of following three a)  $L = 0.008 C_a \times V_m$  b)  $L = 0.008 C_d \times V_m$  c)  $L = 0.72 C_a$
- 30 Speed at which centrifugal force developed by movement of vehicle on curved track is exactly balance by the cant provided.
- 31 Angle subtended at the center by a chord of 30.5m
- 32 While width of the bridge between the parapet walls shall be filled with ballast upto the top of sleeper level.
- 33 Chamfering will not be in full contract of periphery of elongated bolt hole and hence causes uneven hardening, resulting stress concentration in weaker zone.
- 34 Twice a year
- 35 Hot forged so as to form bulge in the middle part of fish plate conforming to the prevalent wear. These fish plates are used for compensating wear in fish planes.
- 36 When high compressive forces are created in rails associated with inadequacy of lateral resistance at that place.
- 37 Obtuse crossing should be laid square to each other with respect to center line of acute crossings.
- 38 250mm high and 40mm thick

39 1400mm X 400mm  
 40 for gradual elimination and introduction of slope of rail top (1:20) from ordinary PSC track  
 to Fan-shaped layout and vis-versa.  
 41 182.5 and 175  
 42 between Tongue rail and lead rail, toe and heel of crossing  
 43 maximum of 15 mm or 25% of average versine in circular portion.  
 44 Uniform spacing and one Mtr long fish plates should be provided  
 45 Provision of 30 to 60 Cm deep blanket below ballast and provision of sub ballast.  
 46 Where TR & SR have same head width.  
 47 Chipping/cracking aggregating 200 mm within a distance of 1 Mtr, top edge thickness <  
 2mm for a length of 100 mm anywhere upto distance of 1 Mtr  
 48 On traffic density and maximum permissible speed.  
 49 80 to 100 Cm  
 50 Toe load <400kg confirmed by 5% sample size.  
 51 Once in a year.  
 52 RH side.  
 53 Lift is more than 30mm.  
 54 15th OCT to 15th April.  
 55 Td +10oc to Td -30oc.  
 56 Once in every month.  
 57 Average.  
 58 11mts.  
 59 30 KMPH.  
 60 3 KMPH.  
 61 Once in fortnight.  
 62 Once in 10yrs.  
 63 Shamphering to hole.  
 64 Overhauling = Shallow screening + through packing + making up cess  
 65 Normally 3 to 5 years.  
 66 To assess the exact lift at each station to smoothen the sag keeping in mind of ballast  
 availability and obligatory points, it is very essential to do lift as per calculation.  
 67 A spherical washer is used to obtain flush fit of the head of the nut of the bolt with the  
 web of rail, where the shank of bolt is not at right angles to the axis of rail.(i) Switch  
 portion : Provided on the left hand side facing the T/out. (ii) X-ing portion : Both the  
 sides.(iii) Checkrail : Flare sides of x-ing.  
 68 The portion between back leg of X-ing to fouling mark. Should be of the same standard  
 as that on the main line track.  
 69 (i) For 1 in 12 : Normal gauge.(ii) Sharper than 1 in 12:Normal gauge + 6 mm.  
 70 If it is not given, there will be tight gauge at SRJ & discomfort to passengers as kink  
 formation  
 71 Improper gauge & incorrect lead or over all length.  
 72 Under equilibrium speed. Reduced by providing appropriate cant.  
 73 (a) For size and gradation – One for every 100 cum. (b) For Abrasion value, impact value  
 and water absorption test: Ist. Test: on completion of 100 Cu.m. Further tests: One test  
 for every 2,000 Cu.m.  
 74  $TGI = 2UI + TI + GI + 6AI / 10$  (ie. Alignment defect has been given the highest weightage  
 followed by unevenness defect. Hence, priority should be given to attend these two  
 defects first.)  
 75 Equipment provided at JOH to prevent the rattling of Tongue rails between toe and heel  
 under moving wheels & ensure adequate clearance between Tongue & Stock rail.  
 76 "Zero ( Resultant half slew = ?? CC + ?? Vd or the slew on Ist and last is zero)"  
 77 Zero.

78 once in fortnight.  
79 once in month.  
80 2 Years or passage of 100GMT of traffic whichever is earlier.  
81 Resultant degree of the Turnout will become half.  
82 Because of assumption ?  $V_p = ?V_e$ .  
83  $\{+ 5 - (-4)\} / 3 = 3\text{mm} / \text{M}$ .  
84 To keep full section of tapered checkrail portion opposite of throat portion of crossing.  
85 It is measured as the difference in heights of the rail at its end and at a point 30 cm. away from the rail end.  
86 Rail table which develops ridges and hollows.  
87 52 kg-m equivalent to an axial force of 12.5 tonnes.  
88 Deepscreening the ballast section to the full depth in a rail length for 2 to 3 sleepers at every  $\frac{1}{2}$  km to 1 km  
89 under an empty 4 wheeled BG wagon propelled by an engine and moving at walking speed.  
90 Train motor vehicles, Bullock carts, Tongas  $\Rightarrow$  1 unit  
91 The reason is due to wide gauge at the crossings.  
92 The reason for deduction is due to account for slope in casting of wing rail to 1 in 20 cant.  
93 It restores the resiliency and elasticity of the ballast bed, resulting in improved Running quality of track.  
94 To facilitate expansion and contraction of rails, retard wear on the fishing planes of the rail and fish plates, to prevent low joints.  
95 It is due to high contact stresses combined with horizontal forces. The vertical Pressure may be due to heavy axle load, large unsprung mass or under equilibrium Speed on canted track. Spreading of rail table is an indication of over loading on one rail.  
96 The reason is to ascertain the exact position of the hook bolts whether the bolt is holding the girder flange or not during inspection. The arrow grooved on the top end of the hook bolt should be perpendicular (square) to the rail and pointed towards it when the hook bolt holds the girder flange  
97 The reason for staggering the rail joints is due to elbows and kinks are likely to develop if rail joints are laid square.  
98 The reason for staggering the rail joints is due to elbows and kinks are likely to develop if rail joints are laid square.  
99 10 days

## **Answers for LWR Manual**

### **Answers for objective type questions:**

- |     |     |                                                                                                              |     |     |                    |
|-----|-----|--------------------------------------------------------------------------------------------------------------|-----|-----|--------------------|
| 1)  | (a) | DEN                                                                                                          | 2)  | (d) | PWM                |
| 3)  | (a) | Rail sleeper frame                                                                                           | 4)  | (c) | tm +5 to tm+10     |
| 5)  | (a) | td +10 to td-30                                                                                              |     |     |                    |
| 6)  | (c) | do a temporary destressing at 10oC lower than maximum anticipated rail temperature                           |     |     |                    |
| 7)  | (a) | a+b+1mm = 1+(2x25mm)                                                                                         | 8)  | (a) | rail free type     |
| 9)  | (c) | before the onset of the summer season in Feb/March                                                           |     |     |                    |
| 10) | (b) | less than td                                                                                                 | 11) | (c) | Gangmate           |
| 12) | (b) | glued joints of G3L type                                                                                     |     |     |                    |
| 13) | (b) | every 15 days in the two hottest and two coldest months of the year and once in 2 months in remaining period |     |     |                    |
| 14) | (b) | 33mm to 6mm                                                                                                  | 15) | (d) | none of the above  |
| 16) | (d) | CTE                                                                                                          | 17) | (a) | RDSO               |
| 18) | (d) | One No of three rail panel                                                                                   | 19) | (d) | 1:5000             |
| 20) | (a) | Consolidation                                                                                                | 21) | (c) | range of rail temp |
| 22) | (a) | Annual mean temperature                                                                                      | 23) | (c) | rail section, zone |
| 24) | (d) | AE a t/R                                                                                                     | 25) | (a) | 10m                |
| 26) | (a) | Increases                                                                                                    | 27) | (c) | 14                 |
| 28) | (d) | Longitudinal ballast resistance                                                                              |     |     |                    |
| 29) | (c) | 50                                                                                                           | 30) | (c) | 87                 |
| 31) | (c) | Tm+10oC                                                                                                      | 32) | (b) | 2 R                |
| 33) | (c) | 50                                                                                                           | 34) | (c) | 20                 |
| 35) | (c) | 4                                                                                                            | 36) | (c) | 7.5mm              |
| 37) | (a) | defective initial gap                                                                                        | 38) | (b) | 20                 |
| 39) | (b) | 50                                                                                                           | 40) | (d) | fortnightly        |
| 41) | (b) | td+10°C                                                                                                      | 42) | (b) | tip of tongue rail |
| 43) | (b) | ±10                                                                                                          | 44) | (c) | 4                  |
| 45) | (a) | 3                                                                                                            | 46) | (d) | ±20,700            |
| 47) | (b) | 360                                                                                                          | 48) | (a) | 4                  |
| 49) | (a) | All the above                                                                                                | 50) | (a) | 23%                |

|      |     |                                   |      |     |                   |     |         |
|------|-----|-----------------------------------|------|-----|-------------------|-----|---------|
| 51)  | (a) | 36%                               | 52)  | (a) | one block section |     |         |
| 53)  | (a) | 440                               | 54)  | (a) | 36                |     |         |
| 55)  | (a) | (td + 10°C) and (td - 30°C)       | 56)  | (a) | 2243              |     |         |
| 57)  | (a) | 01 in 40                          | 58)  | (a) | 05"               |     |         |
| 59)  | (a) | 875                               | 60)  | (a) | 600               |     |         |
| 61)  | (a) | 300                               | 62)  | (a) | 3000              |     |         |
| 63)  | (a) | (t d + 10 c) to (t d - 20° C)     | 64)  | (a) | 4                 |     |         |
| 65)  | (a) | 3,00,000                          | 66)  | (a) | 25 to 33%         |     |         |
| 67)  | (a) | (t d + 15° C) to (t d - 15° C)    | 68)  | (c) | 10° C             | 69) | (c) 7.5 |
|      |     | 70) (d) Age of sleeper            |      |     |                   |     |         |
| 71)  | (c) | Mate                              | 72)  | (d) | Destressing       |     |         |
| 73)  | (b) | Dial type                         | 74)  | (b) | 5 years           |     |         |
| 75)  | (c) | 215 x 106/215X 106                | 76)  | (c) | LWR/CWR           |     |         |
| 77)  | (c) | Over SEJ & upto 3 rails beyond it |      |     |                   |     |         |
| 78)  | (a) | 1310                              | 79)  | (b) | 30                |     |         |
| 80)  | (d) | 50                                | 81)  | (b) | 15                |     |         |
| 82)  | (d) | PWI                               | 83)  | (a) | 30                |     |         |
| 84)  | (a) | Zone-II                           | 85)  | (a) | 1 in 100          |     |         |
| 86)  | (a) | 4000                              | 87)  | (a) | 300               |     |         |
| 88)  | (a) | 90 R                              | 89)  | (a) | 50                |     |         |
| 90)  | (a) | PWI                               | 91)  | (a) | 3 RP              |     |         |
| 92)  | (a) | One end to other                  | 93)  | (a) | 6.50              |     |         |
| 94)  | (a) | Three                             | 95)  | (a) | Mobile watchman   |     |         |
| 96)  | (a) | 13.74                             | 97)  | (a) | 6                 |     |         |
| 98)  | (a) | 36                                | 99)  | (a) | 2                 |     |         |
| 100) | (a) | 50                                | 101) | (a) | 30                |     |         |
| 102) | (a) | 40                                | 103) | (a) | Mate              |     |         |
| 104) | (a) | 20                                | 105) | (a) | 50                |     |         |

**Answers for Fill in the blank:**

- 1 buckling
- 2 Certificate of competency from PWay training centre
- 3 Destressing
- 4 Creep resistance, Torsional
- 5 Weld / Rail fracture, Excessive gaps on SEJ

### **Answers for True or False**

- |           |           |           |           |
|-----------|-----------|-----------|-----------|
| 1) TRUE   | 2) FALSE  | 3) TRUE   | 4) FALSE  |
| 5) TRUE   | 6) TRUE   | 7) TRUE   | 8) TRUE   |
| 9) TRUE   | 10) TRUE  | 11) FALSE | 12) TRUE  |
| 13) TRUE  | 14) FALSE | 15) FALSE | 16) TRUE  |
| 17) TRUE  | 18) TRUE  | 19) FALSE | 20) TRUE  |
| 21) FALSE | 22) FALSE | 23) TRUE  | 24) FALSE |
| 25) TRUE  | 26) TRUE  | 27) FALSE | 28) TRUE  |
| 29) TRUE  | 30) TRUE  | 31) FALSE | 32) TRUE  |
| 33) TRUE  | 34) Yes   | 35) No    | 36) TRUE  |
| 37) TRUE  | 38) TRUE  | 39) TRUE  | 40) TRUE  |
| 41) FALSE |           |           |           |

### **Answers for short questions:**

- 1 0.29
- 2 Wide gap SEJ has 190mm openings and being provided at Bridge approaches (Drg – RDSO – T-6039 & T-6263).
- 3  $5750 + 6950 + 5920 + 80 = 18700\text{mm}$ .
- 4 7140 mm & 5920 two pieces jointed for making stock.
- 5 40mm on each side.
- 6 Hysteresis curve nothing but a graphical representation of movement of tongue rail of SEJ with respect to temperature.
- 7 i) Rails to be USFD tested and defective rails to be replaced ii Rail ends which are bent, hogged, battered or having a bolt hole crack to be end cropped before welding iii Rails should have a residual life of more than 10 years.
- 8 a) Non observance of specified temperature while doing maintenance operation in LWR B) Scanty of ballast, effecting the lateral and longitudinal ballast resistances C) Missing fittings D) Uneven settling formation resulting in poor alignment of track E) Improper functioning of SEJ.
- 9 Destressing should be done — i When gap at SEJ goes beyond the prescribed limit II When tongue rail/stock rail cross the mean position III After a special operation like deep screening, lifting, TRR, TSR etc IV After restoration of track following an unusual accuracy V If temporary repairs have been done & exceeds 3 per KM.
- 10 General lift provided not more than 50mm for concrete sleepers track and 25mm for other than concrete sleeper track If lifting is required in stages, it can be permitted.
- 11 i) Ensuring proper ballast profile II) Full complement of fastenings and anchors III) Observance of specified rail temperature for maintenance operation IV) Introduction of hot weather patrolling if > temperature is  $(t_d + 20)$  V Controlling mis-alignment of track VI) Keeping close watch in SEJ in extreme temperature VII) Proper repairs of fractures.
- 12 For max movement of SEJ = 190mm (i) 55 Mtrs ii) 45 Mtrs For movement of SEJ = 120mm (i) 20 Mtrs ii) 15 Mtrs.
- 13 Extension =  $L \alpha (t_o - t_p)$
- 14 The length of track required to resist the pull exerted on rails by the rail tensor at temp  $t_p$  For practical purpose it can be taken 2.5m per  $^{\circ}\text{C}$  of  $(t_o - t_p)$ .
- 15 The expansion & contractions occurs with in breathing length only hence LWR changes its behavior in breathing length hence produces many complications.
- 16 The maximum & min rail temp for a continuous period of 5 years shall be ascertained then Average of them will give  $t_m$ .

- 17 The forces created by the loco during hauling or braking called tractive or braking forces, creates extra non uniform stresses in rails in addition to the thermal forces hence it creates unequal stresses in LWR.
- 18 Movement of tongue/stole Rail from one stage to other =  $AEL^2 T^2/4R$ .
- 19 It indicates one or more of following (i)Defective initial gap (ii)Inadequate packing in breathing length (ii)Creep of LWR.
- 20 Since the centre portion of the SEJ ie stock rail is fixed hence the reference marks must be fixed on the initial position of tip of tongue rails on both gaps.
- 21 (1) Perfect squaring of sleepers & fixing of ties(2)Concreting of reference post(3)Reference mark on post by hack saw cutting(4)Greasing of entire screw regularly min once a year(5)Providing wooden chocks under the center portion of gaps of SEJ.
- 22 If the range of rail temp falls with in  $T_d+10^\circ\text{C}$  to  $T_d-20^\circ\text{C}$  the temporary distressing not required if it behaves satisfactorily.
- 23 CWR must be cut in approximate 1 km length LWR's and two temporary buffer rail of length 6.5 m long should be inserted at each cutting location.
- 24 The temp beyond  $T_d+20^\circ\text{C}$  is stipulated for hot weather patrolling and one patrol man for each Km to be deputed on double line section and for two Kms on single line section.
- 25 For max movement of SEJ= 190mm (i) 55 Mtrs ii) 45 Mtrs For movement of SEJ = 120mm ( i) 20 Mtrs ii) 15 Mtrs .
- 26 Rail free fastenings must be used on bridge with LWR since the fastenings must facilitate required movement of rail under pressures of thermal expansions of creeps to avoid these lead on girders .
- 27 Yes, at the approaches towards Rocker bearing the box anchoring should be done to avoid excessive creep of LWR.
- 28 To avoid any creep and transferring of forces from out side length of LWR to bridge.
- 29 Elongation  $Y = L \alpha (t_o - t_p)$  and Total movement =  $W(n-1) + Y_n$  Where  $W_{n-1}$  is the movement of rail at the end of (N-1)th segment,  $Y_n$  = elongation for the called segment.
- 30 Stop dead and start with 10 Kmph.
- 31 After machine tamping.
- 32 LWR can be allowed with SEJ's on each pier for the entire length of bridge and the rail shall be box anchored at the fixed ends of the girder.
- 33 Helmet fitted light arrangement.
- 34 By providing SEJ's at the ends of each LWR and two nos three rail panels to be inserted in between these SEJ's.
- 35 52kg rail, M+7 sleeper density & 300mm clean ballast cushion to be provided.
- 36 LWR may be permitted with the insertion of SEJ's at the both ends of curve at the Minimum distance of 100m from tangent.
- 37  $LB = AE\alpha t/R$  t= variation of temp which is more in zone IV than zone I hence LB increases with zone.
- 38 To provide additional factor of safety against buckling.
- 39 During distressing of LWR through fitting renewal should be carried out.
- 40 Attempt should be made to bring down the rail temperature .

## **Answers for AT Welding Manual**

### **Objective type questions:**

- 1) a) higher grade chemistry
- 2) a) 10 to 12 and 2 to 3
- 3) a) Aluminum
- 4) a) 5
- 5) c) 250
- 6) c) HH
- 7) a) Two teams with in 50Mts distance
- 8) a) 2 to 3
- 9) a) Full length of rail
- 10) a)  $600 \pm 20^{\circ}\text{C}$
- 11) a)  $70 \pm 0.70$  ( $100 \pm 10$ )
- 12) d) 56%
- 13) c) More than 50 years
- 14) a) 72
- 15) d) 50
- 16) c) 40 mm
- 17) c) Magnesite lined Crucible
- 18) d) All the above
- 19) c) Ferro Manganese
- 20) d) All the above
- 21) c) 11.8 Kg
- 22) b)  $600 + 20$
- 23) d) All the above
- 24) c) 17 – 23
- 25) d) All the above
- 26) c) To compensate sagging of molten metal
- 27) c) Super heat
- 28) b) Slag inclusion
- 29) d) 5
- 30) b) 4-6
- 31) d) Early chipping
- 32) d) Three piece dry mould
- 33) b) HH Rails
- 34) d) 2
- 35) d) 8
- 36) c)  $\text{Al}_2\text{O}_3$
- 37) d) 2
- 38) c) Orange Yellow
- 39) d) All the above
- 40) d) AT, FB, Electric Arc, Gas pressure
- 41) a) 2
- 42) b) insufficient heating
- 43) c) Before tapping
- 44) a) Excess gap
- 45) d) Improper mould fixing
- 46) d) Two week
- 47) d) One week

- 48) d) One week
- 49) d) Welding should not be carried out
- 50) b) Split 50 mm portion in 2 parts and weld
- 51) a) 10
- 52) a) 40
- 53) a) 60
- 54) a) 70
- 55) a)  $20 \pm 3$
- 56) a)  $20 \pm 3$
- 57) a) 50
- 58) a) 4 to 5
- 59) a) 300
- 60) a) 4
- 61) a) 4
- 62) d) 1
- 63) a) 1
- 64) a) 30
- 65) a) 50
- 66) a) 2 to 4
- 67) a) 2 to 3
- 68) a) 4
- 69) a) 20
- 70) a) 1%

**Answers for Fill in the blanks :**

- 1) Center line of Mould
- 2) aluminium and iron oxide
- 3) Aluminium oxide and iron

**Short questions Answers :**

- 1) RDSO/TPP/NR, Lucknow
- 2) + 1 mm , - 0.0 mm measured at the end of 1.0 mt straight edge.
- 3) + 0.5 mm measured at centre of 1.0 mtr straight edge
- 4) + 0.4 mm, - 0.0 mm, measured at the end of 10 cm straight edge
- 5) + 0.3 mm over gauge face side of the rail head measured at the centre of 10 cm straight edge
- 6) Lateral wear-6mm for all classes of rails subject to uniform gauge.  
Vertical wear- 9mm for 60Kg, 6mm for 52Kg & 4mm for 90R rails
- 7) i) Drilled holed ends holes should be eliminated ii) Un drilled rail ends should be cropped for minimum 150 mm for AT welding to eliminate heat effect zone.
- 8) For 72 UTS rails – 3 to 4mm, for higher UTS rails – 2 to 2.4mm
- 9) 1 % ie, one lot of 100 joints welded shall be selected randomly
- 10) Vertical—+0.5mm to – 0.0mm Lateral - +0.5mm When checked on 1 meter straight edge
- 11) Dampness, cracks, blocked vents, etc,
- 12) Cutting of wear resistant grade rail by flame cutting
- 13) Too wider gap between rail ends
- 14) Mould fitting defect ie, centre to gap but inclined to vertical
- 15) Due to luting sand too wet
- 16) Pouring without the plug in the position
- 17) Due to usage of incorrect thermit portion as approved for specific rail chemistry

- 18) Pouring off center to the plug
- 19) Mould fitted vertically but off center to the weld gap
- 20) Use of damp crucible or use of damp portion The moisture present reacts with aluminum and results in gross porosity of weld metal
- 21) Welded area and 10 Cms on either side
- 22) 2 % of the total number of joints welded
- 23) 40mm
- 24) Gold Schmidt of Germany
- 25) No
- 26) Magnacite powder
- 27) 50mm
- 28) Steel type box
- 29) Rail tensor
- 30) Asbestos powder and slag
- 31) Dextrin
- 32) Barium peroxide and aluminium
- 33) Conventional AT welding process
- 34) The dia of the hole is greater than 16 mm is called blow hole and the dia is less than 166 mm is Pin hole than 166 mm is Pin hole
- 35) The reaction of the portion is unusual due to moisture in the portion is called Vigorous reaction
- 36) Asbestos powder will avoid direct contact of molten metal to closing pin
- 37) i) Late tapping of the Molten metal ii) Crucible height is more than 50 mm from Fabricated mould
- 38) The bonding of molten metal and parent metal is called fusion
- 39) Excess water in lutting sand causes porosity
- 40) In HH Rail the average hardness of HAZ of the Rail becomes considerably less than the parent rail

## **Answers for USFD Manual**

### **Answers for objective type questions:**

- 1 (a) Non destructive testing
- 2 (c) Above 20
- 3 (d) Once in two years
- 4 (b)  $59 \times 10^3$
- 5 (a) 182
- 6 (c)  $323 \times 10^3$
- 7 (b) Verification of horizontal scale
- 8 (c)  $70^\circ$
- 9 (c) 421
- 10 (a) 8
- 11 (b) 5
- 12 (b) Inspection frequency dependent on the incidence of defects
- 13 (c) XXX with red paint
- 14 (a) Single crystal probe
- 15 (a) Week
- 16 (d) 02
- 17 (c)  $0^\circ$  2 MHz
- 18 (b)  $H = S \sin \theta$
- 19 (a) month
- 20 (c) 08
- 21 (a) M&C/NDT/129/2005
- 22 (a) 2
- 23 (c) At the same frequency specified under NBC
- 24 (d)  $45^\circ$  2MHz
- 25 (a) additional gain of 10 db
- 26 (b) One year
- 27 (b) 30
- 28 (c)  $37^\circ$  (F & B)
- 29 (a) 10
- 30 (b) After passage of 40GMT
- 31 (a) Verification of vertical scale
- 32 (d) 100
- 33 (a) rail ends at fish plated joint
- 34 (b) Loss of signal height equal to or more than 20% of full scale height
- 35 (b) Daily
- 36 (c) GCC
- 37 (a) 411
- 38 (a)  $0^\circ$  normal probe
- 39 (b)  $45^\circ$
- 40 (a) a) Minimum two hours each month
- 41 (a) 02
- 42 (a) once in week
- 43 (a) 08
- 44 (a)  $37^\circ$
- 45 (a) Once in a month
- 46 (a)  $0^\circ$

47 (a) 70°

**Answers for Fill in the Blanks**

- 1 Need based concept
- 2 IMR
- 3 IMR
- 4 IMR
- 5 Oil or grease
- 6 IMR
- 7 IMR
- 8 No
- 9 OBS
- 10 411

**Answers for short questions:**

- 1      45° probe used for testing gas pressure, flash butt welded rail joints and half moon defect in AT welds below the web foot junction and SEJ.
- 2      transverse fissures, transverse cracks from surface defects shelling cracks Flange and head testing of AT welds.
- 3      To detect 5mm dia hole at the web-foot junction.
- 4      To detect 12mm dia hole in the head portion of standard rail.
- 5      To detect a 5mm length saw cut at the bottom location.
- 6      Before conducting Ultra sonic test, every day the instrument should be calibrated, Depth setting range 300mm with the help of 60mm steel cube.
- 7      The flaw position should be replaced by a sound tested rail of length not less than 6m with in 3 days of inspection Till replacement 30 KMPH should be imposed and joggled fish plate to be clamped.
- 8      Rail/Weld to be provided with clamped joggled fish plate with in 3 days Key man to watch during daily patrolling till it is joggled fish plated.
- 9      Impose speed restriction of 30 KMPH or stricter immediately b) protection of defective weld by joggled fish plates using minimum two tight bolts one on each side after which speed restriction can be relaxed up to 75 KMPH c) The defective weld shall be replaced with in 15 days.
- 10     Cracks lesser than 08mm size can not be detected by present arrangement.
- 11     For longitudinal horizontal defects in head, web and foot.
- 12     Any sweeping signal on horizontal base line that does not extend beyond 25 divisions from the left edge of the screen or vice versa shall be recorded as gauge corner cracking (GCC) and not as OBS.
- 13     SE/P-Way/USFD should impose speed restriction of 30 KMPH or stricter and has to ensure protection of defective weld by joggled fish plate using minimum 2 tight clamps/2 far end tight bolts one on each side.
- 14     First periodic test, on completion of one year service life by weld and      subsequent tests after every 40 GMT after first periodic test.
- 15     First periodic test after one year and further tests based on GMT For routes having GMT >45 every 2 years, >30<45 frequency 3 years.
- 16     Testing of 2 to 6 track Km per day.
- 17     500 mm longitudinal wave & 270 mm shear wave.
- 18     Setting of 0° probe with respect to back wall echo from rail foot is considered a better option.
- 19     The ability to detect two closely located defects separately is called the resolving power.

- 20      20mmX 20mm square crystal or 20mm circular crystal.
- 21      5 multiple peaks should be full and 6th should be appear.
- 22      Double rail tester

## **Answers for Track Machine Manual**

### **Answers for objective type questions:**

- |                           |                                          |
|---------------------------|------------------------------------------|
| 1) (a) 150                | 2) a 10-12                               |
| 3) a 04-06                | 4) (a) 20%                               |
| 5) a 110-120              | 6) a 135-140                             |
| 7) (a) 10                 | 8) a 50                                  |
| 9) a 9                    | 10) (a) 14                               |
| 11) a) 2                  | 12) c 40                                 |
| 13) (b) 60                | 14) b 40                                 |
| 15) a 60                  | 16) (a) 60                               |
| 17) a 1 lakhs of traffic  | (18) a 24 m to 40                        |
| 19) (a) 4100              | 20) a 3                                  |
| 21) a 01                  | 22) (a) A-3                              |
| 23) a 120                 | 24) a 32                                 |
| 25) (a) 16                | 28) a 40                                 |
| 29) a 50                  | 30) (a) Once in 3 yrs                    |
| 31) a 140mm X 70 mm       | 32) (a) 30                               |
| 33) a 15                  | 34) a 12 Km                              |
| 35) (b) 1 Km              | 36) a) 1T/Out in three gross block hours |
| 37) (a) 0.3 Km or 1 T/out | (38) a 0.2 Km                            |
| 39) a) 0.3 Km             | 40) (a) Two                              |
| 41) a 772                 | 43) a PWI                                |
| 44) (a) 750               | 45) a 2000                               |
| 46) a 5000                |                                          |

### **Answers for short questions**

- 1 The amount of lift which is given to track while tamping to cover all undulations is called general lift.
- 2 1500.
- 3 Operators to undergo refresher course once in 3 Years, and technician once in 5 years.
- 4 The vertical and lateral clearance for OHE, signal post and other structures should be checked and adjusted before clearing the block. It shall be ensured by supervisor working with track machine that there should be no infringement to signal post, OHE and any other structure as per schedule of dimensions.
- 5 Non cess rail on straight track in double line section and outer rail on curves.
- 6
  - 1) Engine oil pressure at idle speed and full RPM
  - 2) Hydraulic pressure in variation units and leakages

- 3) Functioning of brakes, safety devices
  - 4) Tamping tools , rail clamping discs, cutting chain, cutter bar, wear plates screens , conveyor belts.
- 7
    - a) On PSC sleepers the frequency of tamping is once in two years or passage of 100 GMT of traffic which ever is earlier.
    - b) On other than PSC sleepers frequency of tamping will be once in a year.
  - 8
    - a) Never drive over slope or descending gradients with out putting in to gear and don't switch off gear box key switch.
    - b) Do not let the RPM of engine fall below 1000 and do not switch off the engine before machine stops in gradient sections.
  - 9 Upper screen – 80mm Middle screen – 50 mm Lower screen - 36 mm.
  - 10
    - a) field survey to pin track profile
    - b) Marking of curves
    - c) Heaping of ballast in tamping zone
    - d) Recouplement of fittings & fastenings
    - e) Replacement of broken/damaged sleepers
    - f) Removal of guard & check rails
    - g) Opening on level crossings
  - 11 The regular track maintenance in LWR/CWR shall be confirmed to hours when the rail temperature in between +10°C and to 30°C and shall be completed before set of summer. If rail temperature after maintenance exceeds to +20°C during the period of consolidation of speed restriction of 50 KMPH on BG shall be imposed.
  - 12 One portal crane can lift 13m long prefabricated panel ( 9 tonne).
  - 13 It is a small computer which eliminates the feeding of adjustment values from tables and marking on sleepers. The location of main point i.e. starting of transition, end of transition, transition length, radius super elevation etc are fed in to the computer.
  - 14 Hydraulic oil SS-68.
  - 15 Machine will work with reference to left over error ( i.e. 1/6 left error) on every tamping and accumulated the errors left over. Hence 4 pt lining systems are not preferable for straight track.
  - 16 Smoothing mode 4 pt lining system press ion/design mode 3 pt lining system.
  - 17 A ramp in & Ramp out is 1/1000 to be given on transition for smooth ride of trains.
  - 18
    - 1) Smoothening mode of leveling.
    - 2) Design mode leveling.
  - 19 X- level correction.
  - 20 Indicates x level near tamping zone.
  - 21 Transit correction Recording indication after work.
  - 22 Indicates errors .

- 23 The bypass valve may be not working.
- 24 The lock nut of stroke cylinder piston may be slipped.
- 25 In tamping machine X- level correction is done by lifting track.  
In DGS machine correction is done with application of vertical load on track.
- 26 A lift of 100mm & slew + 300 mm can be achieved.
- 27 On PSC sleepers the frequency of tamping is once in two years or passage of 100 GMT of traffic whichever is earlier.
- 28 Non cess rail on adjacent track on double line and outer rail on curve.
- 29 Allowed to return back in wrong working direction.

### **Answers for Works Manual**

#### **Answers for Objective type questions:**

- |    |    |                                         |    |    |              |
|----|----|-----------------------------------------|----|----|--------------|
| 1  | a) | 5 to 7 years                            | 2  | a) | 45           |
| 3  | a) | Every Year                              | 4  | a) | 2 years      |
| 5  | a) | 6                                       | 6  | a) | 15 to 20 %   |
| 7  | a) | 1200                                    | 8  | a) | C            |
| 9  | a) | 0.6                                     | 10 | a) | 100 Mtr      |
| 11 | a) | 25 or more                              | 12 | a) | Once in year |
| 13 | d) | Once in a six months                    | 14 | a) | 3.00         |
| 15 | a) | 180                                     | 16 | a) | 0.25         |
| 17 | a) | 190                                     | 18 | a) | 15           |
| 19 | a) | 0.90                                    | 20 | a) | 45           |
| 21 | a) | 1.2                                     | 22 | a) | 'B-II'       |
| 23 | b) | b) Minimum essential amenities          | 24 | a) | 12           |
| 25 | b) | b) Desirable amenities                  | 26 | a) | 760 to 840   |
| 27 | c) | c) 1in6                                 | 28 | a) | 1.8          |
| 29 | a) | One tap for two coaches                 |    |    |              |
| 30 | a) | 1/3rd of total requirement on plat form |    |    |              |
| 31 | a) | 600 x 600                               |    |    |              |
| 32 | c) | White figures on blue back ground       |    |    |              |
| 33 | a) | 27                                      |    |    |              |
| 34 | a) | 100                                     | 35 | c) | 1in60        |
| 36 | a) | 1.80 mtrs                               | 37 | a) | 2/3rd of     |
|    |    | test pressure                           |    |    |              |
| 38 | a) | ½ of test pressure                      |    |    |              |
| 39 | a) | Three distribution system               |    |    |              |
| 40 | b) | Grid distribution system                | 41 | a) | 05           |
| 42 | d) | once in a 6 months                      | 43 | a) | 80%          |
| 44 | a) | 100                                     | 45 | a) | 2.5          |
| 46 | a) | Opposite to low of water                | 47 | c) | 30           |
| 48 | a) | 0.2                                     | 49 | a) | 100 ml       |
| 50 | a) | 05                                      | 51 | d) | all          |
| 52 | d) | all above                               | 53 | a) | 0.8          |
| 54 | a) | 2                                       | 55 | b) | 15           |
| 56 | a) | 1 in 60                                 | 57 | a) | 100mm dia    |

- |     |    |                                                              |     |    |                  |
|-----|----|--------------------------------------------------------------|-----|----|------------------|
| 58  | a) | 24 to 48                                                     | 60  | d) | all              |
| 61  | a) | 1-5 yrs                                                      | 62  | a) | 10%              |
| 63  | a) | in April                                                     | 64  | a) | 50               |
| 65  | a) | 6%                                                           | 66  | a) | 30               |
| 67  | a) | 99                                                           | 68  | a) | 3%               |
| 69  | a) | 30                                                           | 70  | a) | A                |
| 71  | a) | 1 in 60                                                      | 72  | a) | Once             |
| 73  | a) | 1 to 2 m from bottom level of well                           | 74  | a) | 7                |
| 75  | a) | Once in a Month                                              | 76  | a) | 6.5 to 8.5       |
| 77  | a) | Once in a year                                               | 78  | a) | 2 PPM            |
| 79  | a) | 30 - 60                                                      | 80  | a) | White            |
| 81  | a) | 2                                                            | 82  | a) | 300              |
| 83  | a) | C                                                            | 84  | a) | 450              |
| 85) | a) | 2                                                            | 87) | a) | 400 sqm          |
| 88  | a) | 75 nos                                                       | 89  | a) | 12               |
| 90  | a) | 3                                                            | 91  | a) | 20%              |
| 92  | a) | 10                                                           | 93  | a) | 22500            |
| 94  | a) | 500                                                          | 95  | a) | 1000             |
| 96  | d) | For Ty-IV and above                                          | 99  | d) | One year         |
| 100 | b) | Assistant Engineer                                           | 101 | a) | Station Master   |
| 103 | c) | After completing the work                                    | 104 | d) | SE(Works)        |
| 105 | b) | 3                                                            | 106 | d) | 34.00            |
| 107 | a) | a year                                                       | 108 | c) | 2 years          |
| 109 | c) | 1 in 100                                                     | 110 | d) | General Manager  |
| 113 | a) | 18                                                           | 114 | d) | Wayside stations |
| 115 | d) | 30                                                           | 116 | a) | Engg             |
| 117 | d) | 600mm square                                                 |     |    |                  |
| 118 | d) | Center of the station building                               |     |    |                  |
| 120 | d) | Before monsoon                                               | 121 | a) | a year           |
| 122 | a) | SE(Works)                                                    | 123 | d) | Mech.            |
| 126 | d) | 6.5 to 8.5                                                   | 127 | b) | 0.2-0.6          |
| 128 | c) | 2                                                            | 129 | a) | Dist. Collector  |
| 130 | d) | CE                                                           |     |    |                  |
| 132 | c) | Public premises eviction                                     | 133 | d) | Inspector/RPF    |
| 134 | c) | 75% of quarters only                                         | 135 | d) | 10 days          |
| 136 | d) | State Government                                             | 137 | a) | Within Rly.      |
|     |    | land                                                         |     |    |                  |
| 138 | d) | All passengers halt stations                                 | 139 | a) | 2/3:1/3          |
| 140 | d) | To accommodate total written material to be engraved/painted |     |    |                  |
| 141 | c) | 30 °                                                         |     |    |                  |

### **Answers for Fill in the blanks**

- 1 Garbage chutes.
- 2 blue letters on white back ground.
- 3 red letters on white back ground.
- 4 dia. of pipe +30cm.
- 5 14
- 6 mosaic or non slippery ceramic tiles
- 7 white colour
- 8 cement concrete
- 9 186

### **Answers for True or False**

- 1 TRUE

- 2 TRUE
- 3 TRUE
- 4 FALSE
- 5 TRUE
- 6 TRUE

**Answers for short questions:**

- 1 Existing drainage system and levels of ground
- 2 Kitchen, individual bathroom, individual latrine and ventilation arrangements
- 3 White washing can be done for kitchen and bath room with the approval of ADEN
- 4 Rain fall per year
- 5 To arrest leakages
- 6 a) Provide adequate slope of 1 in 100 to slab  
b) Provision of slope and drip course in coping
- 7 Higher of a)  $\frac{1}{2}$  of normal consumption in 24 hours  
b)  $\frac{1}{3}$ rd of maximum water consumption in 24 hours
- 8 At summits
- 9 Yes, it includes 45 litres of flushing requirement
- 10 One tap for every hundred person with a minimum of one on each floor
- 11 Different
- 12 It works as a sedimentation and digestion tank
- 13 Section 14 of Railway Act 1989
- 14 quarter allotment authority
- 15 state government
- 16 By railway, the charges will be born by postal dept
- 17 The track should be protected by covering with old wooden sleepers
- 18 By socking them in light mineral oil for 48hrs or by throwing them in deep waters
- 19 Rain Water Harvesting
- 20 Service Improvement Group
- 21 Sedimentation, Digestion
- 22 Anaerobic
- 23 600mm x 600mm
- 24 200 Ltrs per head
- 25  $PHP = L(H+h)4560$
- 26 Working Pressure not greater than Half of the test pressure
- 27 ORTHOTOLODINE
- 28 AO-841MM X 1189MM
- 29 Aluminium, Dark battleship grey
- 30 Regional Language, Hindi & English
- 31 (i) vicinity of tracks inside curves (ii) visibility of drivers of trains or road vehicles at LC's (iii) at land boundary for future developments and to prevent encroachments
- 32 In consideration of land cost/land scarcity
- 33 General Manager
- 34 To provide physically and psychologically comfortable living for the inhabitants
- 35 (i) Natural light and temperature (ii) Prevailing winds (iii) Relative humidity
- 36 The building should receive the maximum solar radiation in winter and minimum in summer

37 These should be located within 15m of Qrs, 30m from – Kitchen, 45m from open  
 well/HTW/DTW and away from public buildings near Rly Colonies

38 Garbage chutes with opening in each floor, with closing arrangements of the openings

39 If shopping facilities are not available nearby, it may be constructed on personal approval  
 of GM

40 Grey, Aluminium or Red

41 Dark battle ship grey or red or aluminium or black enamel

42 Temporary - Sr DEN; Permanent -PCE

43 Every month by SSE/Works to ADEN

44 One year (01/07 of the year 30/06 of next year)

45 it is maintained at way-side stations The station-master will enter repairs required to  
 service buildings and staff quarters in his control and bring it to the notice of SSE/Works  
 who in turn will take up repairs and record compliance in the petty repair book

46 In SSE/Works-HQ Office, a complained book is maintained The occupants of staff  
 quarters can entry the complaints Then the repair works are taken-up

47 ADEN as Chairman, ADMO, HI, SSE/Works, EF, One representative of each of two  
 recognized unions

48 Once in every 2-months with 7-days notice to the members

49 Up-keep and cleanliness of colonies, repair works, water supply and drainage review,  
 Nuisance in the Colony etc

50 Station Master

53 (i) It should not obstruct visibility of signals  
 (ii) It should not infringe SOD  
 (iii) It should not infringe live over-head wires  
 (iv) It should not obstruct platform lights or signs

54 (i) Barrier free entry  
 (ii) Non-slippery pathway from circulating area to platform  
 (iii) A toilet at lower level  
 (iv) A water tap point at lower level  
 (v) Ramp for wheel chair

55 Sec II of the Indian Railways act no :24 of 1989 and the government buildings act no :IV  
 of 1899 read in conjunction with sec 291 of the cantonment act No.11 of 1924.

56 West and south sides

57 monsoon

58 Once in 6 months

59 1 in 100

60 Junction of the roof with parapet wall

61 Once in 5 years

62 1 in 60 and from the center towards coping on either side

63 A path way (minimum width 2M) to be provided connecting the ends of the platform

64 It should be such that at least one name board is visible from any compartment of the  
 standing train

65 Letters in black on traffic yellow back ground

66 Black lettering on white back ground

67 Proposed high level platform

68 24 to 48 hrs detention period for less than 50 persons and 10 to 18 hrs detention period  
 for more than 50 persons

69 Soap water is disinfectant as they kill the organisms which digest sewage

70 To prevent entry of foul gases

71 After cleaning the Septic Tank 3 or 4 shovelful of surface earth containing grass roots  
 and decaying vegetable matter should provided

- 72 Hedges: a) Hedge cutting – once in 2 months;  
b) watering – Once in week till hedges are fully grown and then once in 2 months;  
Lawns: a) Mowing – once in month  
b) Watering – once a fortnight and once a week in summer  
c) Weeding – once a month
- 73 Bungalows Lawn = 200sqm; Hedge = 200 rmt ;  
Type IV qtrs Lawn = 75sqm; Hedge = 100 rmt
- 74 It is grave misconduct and it is fit for SF 5(Major penalty)
- 75 Atleast once in 3 months
- 76 Inspector/RPF
- 77 Law and order to be maintained with consultation of state police/GRP if required
- 80 Issuing of proper issue notes, gate passes & railway challans etc,for railway materials
- 81 At the time of construction from the foundation stage itself
- 82 To raise the water table
- 83 Longer walls should fall north and south
- 84 Section 15 of environment (protection) act 1986
- 85 Raft foundation or on piles taken to a firm stratum
- 86 Sr SE (in – charge) will be nominated by the DyCE/ Sr DEN in writing
- 87 Medium level
- 88 Who ever is found or is proved to have been in possession of any railway property reasonably suspected of having been stolen or unlawfully obtained and shall be punishable unless he proves that the railway property came into his possession lawfully.
- 89 a) If life is extinct, the body shall not be moved more than is necessary to clear the line and a written memo to be given to police by the guard or driver along with required information.  
b) If life is not extinct, the person shall be moved to the next station where medical aid shall be arranged by the station master.
- 90 When ever any offence under section 150 or 151 of the Indian railways act 1989 is detected, the senior most railway official present may direct the police officer or police man or railway servant (if there is no police man present) to arrest the offender at once and then a detailed report should be sent to the appropriate authorities.
- 91 When reaction will take place without oxygen is called anaerobic reaction & It will be occurred in the septic tank.
- 92 Hydrochloric acid or sulphuric acid with inhibitor are added to the well.
- 93 Obstructing Railway Servant in his duty.
- 94 to avoid encroachments.

### Answers for Bridge Manual

#### Answers for objective type Questions:

- |                            |                                     |
|----------------------------|-------------------------------------|
| 1) a) 380                  | 2) a) 5.6 to 7                      |
| 3) a) 90%                  | 4) a) 76.2                          |
| 5) a) 30.5                 | 6) a) 12 to 20                      |
| 7) a) 45°                  | 8) a) White                         |
| 9) a) 1.5                  | 10) a) +3                           |
| 11) a) 10:1                | 12) b) Mild steel, low carbon steel |
| 13) a) Medium carbon steel | 14) d) High carbon steel            |
| 15) c) Extra hard steel    | 16) d) 7.09                         |
| 17) c) 10.2                | 18) b) 13.3                         |
| 19) a) 32.45               | 20) c) 42.16                        |

- |     |     |                                  |     |     |                      |
|-----|-----|----------------------------------|-----|-----|----------------------|
| 21) | d)  | 16.78                            | 22) | a)  | 111.454              |
| 23) | b)  | 191.52                           | 24) | a)  | IS:1785 (part I)     |
| 25) | b)  | IS:2090                          | 26) | c)  | IS:6006              |
| 27) | b)  | springing level                  | 28) | c)  | bottom of slab       |
| 29) | a)  | top of inside of pipe            | 30) | (d) | 24                   |
| 31) | (b) | 48                               | 32) | (c) | 7                    |
| 33) | (c) | 7                                | 34) | (b) | 4                    |
| 35) | (a) | 12                               | 36) | (c) | 12                   |
| 37) | (d) | 4                                | 38) | (d) | 2 months             |
| 39) | (c) | 3                                | 40) | (a) | Down                 |
| 41) | (c) | Sand blasting                    | 42) | (c) | 3                    |
| 43) | (c) | 5                                | 44) | (a) | 3 to 5               |
| 45) | (c) | 5                                | 46) | (d) | 7                    |
| 47) | (a) | Steel Plate                      |     |     |                      |
| 48) | (b) | Rocker and Roller bearing        |     |     |                      |
| 49) | (a) | 4                                |     |     |                      |
| 50) | (b) | Parallel to Flanges<br>web plate | 51) | (d) | To avoid buckling of |
| 52) | (d) | 2.5D                             | 53) | (a) | 22.3                 |
| 54) | (b) | 41.5                             | 55) | (c) | 54.9                 |
| 56) | b)  | 0                                | 57) | (b) | Once in 3 years      |
|     |     | on 6 years                       | 58) | (d) | Once                 |
| 59) | (c) | Once in 5 years                  | 60) | (c) | Once in 4 years      |
| 61) | (d) | Once in every year               | 62) | (b) | 750                  |
| 63) | (d) | > 61.0 m                         |     |     |                      |
| 64) | (b) | 15                               | 65) | (d) | Ductility            |
| 66) | (d) | Cold driven rivets               | 67) | (b) | Rivet after driving  |
| 68) | (d) | All the above                    | 69) | (c) | Side fillet weld     |
| 70) | (b) | IS:800                           | 71) | (d) | All the above        |

#### **Answers for fill in the blanks**

- |     |                                                                                         |     |                       |
|-----|-----------------------------------------------------------------------------------------|-----|-----------------------|
| 1)  | Epoxy Grouting                                                                          | 2)  | 0                     |
| 3)  | 6                                                                                       | 4)  | Turned                |
| 5)  | Wash primer or Etch primer                                                              | 6)  | Silicon grease        |
| 7)  | 72                                                                                      | 8)  | RXN/L x (R-S)         |
| 9)  | 110                                                                                     | 10) | Echo sounder          |
| 11) | Bright red bond 5 cm wide centrally over a white bond 10 cm wide for a length of 60 cms |     |                       |
| 12) | 200                                                                                     | 13) | 4 Nos per span        |
| 14) | BG = 250+_ 50mm,                                                                        | 15) | IS 226,               |
| 16) | IS: 277,                                                                                | 17) | RDSO/B-1636           |
| 18) | IS: 1852                                                                                | 19) | higher strength bolts |
| 20) | graphite and grease in proportion of 1: 1                                               |     |                       |
| 21) | ORN of bridge as a whole.                                                               |     |                       |

#### **Answers for short Questions**

- 1 The danger level is that level which when reached, safety of the bridge is likely to be adversely affected.
- 2 A bridge foundation having less than 2 Mtrs, depth below bed level in case of Arch bridge and 1.2 Mtrs Depth below bed level in case of other bridge is known as shallow foundation.

- 3 A foundation which is deep enough, having required grip length below maximum scour level is termed as the foundation.
- 4 Common defects are (a) Weathering (b) leaching of Mortar, (c) Leaning/bulging of abutments, Wing wall and return wall (d) Cracks in masonry/Concrete.
- 5 It is the vertical Convexity provided to girder, so that the structure assume designed shape when subjected to max. load.
- 6 Steel triangulated (Open web) girders provided camber to compensate deflection under loading.
- 7 a) Over stressing of member beyond elastic limit b) Over stressing of joint rivets c) Loose rivet.
- 8 Strengthen the girder with proper camber or replace the girder.
- 9 The joint should be redesigned and rivets and gusset plates replaced as required after providing the design camber.
- 10 All loose rivets should be replaced by sound rivets and proper camber provided.
- 11 Whenever a crack is detected in steel work its cause should be established and further propagation, if any monitored. As a first remedial step, a small hole of 07mm dia should be drilled at the extremities of the crack to prevent its further propagation.
- 12 As a long term solution the cracked member may be strengthened by cover plates, adequately riveted. The defective members are may have to be taken out and repaired/replaced.
- 13 The preventive methods are: (a) Protective coating by painting (b) Metallising (c) Use of epoxy based paint.
- 14 Because this is a single most important factor in ensuring good performance as the presence of the rust under the paint film can cause its failure. Removal of rust, oil, Grease & Dirt necessary to ensure adequate adhesion of paint film to the surface.
- 15 For priming coat: 1) Heavy coat of ready mixed paint red lead (IS:102) 2) One coat of ready mixed paint Zinc Chromate priming (IS:104) followed by 1 coat of ready mixed paint red oxide zinc chromate priming (IS:2074) or 02 coats of Zinc chromate red oxide primer IRS-P-31 For Finishing coat Two cover coats of Red oxide paint (IS:123) or any other approved paint applied over the primer coats.
- 16 In areas where Corrosion is severe for priming coat:- Two Coats of ready mixed paint Red lead priming to (IS:102) OR One coat of ready mixed paint Zinc chromate Priming (IS:104) Followed by one Coat of Ready mixed paint Red Oxide Zinc Chrome Priming (IS:2074) For finishing Coat: Two coats of Aluminum paint (IS:2339).
- 17 The following instruments used: i) Electronic Coating Thickness gauge ii) Elcometer iii) Surface profile gauge.
- 18 a) Improper seating of bearings b) Shaken Bed block c) Cracking and Crushing of masonry.
- 19 IS: 2062 Grade A or B.
- 20 (i)  $L = G + 1.5D + 1\text{mm}$  for every 4mm grip or part there of Snap Rivet (ii)  $L = G + 0.5D + 1\text{mm}$  for every 4mm grip or part there for Counter Sunk Rivet.
- 21 The Steel manufactured between 1895 & 1905 should be treated as suspected & classified as Early Steel Girder due to higher percentage of phosphorus makes the steel brittle & such Girder can collapse suddenly because of brittle fracture.
- 22 Fatigue is the tendency of metal to fail at a lower stress when subjected to cyclical loading.
- 23 The longitudinal movement of girder is called Creep.
- 24 Afflux is rising in water level up stream of a Bridge due to obstruction of the natural flow caused by construction of bridge.
- 25 The water level of designed discharge including afflux and the point on that bridge.

- 26 The Dia of Rivet hole is made larger than 1.5 mm for Rivet up to 25mm Dia & by 2mm for larger than 25mm Dia Rivets.
- 27 In the work of Riveting for alignment of the holes during the initial assembly drifts are used.
- 28 The Methods are I) Piono wire Method (ii) Dumpy Level Method (iii) Water Level Method.
- 29 The NRS for Bridge Inspection assign a unique Rating Number URN to represent the physical condition of the Bridge. Lower the URN more serious is the deteriorated condition of a Bridge.
- 30 These are duplicate Girders which were during temporary arrangement to pass the Traffic over them while the repairs of Construction works are in progress.
- 31 Tirfor is a portable machine with multiple uses with minimum efforts all sorts of operation can be performed easily that is puling, lifting etc.
- 32 A Winch Crab is a geared machine used for pulling erecting and tensioning of loads with help of wire Ropes.
- 33 In metalized protection base metal like zinc or Aluminum is lost by the atmospheric action, while steel remain unaffected Zinc or Aluminum sprayed on the surface prepared by grit/sand blasting for giving such protection is known as metallising.
- 34 2.109 Kg/Sqcm.
- 35 Nozzle position – at right angle to and approximately 22.5 cm. from surface Nozzle Dia – not exceeding 12m.
- 36 Coefficient of fiction between steel and phosphor bronze is considerably lower.
- 37 Templating is a process of making a drawing of structure to full scale on a pucca floor preferably on a steel sheet.
- 38 On Bridge name boards the following parameters are indicated ( 1) Bridge Number, 2) Name of river , 3) Length of span It was fixed at 15 m away from the abutment in the direction of train movement.
- 39 It is an instrument to measure the flow of wind velocity & it is provide at nearer station of major bridge.
- 40 Phosphor bronze bearings.
- 41 The lengths of Snap Head:  $G + G/8 + 1.5d$ . counter sunk :  $G + G/8 + d$ . Where L = Length of rivet shunk, G = Total grip, d = Dia. of rivet
- 42 X – Ray examination.
- 43 1) Flexible SWR, 2) Normal SWR.
- 44 In the conventional steel bearings , there are problems pertaining to corrosion of metal and freezing of moving parts avoid these disadvantages, elastomeric bearings are introduced.
- 45 Bridges may require rehabilitations on account of various reasons as under 1) physical distress, 2) vulnerability on hydrological considerations,3)use of obsolete/ non standard materials such as early steel girders, laterite stones, cast iron screw piles Etc.
- 46 1) Bottom chord ie L0-L1 or L0-L1-L2, 2) Top Card ie U1-U2 or U0-U1-U3, 3) End Rakers ie L0-U1, 4) Diagonals ie U1-L2 in Tension members L2-U3 in compression members 5) Vertical members i.e. L1-U1.
- 47 Secondary members are those which can be replaces by themselves individually 1) Bottom lateral bracings 2) Top lateral bracings 3) Sway bracings and knees sway 4) Portal bracings and knees portal 5) Corner brackets 6) End stools and end brackets 7) Main gussets 8) Bearings.
- 48 The following are the components of plate girder ( riveted) 1) Built up I sections (including stiffeners) 2) Cross frames 3) Top lateral bracings 4) Bottom lateral bracings, ( provided for span 24.4 Mts and above) 5) Bearings.
- 49 1) One coat of each primer to IS 5666 2) One coat of Zinc chrome primer to IS 104.3) Two coats of aluminium paints to IS 2339.

- 50 1) Bearings transmit the loads received from superstructure including self weight on to the bed blocks of substructure in such a manner that the bearing stress induced on the bed block is within the permissible limits .
- 2) To cater for rotary movements action caused by deflection of super structure. Etc.
- 51 To study the crack pattern, whether the same is increasing or not, dated marks, put at the extremities of the crack is known as tell tales.
- 52 It is a strengthening work where pier or abutment is jacketed by adding extra width, ensuring proper fixing arrangement with the original structure.
- 53 Various types of the forces acting on the bridges are 1) Centrifugal force, 2) frictional force, 3) horizontal force, 4) longitudinal force, 5) raking force and 6) seismic force.
- 54 As far as possible wells shall be sunk without any tilt and shift. A tilt of upto 1 in 100 (1%) and a shift of D/40 subject to a maximum of 150 mm can be permitted.