

QUESTION PAPER No. 1

**WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP
'C' TO GROUP 'B' SERVICE TO THE POST OF AEN(GR. B) AGAINST 30%
QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY
(Assessment Period 2014-15)**

DATE OF EXAMINATION: 08.10.2016

MAXIMUM MARKS: 150

TIME ALLOWED : 03 HRS.

1. Answer total **Six** questions. Any extra question attempted after **Six** will not be evaluated.
2. All questions carry marks as indicated against each.
3. All questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper. Answers should be supplemented with illustrated sketches, wherever required.
4. **Candidates having found writing name/leaving any other identification marks in Answer Sheet shall be liable to be disqualified.**
5. Answer of Objective Type questions having cutting, overwriting, erasing, scoring off a ticked answer in multiple choice and ticking another answer will not be evaluated.
6. Answers may be written either in English or in Hindi.
7. In case of any ambiguity in the Hindi version, the English version is to be considered authentic.

Section I		
Q.1	Write the correct option:-	35x1=35 marks
(i)	In which year of First World War Germany declared war on Russia and France? A. 1914 B. 1915 C. 1916 D. 1917	
(ii)	India has largest deposits of ____ in the world. A. gold B. copper C. mica D. None of the above	

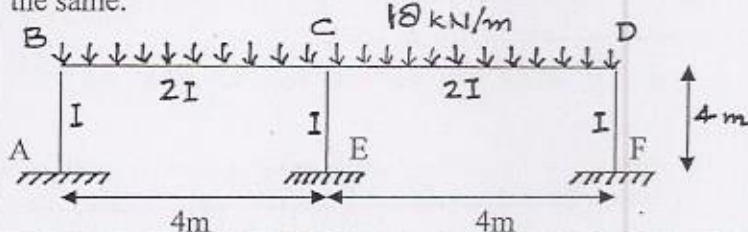
(iii)	India's first Technicolor film _____ in the early 1950s was produced by _____ <u>A.</u> 'Jhansi Ki Rani', Sohrab Modi <u>B.</u> 'Jhansi Ki Rani', Sir Syed Ahmed <u>C.</u> 'Mirza Ghalib', Sohrab Modi <u>D.</u> 'Mirza Ghalib', Munshi Premchand	
(iv)	In which year, terrorists crash two planes into New York's World Trade Centre on September 11 in a sequence of destruction? <u>A.</u> 2000 <u>B.</u> 2001 <u>C.</u> 2002 <u>D.</u> 2003	
(v)	In a normal human body, the total number of red blood cells is <u>A.</u> 15 trillion <u>B.</u> 20 trillion <u>C.</u> 25 trillion <u>D.</u> 30 trillion	
(vi)	India participated in Olympics Hockey in <u>A.</u> 1918 <u>B.</u> 1928 <u>C.</u> 1938 <u>D.</u> 1948	
(vii)	If force is expressed in Newton and the distance in metre, then the work done is expressed in <u>A.</u> Joule <u>B.</u> Kg wt <u>C.</u> Kg wt m <u>D.</u> Watt	
(viii)	Indira Gandhi was assassinated in <u>A.</u> 1974 <u>B.</u> 1984 <u>C.</u> 1994 <u>D.</u> 2004	
(ix)	How many times has Brazil won the World Cup Football Championship? <u>A.</u> Four times <u>B.</u> Twice <u>C.</u> Five times <u>D.</u> Once	

(x)	If speed of rotation of the earth increases, weight of the body <u>A.</u> increases <u>B.</u> remains unchanged <u>C.</u> decreases <u>D.</u> may decrease or increase	
(xi)	India's first nuclear blast at Pokhran in Rajasthan took place in <u>A.</u> 1984 <u>B.</u> 1974 <u>C.</u> 1964 <u>D.</u> 1954	
(xii)	How many players are there on each side in the game of Basketball? <u>A.</u> 4 <u>B.</u> 5 <u>C.</u> 6 <u>D.</u> 7	
(xiii)	In a normal human being, how much time does food take to reach the end of the intestine for complete absorption? <u>A.</u> About 8 hours <u>B.</u> About 12 hours <u>C.</u> About 16 hours <u>D.</u> About 18 hours	
(xiv)	In cricket, the two sets of wickets are <u>A.</u> 18 yards apart <u>B.</u> 20 yards apart <u>C.</u> 22 yards apart <u>D.</u> 24 yards apart	
(xv)	Kiran Bedi received Magsaysay Award for government service in <u>A.</u> 1992 <u>B.</u> 1993 <u>C.</u> 1994 <u>D.</u> 1995	
(xvi)	Logarithm tables were invented by <u>A.</u> John Napier <u>B.</u> John Doe <u>C.</u> John Harrison <u>D.</u> John Douglas	
(xvii)	With which sport is the Jules Rimet trophy associated? <u>A.</u> Basketball <u>B.</u> Football <u>C.</u> Hockey <u>D.</u> Golf	

(xviii)	Joule is the unit of <u>A.</u> temperature <u>B.</u> pressure <u>C.</u> energy <u>D.</u> heat	
(xix)	Kemal Atatürk was <u>A.</u> the first President of Independent Turkey <u>B.</u> the founder of modern Turkey <u>C.</u> revolutionary leader of Soviet Union <u>D.</u> None of the above	
(xx)	Ms. Medha Patkar is associated with the <u>A.</u> Tehri project <u>B.</u> Enron project <u>C.</u> Sardar Sarovar project <u>D.</u> Dabhol project	
(xxi)	Kathakali, Mohiniattam and Ottamthullal are the famous dances of <u>A.</u> Kerala <u>B.</u> Karnataka <u>C.</u> Orissa <u>D.</u> Tamil Nadu	
(xxii)	Jaspal Rana is associated with which of the following games? <u>A.</u> Swimming <u>B.</u> Archery <u>C.</u> Shooting <u>D.</u> Weightlifting	
(xxiii)	Modern Indo-Aryan languages are based on an ancient language called <u>A.</u> Hindi <u>B.</u> Sanskrit <u>C.</u> Kannada <u>D.</u> Tamil	
(xxiv)	Lakshmi Bai National College of Physical Education is located at <u>A.</u> Bhopal <u>B.</u> Gwalior <u>C.</u> Karnal <u>D.</u> Patiala	
(xxv)	Malfunctioning of which of the following organs causes jaundice? <u>A.</u> Stomach <u>B.</u> Pancreas <u>C.</u> Liver <u>D.</u> Kidney	

(xxvi)	Brass gets discoloured in air because of the presence of which of the following gases in air? <u>A.</u> Oxygen <u>B.</u> Hydrogen sulphide <u>C.</u> Carbon dioxide <u>D.</u> Nitrogen	
(xxvii)	Which of the following is a non metal that remains liquid at room temperature? <u>A.</u> Phosphorous <u>B.</u> Bromine <u>C.</u> Chlorine <u>D.</u> Helium	
(xxviii)	Which of the following is used in pencils? <u>A.</u> Graphite <u>B.</u> Silicon <u>C.</u> Charcoal <u>D.</u> Phosphorous	
(xxix)	Chemical formula for water is <u>A.</u> NaAlO_2 <u>B.</u> H_2O <u>C.</u> Al_2O_3 <u>D.</u> CaSiO_3	
(xxx)	The gas usually filled in the electric bulb is <u>A.</u> nitrogen <u>B.</u> hydrogen <u>C.</u> carbon dioxide <u>D.</u> oxygen	
(xxxii)	Washing soda is the common name for <u>A.</u> Sodium carbonate <u>B.</u> Calcium bicarbonate <u>C.</u> Sodium bicarbonate <u>D.</u> Calcium carbonate	
(xxxiii)	Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next? <u>A.</u> 22 <u>B.</u> 24 <u>C.</u> 25 <u>D.</u> 26	
(xxxiii)	Look at this series: 53, 53, 40, 40, 27, 27, ... What number should come next? <u>A.</u> 12 <u>B.</u> 14 <u>C.</u> 27 <u>D.</u> 53	

(xxxiv)	To design a cross-over between parallel tracks, the required components are : A. two switch, points, two acute angle crossings and two check rails B. two switch points, two acute angle crossings and four check rails C. two switch points, two acute angle crossings and six check rails D. none of these	
(xxxv)	The first Indian railway was laid in A. 1775 B. 1804 C. 1825 D. 1853	
प्र.2.(i) ✓	क, ख, और ग क्षेत्र में आने वाले चार-चार राज्यों के नाम बताएं। जम्मू एवं कश्मीर किस क्षेत्र में आता है।	3x5=15 अंक
(ii)	राजभाषा के अधिनियम 1963 की धारा 3 (3) के अंतर्गत आने वाले सभी दस्तावेजों के नाम लिखें।	
(iii)	राजभाषा और राष्ट्रभाषा के बीच क्या अंतर है। 14 सितम्बर का क्या महत्व है।	
Or		
Q.2	Give the full form of : (i) IRCEP (ii) TMS (iii) LRSBB (iv) PMIS (v) RORACS (vi) KRCL (vii) UNESCO (viii) PSAMS (ix) CRIS (x) IRPSM (xi) DFCCIL (xii) PQRS (xiii) SAARC (xiv) UNO (xv) COIS	15x1=15 marks
Section II Attempt any two questions:-		
Q.3 ✓	Design a R-C column of size 450 mm x 600 mm subject to axial load of 2000 kN under service load condition. Unsupported length of column is 3 m, use M 25 concrete and Fe 415 steel. Assume $l_{eff} = l$	25marks

Q.4 ✓	<p>Analyse the single storey two bay portal frame shown in Figure below and draw the bending moment diagram for the same:</p> 	25marks									
Q.5 ✓	<p>A straight tunnel is to run between two points A & B whose coordinates are as under:</p> <table border="1" data-bbox="563 656 1002 768"> <thead> <tr> <th>Point</th><th>Northing</th><th>Easting</th></tr> </thead> <tbody> <tr> <td>A</td><td>0.0</td><td>0.0</td></tr> <tr> <td>B</td><td>3000m</td><td>250m</td></tr> </tbody> </table> <p>A shaft is to be sunk at a point D which is at the middle of AB. As it is impossible to measure along AB directly, the point D is to be fixed from another point C whose coordinates are 1760m northing and 1395 m easting.</p> <p>Calculate:</p> <ol style="list-style-type: none"> The coordinates of D, the length and bearing of CD, and the angle ACD, if the bearing of AC is $38^{\circ}30'$ east of north 	Point	Northing	Easting	A	0.0	0.0	B	3000m	250m	25marks
Point	Northing	Easting									
A	0.0	0.0									
B	3000m	250m									
<p>Section III: Attempt any two questions:</p>											
Q.6 ✓	<p>A vertical pipe carrying oil of specific gravity 0.8 tapers uniformly from 20cm diameter at the lower section to 10cm diameter at the upper sections. The vertical distance between the sections is 1m. The pressure gauges installed at the lower and upper section read 6N/cm^2 and 5N/cm^2 respectively when the discharge of oil is 30 litre/sec. Calculate the loss of head between the two sections. Determine the direction of flow also.</p>	25marks									
Q.7 (i)	<p>Write short notes on Pot bearings and Elastomeric bearings. Under what situations should Engineers use Pot bearings instead of Elastomeric bearings?</p>	12marks									
(ii)	<p>Write brief notes on the tests prescribed for testing shear strength of soil. In determining the effective stress parameters of a soil sample, which test is preferable, consolidated un-drained test or consolidated drained test?</p>	13marks									

Q.8(i)	Are there any differences in the methods of compaction between clayey soil material and sandy material? Please write brief on different compaction methods for different kinds of soil.	13marks
(ii)	Write short notes on any three of the following: a) Ready mixed concrete (RMC) b) Steps involved in mix design of concrete c) Difference between RCC & PSC with merits and demerits of both and their usage in actual structures. d) Safe bearing capacity e) Optimum moisture content	12marks



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DATE OF EXAMINATION: 08.10.2016

MAXIMUM MARKS: 150

TIME ALLOWED : 03 HRS.

1. Answer total **Six** questions. Any extra question attempted after **Six** will not be evaluated.
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7. In case of any ambiguity in the Hindi version, the English version is to be considered authentic.

Section I

Attempt any two:-

Q.1(i)	Describe AEN's power for imposing major penalty and suspension	12½ marks
(ii)	Describe different Major Penalties as per D & AR Rules.	12½ marks
Q.2	Write short notes on any five : (a) New Pension Scheme (b) Difference between Selection, Suitability and Trade Test. (c) Productivity Linked Bonus (d) House Building Advance (e) Minor Penalties under D&AR Rules. (f) Fabrication of insitu glued joints. (g) Variation of contracts and its sanctioning powers	5x5=25 marks
Q.3	Make out a complete dimensional sketch for 1 in 12 RH turn out 60Kg on PRC sleepers and write down the complete set of fittings required to assemble it.	25marks

Section II**Attempt any two:-**

Q.4	Write short notes on any five : (a) Causes of rail fractures and measures required to prevent them. (b) Increasing the speed of the section from 80 kmph to 110 kmph. (c) Measures to improve the running of the section i.e. reduction in acceleration peaks and increase in TGI values. (d) Numerical ratings of condition of bridges (e) Comparative merits and demerits of AT welding vis a vis Flash Butt Welding of Rails. (f) Supervision and Inspection of welds for quality. (g) What are A,B,C,D,E & D Spl. Categories of Track?	5x5=25 marks
Q.5	USFD testing of rails and welds, types of probes used and their applicability, classification of defects, criteria for imposing speed restrictions, fish plating and removal of such rails/welds. What percentage of rail section is tested by USFD machines? Its present day limitations, can scabbed rails be tested by USFD?	25marks
Q.6(i)	Draw the General Arrangement Drawing (GAD) for a ROB of four lanes on electrified territory over two railway lines with two future tracks. Railway tracks are at 5.3 m track centre.	5 marks
(ii)	Please state the provisions of Works Manual Para No. etc. and Railway Board's guidelines for NOC required for building any structure adjacent to Railway Boundary in private land.	5 marks
(iii)	Rules for licensing/leasing of Railway land for different purposes to private parties and PSUs.	5 marks
(iv)	State any 10 provisions of CE circular 629 on standard dimensions for Buildings.	5 marks
(v)	GR/NR's instructions on action to be taken by SSE/P.Way on reporting of jerks by train drivers during night.	5 marks

Section III**Attempt any two:-**

Q.7	Write short notes on any five: (a) CE Circular No. 315(R-I) (b) CE Circular No. 268 (R-II) (c) CE Circular No. 269	5x5= 25 marks
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	<p>(d) Criteria for sanctioning a Rail Renewal (P) in existing running line.</p> <p>(e) Describe with sketch the layout of a PQRS depot. Also describe the PQRS working at site including QAP for depot/site.</p> <p>(f) What is desirable output for PQRS work at site per month and minimum track length under restriction?</p> <p>(g) GR provisions related to Monsoon Patrolling.</p>	
Q.8 (i)	Elaborate the difference between three point and four point lining system of a tamping machine. Also detail the advantages & disadvantages.	13marks
(ii)	<p>Write short notes on any three:</p> <p>(a) What is the prescribed schedule of inspection of track machines by Open Line officials?</p> <p>(b) What are the equipments which should be available on track machines during block working to meet the exigencies?</p> <p>(c) Describe the duties of track machine operators.</p> <p>(d) Route learning of track machine operators.</p> <p>(e) Information brief to be kept during trailing window inspection (CE Circular No. 316)</p>	3x4=12 marks
Q.9(i)	Design a water supply scheme for a railway colony of 500 houses in 50 five storey blocks with population of 2500. Draw sketch showing storage location, capacity and height and pipe line grid with sizes of pipes. Colony is laid in five parallel rows of 10 blocks each. Assume other data.	10marks
(ii)	What is the effect of excess SE, Excess Cant deficiency and inadequate transition length on curves?	5 marks
(iii)	Elaborate precautions to be taken in fabrication and fixing of channel sleepers and its fittings for ensuring proper alignment of track over bridges.	10marks

QUESTION PAPER NO.1
FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION
FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF
AEN (GROUP 'B') AGAINST 30% QUOTA
IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY

DATE OF EXAMINATION -

22.07.2012

Maximum Marks: 150

Time allowed : 03 Hours

NOTES:

- (1) **Answer total six Questions. There are three sections in this paper. Answer maximum two questions from each Section.**
- (2) **All questions carry equal marks and as indicated against the questions.**
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SECTION - I

Q.1 A

- (1) हिन्दी में 'प्रवीणता प्राप्त' की परिभाषा बताएं। (15)
- (2) राजभाषा की नीति को लागू करने की दृष्टि से भारत को किन-किन क्षेत्रों में बांटा गया है, उदाहरण के साथ बताएं। (3)
- (3) कर्मचारियों को सरकारी कामकाज में हिन्दी का अधिकाधिक प्रयोग करने के लिए प्रेरित करने के उद्देश्य से किन्हीं चार पुरस्कार योजनाओं के नाम बताएं। (6)
- (4) राजभाषा अधिनियम की धारा 3 (3) के अनुसार ऐसे चार प्रकार के कागज-पत्रों का नाम बताएं, जिनमें हिन्दी और अंग्रेजी दोनों का प्रयोग अनिवार्य है। (4)

Q.1 B (i) Give the full form of the following:

- | | | | |
|-----------|-------------|--------------|---------------|
| (i) RLDA | (ii) UNO | (iii) WHO | (iv) BSNL |
| (v) FOIS | (vi) DFCCIL | (vii) CONCOR | (viii) IRICEN |
| (ix) NHRC | (x) UNESCO | | |

(5)

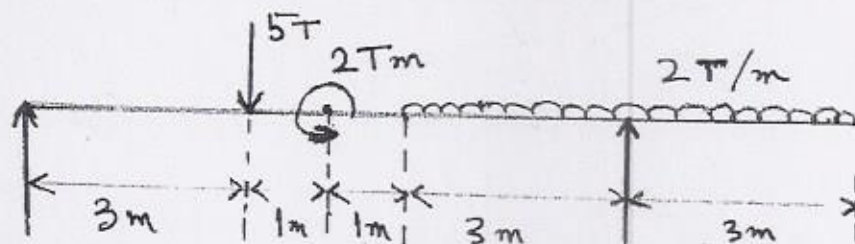
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- Q.1 B(ii) Answer any five:- (5)
- What is the minimum age to qualify for election to the Lok Sabha?
 - What is the term of members of the Rajya Sabha?
 - In which year was the first line of Indian Railways opened?
 - In which city is CAMTECH situated?
 - In which city was the last Olympic held?
 - What is highest speed of train in India?
 - In which State is the longest tunnel under construction in Indian Railways?
- Q.2 A rolled steel joist of I-section has following dimensions; (25)
 overall height :50cm,
 Flanges: 20cm wide and 2 cm thick, Web: 1cm thick.
 It is simply supported on a span of 8m and carries uniformly distributed load of 300N per meter.
 Calculate the maximum stress produced in steel due to bending.
- Q.3 Write short note on any five:- (5 x 5)
- Checking of verticality of tubewells.
 - Rainwater harvesting through recharge pit (with sketches).
 - PERT chart and Bar chart.
 - Chlorination of water using chlorine gas.
 - Ready Mix Concrete (RMC).
 - Acceptance Criteria for Concrete.
 - Steps involved in Mix Design of Concrete.

SECTION – II

- Q.4 Draw bending moment and shear force diagram and find maximum and minimum values of bending moment and shear force. (25)



- Q.5 Write short note on any three:- (8.33 x 3)
- "Total station" for surveying – main components and advantage of use.
 - Pile Load Test: method and acceptance criteria.
 - Purpose and use of any two types of "Admixture" used in concrete.
 - Contour Map.

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(2/3)

- Q.6 Answer any three:- (8.33 x 3)
- (i) Method and precautions of laying Vacuum Dewatered Concrete on Railway Platform surface.
 - (ii) Describe two commonly used methods of water proofing of roof with sketches.
 - (iii) Short note on Potability of water.
 - (iv) Describe in short the types of main machines used in construction of earthen embankment.

SECTION – III

- Q.7 (i) What are various "categories" of stations on Indian Railway for provision of Passenger Amenities? Explain the criteria for categorization of station. (5 x 5)
- (ii) Enumerate Ten Minimum Essential Amenity required at a "B" category Railway station.
- (iii) What are preferred types of trees and shrubs to be used on Railway platform and station area?
- (iv) What are safety precautions taken while constructing FOB across track in Electrified area?
- Q.8 (i) Explain the principle of pre-stressing of concrete. (12½)
Give advantages and disadvantages of using pre-stressed concrete.
- (ii) (a) What are types of pile foundation? – Explain with sketches. (6½)
(ii) (b) When pile foundation is preferred? (6)
- Q.9 Design a RCC Cantilever 3m long beam (projecting from a RCC column) to carry a point load of 5 tonnes at free end (Suitably assume all relevant datas). (25)

K3/2

QUESTION PAPER NO.2

FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION
FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF
AEN (GROUP 'B') AGAINST 30% QUOTA
IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY

DATE OF EXAMINATION - 22.07.2012

Maximum Marks: 150

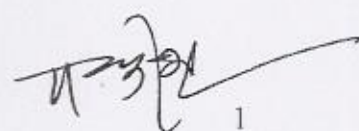
Time allowed : 03 Hours

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SECTION – I

- Q.1 (i) (a) Describe in detailed, the procedure for imposing a major penalty for long unauthorized absence of a group 'D' railway employee under Discipline and Appeal Rules. (10)
- (i) (b) Describe the opportunities available to such an employee for appeal and review of the penalty imposed on him. (5)
- ✓(ii) Write short note on:- (5)
- (a) New Pension Scheme (NPS).
- (b) Staff Benefit Fund (SBF).
- ✓(iii) What is the difference between selection, suitability test and trade test? (5)
- Q.2 (i) What are the various works requiring the sanction of Commissioner of Railway Safety? (10)


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- (ii) What are the items of working of CSM track m/c to be checked by Sectional P. Way Inspectors before starting of the work by machine? (7)
 - (iii) Describe in brief the guidelines for Tamping by Tie-Tamping machines in 'design mode'. (8)
- Q.3
- (i) Why chamfering of bolt holes in rail is required? Describe the method of chamfering in brief. (10)
 - (ii) Enumerate the track laying standards to be achieved during primary renewal of track. (10)
 - (iii) What are specifications for "physical" properties of ballast for a BG Track? (5)

SECTION - II

- Q.4
- (i) (A) For portable accelerometer / OMS2000 (for BG track) what are (3x2)
 - (a) Frequency of its recording?
 - (b) Recording limits of defect?
 - (c) What are classification of track quality?
 - (i) (B) How these information are used to plan attention to track? (4)
 - (ii) On what factors does the gap in SEJ depend? (5)
 - (iii) What are the criteria for planning distressing of LWR during maintenance? (10)
- Q.5
- (i) What is "compensation for curvature" in gradient of track and why it is provided? (5)
 - (ii) How much a ruling gradient of 1 in 200 should be flattened for curve of 0.5 degree on BG track? (10)
 - (iii) A curve of 700m radius on a railway track has a limited transition of 40m length. Find the maximum permissible speed and super elevation on the curve (appropriate data may be suitably assumed). (10)
- Q.6 Draw a neat dimensional sketch of the following :-
- (i) Cross section of a double line BG straight LWR track in 3m deep cutting along with ballast profile, drainage, PRC sleeper and rail. (15)

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- (ii) Sketch showing location of different types of speed boards for BG track on single line for 30 kmph speed restriction imposed on track of 500m length. (10)

SECTION - III

Q.7 Write short notes on :- (5x5)

- (i) Inspection and maintenance of deep cutting.
- (ii) Condition rating number (CRN) and overall rating system (ORN) of bridges.
- (iii) Elastomeric bearings and PTFE bearings in bridges (with sketch).
- (iv) Replacement of loose rivets and precautions to be taken in replacement in bridges.
- (v) Periodicity of special inspections of distressed bridges by officers and specific items to be seen during such inspections.

Q.8 (i) What are the main hydraulic, mechanical and electrical systems in a CSM09-32 Tamping machine? Describe them in brief. (10)

(ii) What are different schedule/periodicity of inspection and maintenance of UNIMAT points and crossing tamper machine? Describe them in brief. (7)

(iii) Describe the method of working of a BCM for deep screening of points and crossing in electrified area. (8)

Q.9 Describe the following:- (5x5)

- (i) Abstract Estimate.
- (ii) Detailed Estimate.
- (iii) Revised Estimate
- (iv) Completion report.
- (v) Reconnaissance survey

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QUESTION PAPER No. 1

FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF AEN (GROUP 'B') AGAINST 30% QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.

DATE OF EXAMINATION

: 02.08.2009

Maximum Marks: 150

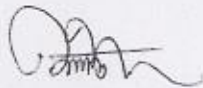
Time Allowed: 03 Hrs.

1. Answer total five questions. There are three sections in this paper. Select at least two questions from section I, at least one question from section II & at least one question from section III.
2. All questions carry equal marks and as per indicated against each.
3. All the questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper. No mobile phone should be in your possession.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

SECTION - I

प्रश्न -1 A

- (क) राजभाषा कार्यान्वय समितियों का गठन किस-किस स्तर पर किया गया है? इन समितियों की बैठक कितने समय बाद होती है? 4
- (ख) हिन्दी शिक्षण योजना के अंतर्गत कर्मचारियों के लिए कौन-कौन सी निर्धारित परीक्षा है और उनका शैक्षिक स्तर क्या है? 4
- (ग) हिन्दी की निर्धारित परीक्षा पास करने पर किसी कर्मचारी को क्या-क्या प्रोत्साहन मिलते हैं? 4
- (घ) राजभाषा नियमों के अंतर्गत क, ख, तथा ग क्षेत्रों से क्या अभिप्राय है। 4
- (ङ) राजभाषा तथा राष्ट्रभाषा में क्या अंतर है? 4



Q. 1B (i) Give the full forms of the following:- (5)

- (a) RSPB
- (b) IPWE
- (c) ~~RDSO~~
- (d) UIC
- (e) ~~ADB~~
- (f) ~~MRTS~~
- (g) KRCL
- (h) RVNL
- (i) ~~FOIS~~
- (j) ~~MAGLEV~~

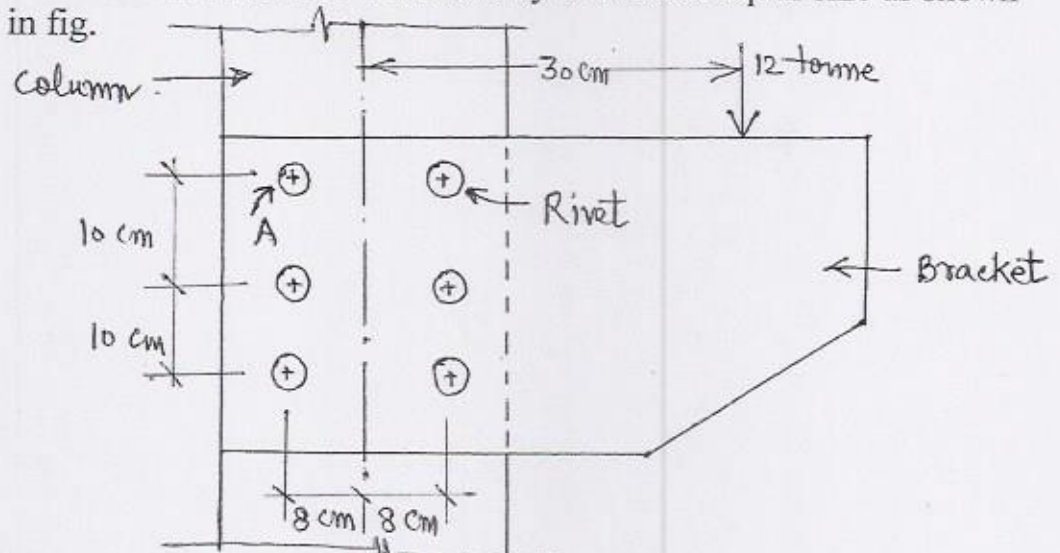
CRIS
SNCF
~~UIC~~ DFCCIL
~~IRCON~~
PQRS
SAARC
UNO
COIS

Q.1B (ii) Name the following:- (5)

- (a) State in which "Rajaji National Park" is located?
- (b) The person who wrote the National Anthem - "Jana Gana Mana"?
- (c) First person in the world to land on the moon
- (d) First Commander in Chief of free India
- (e) Longest river in the world

Q. 2

A bracket is rivetted to a column by 6 rivets of equal size as shown in fig.



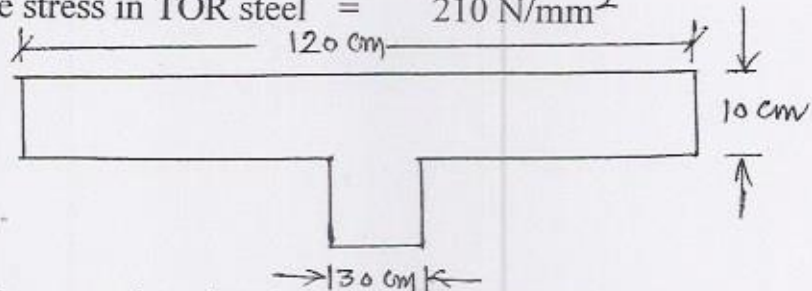
It carries a load of 12 tonnes at a distance of 30 cm. from the centre of the column. Calculate the load carried by rivet marked 'A'.

(30)

Q. 3

Calculate the requirement of reinforcement bars (20mm ϕ) in numbers and the depth of the T-beam for the following section, if it is subjected to a combined live load as well as dead load of 20000 N/m and if the span of the beam is 4m. Assume that Neutral axis lies in the slab portion itself. M-20 grade of concrete and TOR steel is used.

Allowable stress in conc. = 7 N/mm^2
 Allowable stress in TOR steel = 210 N/mm^2



Redraw above section showing depth of the beam and bars. (30)

Q. 4

- For water supply arrangements what is chlorination of water and super chlorination of water. (8)
- Describe with sketches the difference between a tube well and a Ranney well (infiltration galleries). (8)
- Describe with sketch the most commonly adopted type of bio-latrines & also a bio-gas plant (unit). (7)
- Show with sketches the differences between P.trap & S trap in a European type water closet (WC). (7)

SECTION – II

Q. 5

A brick pier 600 mm x 600 mm is 4 m high. It has to carry one axial load of 520 KN. The allowable bearing capacity of the soil on which the pier is to rest is 250 KN/m^2 . The weight of brick masonry is 18.84 KN/m^3 . The angle of repose is 30° and the weight of earth is 16 KN/m^3 .

Design a suitable foundation for the pier. (30)

Q. 6

Write short notes on the following: -

(6 x5=30)

- (i) Requirement of good form work
- (ii) Water proofing of flat roofs
- (iii) Active and Passive earth pressure
- (iv) Atterberg Limits
- (v) Optimum Moisture Content
- (vi) Safe Bearing Capacity and Allowable Bearing Pressure

Q. 7

Answer the following: -

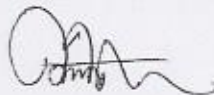
(6 x5=30)

- (i) Advantages and Limitation of Plane Table Survey
- (ii) An angle A was measured by different persons and following are the values:

Angle	No.of measurements
70° 30'	2
70°29'	3
70°28'	4
70°27'	1

Find the most probable value of the angle.

- (iii) Define the following terms used for Theodolite Survey
 - (a) Centering
 - (b) Line of Collimation
 - (c) Double Sighting
- (iv) What are important uses of contours?
- (v) Name the different methods for setting a simple curve.
- (vi) Digital Terrain Modeling



SECTION-III

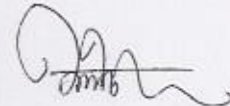
Q. 8 Write short notes on the following: - (6 x 5 = 30)

- (i) Maximum dry density
- (ii) Norms for providing passenger amenities - Minimum essential amenities, recommended level amenities and desirable amenities at Railway Stations
- (iii) Standard Penetration Test (SPT)
- (iv) Advantages and Disadvantages of Centrifugal pumps
- (v) Chlorination and chlorinators
- (vi) Water Cement Ratio

Q. 9 (i) What is a Septic Tank? Draw a neat sectional elevation of a septic Tank. (15)

(ii) Design a septic tank for a small colony of 100 persons with daily sewage flow of 135 litres per head per day. (15)

✓ Q.10 Design a water supply scheme for a railway colony of 400 houses in 50 four storey blocks with population of 2000. Draw sketch showing storage location, capacity & height and pipe line grid with sizes of pipes. Colony is laid in five parallel rows of 10 blocks each. Assume other datas. (30)



QUESTION PAPER No. II

**FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM
GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF AEN (GROUP 'B')
AGAINST 30% QUOTA IN CIVIL ENGINEERING DEPARTMENT,
NORTHERN RAILWAY.**

DATE OF EXAMINATION : 02.08.2009

Maximum Marks: 150

Time Allowed: 03 Hrs.

1. Answer total five questions. There are two parts in the Question Paper – Part-A & Part-B. Attempt minimum two questions from each Part.
2. All questions carry equal marks and as per indicated against each.
3. All the questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

.....
Part – A

- Q.1 (a) Describe in detail the procedure for imposing a major penalty on a Group 'D' railway employee under Discipline & Appeal Rules for long unauthorized absence. 15
- (b) Describe AEN's powers for imposing major penalties and suspension. 7½
- (c) Describe the opportunities available to an employee for appeal and review of the penalty imposed on him. 7½
- Q.2 Write short notes on the following:-
- (i) Completion Report of Work
 - (ii) Project Report on Track Work
 - (iii) Distressed bridges and the schedule of inspection thereof by various officials.
 - (iv) Realignment of curves
 - (v) Frequency of USFD testing of weld flange and rails over girder bridges. 5 x 6 = 30

N.R.V.

Q.3 (a) As AEN, you have been asked to submit a proposal for inclusion in Works Programme 2010-11 for construction of 50 Type-II and 50 Type-III quarters at your Hd.Qrs. station. Write justification abstract cost as per prescribed format indicating chargeable Plan Head with a covering letter addressed to your DEN/Sr.DEN. 15

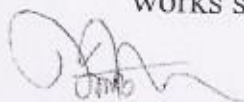
(b) Explain the duties of an Assistant Engineer as the first officer at the site of major accident of a passenger train. Give the sequence of various duties to be performed. 15

- Q.4 (a) Minimum height of a heavy overhead structure (say ROB) above rail level in electrified territory. (5)
- (b) What are minimum and maximum clearances between check rails and running rails on a BG level crossing? (5)
- (c) Height above rail level for a BG high level and medium level passenger platform. (5)
- (d) Horizontal distance between the centre of a track and edge of coping of high level platform on BG. (5)
- (e) What is the slope at the end of a high level passenger platform given to taper of the platform? (5)
- (f) What is the minimum distance between centre of BG track and the nearest pier or abutment of a ROB in a running track? (5)

Part -B

Q. 5 Attempt any six of the following:- (6 x5 =30)

- (a) What is the difference between Engineering & Traffic Level Xings?
- (b) How are the categories C, B, A & A 'Spl' given to a level crossing? What is the criteria?
- (c) Explain various Indicator Boards for temporary restrictions with the help of sketch & distance from works site at which these are fixed in case of BG.



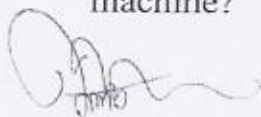
- (d) What action is a SSE (P.Way) (PWI Incharge) required to take in case of a derailment on the section where sabotage or miscreant activity is the prima facie cause of accident?
- (e) Briefly describe the string line method of curve realignment.
- (f) What are General & Subsidiary Rules of a railway and what are the issues concerning Engg.Deptt. mentioned in the same?
- (g) What is the difference between push trolley, motor trolley and material lorry? How is the material lorry loaded with rails to be worked out and how is push trolley to be worked in section with limited visibility?

Q.6

Describe in detail, relaying of track with PQRS relaying system. Give the complete schematic planning to keep restrictions on minimum length. What steps you will take for quality control? (30)

Q.7

- (a) What are the main hydraulic, mechanical and electrical systems in a Unimat points & crossing tamper? Give purpose of each in brief. (6)
- (b) Describe working of track machines in track circuited and in electrified areas. (6)
- (c) What are the daily, weekly and other periodic inspection & maintenance schedules of a CSM 09-32 TT machines? How these are done and who is responsible for the same? (6)
- (d) What are the main differences between ballast cleaning machine, shoulder ballast cleaning machine and points & crossings ballast cleaning machine? (6)



- (e) Describe the working of T-28 (points & crossings renewals) machines with example of a renewal of one point in single line electrified sections. (6)

Q.8

Write short notes on any six of the following:- (6x5=30)

- (a) Types of bearings on bridges
- (b) Camber in Girder Bridges
- (c) Duties of SE Bridges
- (d) Oiling and greasing of bridge bearings
- (e) Painting of steel structures and girders
- (f) Major, Minor and Important Bridges
- (g) Distressed Bridge

Q.9

Write short notes on any six of the following:- (6X5=30)

- (a) New building materials now available in the market
- (b) Horticulture cadre in the Railways
- (c) Damp-proofing Course
- (d) Schedule of white-washing of railway houses and service buildings
- (e) Non-scheduled items
- (f) Analysis of Rates
- (g) Maintenance and operation of Water Supply Installations



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✓
QUESTION PAPER No. 1

FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF AEN (GROUP 'B') AGAINST 30% QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.

DATE OF EXAMINATION

: 05.09.2008

(Sh. Shankar Lal Meena)
for selection of PWJ/NWR

Maximum Marks: 150

Time Allowed: 03 Hrs.

1. Answer total five questions. Question no. 1 is compulsory. In addition, there are three sections in this paper. At least one question must be selected from each section.
2. All questions carry equal marks and as per indicated against each.
3. All the questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper. No mobile phone, ~~calculator~~ should be in your possession.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

.....

प्रश्न -1 A

- (क) राजभाषा कार्यान्वय समितियों का गठन किस-किस स्तर पर किया गया है? इन समितियों की बैठक कितने समय बाद होती है? 5
- (ख) हिन्दी शिक्षण योजना के अंतर्गत कर्मचारियों के लिए कौन-कौन सी निर्धारित परीक्षा है और उनका शैक्षिक स्तर क्या है? 5
- (ग) राजभाषा नियमों के अंतर्गत क, ख, तथा ग से क्या अभिप्राय है। 5

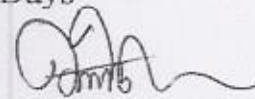
1.B

- (i) The Universal Law of Gravitation was propounded by

- | | |
|---------------|-------------|
| (a) Kepler | (b) Newton |
| (c) Arya Bhat | (d) Galileo |

- (ii) The period of revolution of a geostationary satellite is

- | | |
|--------------|--------------|
| (a) 24 Hours | (b) 12 Hours |
| (c) 30 Days | (e) 365 Days |



(iii) Sound cannot travel through

- | | |
|------------|------------------|
| (a) Water | (b) Steel |
| (c) Vacuum | (d) Hydrogen Gas |

(iv) Cooking Gas is a mixture of

- | | |
|--|--|
| (a) $\text{CO} + \text{CO}_2$ | (b) $\text{C}_4\text{H}_{10} + \text{C}_3\text{H}_8$ |
| (c) $\text{CH}_4 + \text{C}_6\text{H}_6$ | (d) $\text{O}_2 + \text{CO}_2$ |

(v) Constitution of India came into force on

- | | |
|----------------------|---------------------|
| (a) 26 January 1950 | (b) 26 January 1949 |
| (c) 26 November 1949 | (d) 15 August 1947 |

(vi) The first Asian Games were held at

- | | |
|-------------|---------------|
| (a) Manila | (b) Tokyo |
| (c) Jakarta | (d) New Delhi |

(vii) Gopi Chand plays

- | | |
|------------|---------------|
| (a) Tennis | (b) Badminton |
| (c) Chess | (d) Hockey |

(viii) Rajaji National Park is located in the State of

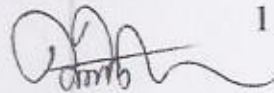
- | | |
|-------------------|---------------------|
| (a) Kerala | (b) Madhya Pradesh |
| (c) Uttar Pradesh | (e) Jammu & Kashmir |

(ix) National Anthem "Jana Gana Mana" is written by

- | | |
|--------------------|---------------------|
| (a) Mahatma Gandhi | (b) R.N. Tagore |
| (c) Pandit Nehru | (d) B.C. Chatterjee |

(x) Bangalore is the capital of

- | | |
|----------------|---------------|
| (a) Tamil Nadu | (b) Karnataka |
| (c) Rajasthan | (d) Kerala |



1.5 x 10 = 15

SECTION - I

Q. 2. A rolled steel joist of I section has the following dimensions:-

Flanges	-	300mm wide and 30mm thick
Web	-	10mm thick
Height	-	600 mm

Above RSJ, as a beam carries a uniformly distributed load of 5 tonnes per metre run on a span of 8 meters. Calculate the maximum stress produced due to bending. (30)

Q. 3 (a) Design a simply supported rectangular reinforced concrete beam of span 6 m. The beam has to carry a load of 8000 N/M including self-weight. Show by sketch the reinforcement required. (20)

(b) What is slenderness ratio in a column and describe what is effective length of a column. (10)

Q. 4 (a) Describe controlled concrete and also the procedure of designing concrete mix for a particular strength say M-40. (10)

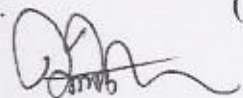
(b) How is prestressed concrete different from plain reinforced concrete? Give in brief merits & demerits of both and the main usages of prestressed concrete. (10)

(c) How is water cement ratio important in any type of concreting? How can we achieve high workability of concrete with low water cement ratio and under what circumstances is this needed. (10)

SECTION - II

Q.5 A brick pier 600 mm x 600 mm is 4 m high. It has to carry on axial load of 520 KN. The allowable bearing capacity of the soil on which the pier is to rest is 250 KN/m². The weight of brick masonry is 18.84 KN/m³. The angle of repose is 30° and the weight of earth is 16 KN/m³.

Design a suitable foundation for the pier. (30)



Q. 6

Write short notes on any four:-

(7.5 x 4 = 30)

- (i) Atterberg limits
- (ii) Dynamic Testing of soils
- (iii) Portable Nuclear compaction gauge
- (iv) Laser Particle size analyser
- (v) Sub-surface Interface Radar System
- (vi) Geophones.

Q. 7

Answer any four:-

(7.5 x 4 = 30)

- (i) Advantages and Limitation of Plane Table Survey
- (ii) An angle A was measured by different persons and following are the values:

Angle	No. of measurements
70° 30'	2
70° 29'	3
70° 28'	4
70° 27'	1

Find the most probable value of the angle.

- (iii) Define the following terms used for Theodolite Survey
 - (a) Centering
 - (b) Line of Collimation
 - (c) Double Sighting
- (iv) What are important uses of contours?
- (v) Name the different methods for setting a simple curve.

SECTION-III

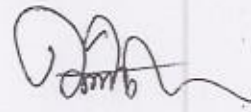
Q. 8 Write short notes on any four:-

7.5 x 4 = 30

- (i) Water Borne Disease
- (ii) Infiltration Galleries
- (iii) Advantages and Disadvantages of Centrifugal pumps
- (iv) Standard Plate Count Test
- (v) Chlorination of Water



- Q. 9 (i) What is a Septic Tank? Draw a neat sectional elevation of a septic Tank. (15)
- (ii) Design a septic tank for a small colony of 100 persons with daily sewage flow of 135 litres per head per day. (15)
- Q.10 Design a water supply scheme for a railway colony of 400 quarters at Railway station dealing passengers per day upto 10000. Assume that quarters have a flushing system. Colony has a central garden of 4 hectares. Assume other datas. (30)



-1-

QUESTION PAPER No. II

FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF AEN (GROUP 'B') AGAINST 30% QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.

DATE OF EXAMINATION

: 05.09.2008

Maximum Marks: 150

Time Allowed: 03 Hrs.

1. Answer total six questions. Question Nos. 1 to 3 of Part A are compulsory. Attempt any 3 questions from Part B.
2. All questions carry equal marks and as per indicated against each.
3. All the questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

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Part – A (Compulsory)

- Q.1 (a) What procedure is required to be followed under D&AR Rules to remove a Group 'D' employee from the Railway services? 10
- (b) What are the amounts and conditions under which the advances for the purchase of (i) Motor Car (ii) Motor Cycle/Scooter are granted? 7 ½
- (c) Write short notes on:-
- (i) Staff Benefit Fund (ii) Leave on Medical Certificate
(iii) Productivity Linked Bonus 7 ½



Q.2 Write short notes on the following:-

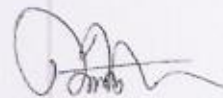
- (i) Urgency Certificate
- (ii) Railway affecting works
- (iii) Distressed bridges and the schedule of inspection thereof by various officials.
- (iv) Comparative merits and demerits of AT Welding and flash butt welding for rails.
- (v) Frequency of USFD testing of weld flange and rails over girder bridges.

5 x 5 = 25

- Q.3 (a) What are the main duties of Assistant Engineer? 7 ½
- (b) What are the inspections to be carried out by an Assistant Engineer on Open Line and their frequency? 7 ½
- (c) Explain the duties of an Assistant Engineer as the first officer at the site of major accident of a passenger train. Give the sequence of various duties to be performed. 10

Part - B (Non compulsory)

- Question No.1 (a) What are A, B, C, D, E, D Spl. & E Spl. Categories of Track? (4)
- (b) What are criteria for sanctioning a track renewal in an existing running line? (4)
- (c) Describe TSR, TRR, CTR, TWR, TBTR, TFR in brief and also describe which of these can be done with second hand serviceable material? (4)
- (d) What are mechanical methods of carrying out TSR, CTR, Pts. & Xings renewals? What are the machines in use on IR at present? (4)

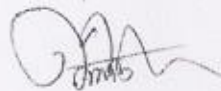


- (e) Describe with sketch the layout & working of PQRS Depot. (4)
- (f) Describe with sketch the various speed restrictions imposed to carry out CTR (P) work with PQRS in a double line section which is being attended with machine tampers. (5)

Question 2

Attempt any five of the following:- (5 x 5 = 25)

- (a) What are the various Indicator Boards of temporary restrictions required?
- (b) What is the procedure for blocking the track for carrying out normal & emergency repairs to track?
- (c) What action is a SSE (P.Way) (PWI Incharge) required to take in case of a derailment on the section where sabotage or miscreant activity is the prima facie cause of accident?
- (d) Briefly describe the string line method of curve realignment.
- (e) What are General & Subsidiary Rules of a railway and what are the issues concerning Engg.Deptt. mentioned in the same?
- (f) How is the good running on level crossing, points & crossings to be ensured?
- (g) What is the difference between push trolley, motor trolley and material lorry? How is the material lorry loaded with rails to be worked out and how is push trolley to be worked in section with limited visibility?



Question 3

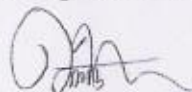
An open web turnout steel bridge of 250 ft. (76m) span is to be launched from abutment to abutment. There is no intermediate support possible. Describe with sketches the method of launching the same & the main item of checks and cautions to be observed. (25)

Question 4

- (a) What are the main hydraulic, mechanical and electrical systems in a Unimat points & crossing tamper? Give purpose of each in brief. (5)
- (b) Describe working of track machines in track circuited and in electrified areas. (5)
- (c) What are the daily, weekly and other periodic inspection & maintenance schedules of a CSM 09-32 TT machines? How these are done and who is responsible for the same? (5)
- (d) What are the main differences between ballast cleaning machine, shoulder ballast cleaning machine and points & crossings ballast cleaning machine? (5)
- (e) Describe the working of T-28 (points & crossings renewals) machines with example of a renewal of one point in single line electrified sections. (5)

Question 5

- (a) List out various river training and protection measures adopted on a bridge site. (10)
- (b) What is the purpose of guide bund system adopted for a bridge? Explain its design and construction features with the help of a neat sketch. (15)



Question 6

Write short notes on any five of the following:-

- (i) Leaky roof treatment
- (ii) PH value of water
- (iii) Bacteriological impurities in the water
- (iv) Vulncrable locations
- (v) Monsoon precautions
- (vi) Completion report

5 x 5 = 25



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QUESTION PAPER NO. 1

**FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION
FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF
AEN (GROUP 'B') AGAINST 30% QUOTA
IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.**

DATE OF EXAMINATION

11-11-2006

Maximum Marks : 150

Time allowed : 03 Hours

NOTES:

- (1) **Attempt any five Questions.**
- (2) **Question No.1 is compulsory.**
- (3) **All questions to be answered in the Answer Sheet only.**

- प्रश्न - 1.(a) हिन्दी की निर्धारित परीक्षा पास करने पर किसी कर्मचारी को क्या-क्या प्रोत्साहन मिलते हैं । 6
- ✓(b) राजभाषा कार्यान्वयन समितियों का गठन किस-किस स्तर पर किया गया है । इन समितियों की बैठक कितने समय बाद होती है । 6
- ✓(c) हिन्दी शिक्षण योजना के अंतर्गत कर्मचारियों के लिए कौन-कौन सी निर्धारित परीक्षा है और उनका शैक्षिक स्तर क्या है । 6
- ✓(d) राजभाषा नियमों के अंतर्गत क, ख तथा ग क्षेत्र से क्या अभिप्राय है । 6
- (e) राजभाषा तथा राष्ट्रभाषा में क्या अंतर है । 6

- Question 2 Attempt any five of the following:- (30)
- (a) What are the various Indicator Boards for temporary restrictions required?
 - (b) What is the procedure for blocking the track for carrying out normal & emergency repairs to track?
 - (c) What action is a SSE (P.Way) (PWI Incharge) required to take in case of a derailment on the section where sabotage or miscreant activity is the prima facie cause of accident?
 - (d) What are the records that a SSE(P.Way) (PWI Incharge) required to carry with him during the rear window inspection of his section by the Principal Chief Engineer?
 - (e) Briefly describe the string line method of curve realignment.
 - (f) What are General & Subsidiary Rules of a railway and what are the issues concerning Engg.Deptt. mentioned in the same?
 - (g) How is the good running on level crossing, points & crossings to be ensured?
 - (h) What is the difference between push trolley, motor trolley and material lorry? How is the material lorry loaded with rails to be worked out and how is push trolley to be worked in section with limited visibility?
- Question 3 Describe in details the duties of ADEN (Open Line) in particular reference for maintenance & upkeep of:- (30)
- (a) Railway track
 - (b) Bridges
 - (c) Colonies
 - (d) Expenditure Control
 - (e) Large scale renewals of track.
- Question 4 An open web turnout steel bridge of 250 ft. (76m) span is to be launched from abutment to abutment. There is no intermediate support possible. Describe with sketches the method of launching the same & the main item of checks and cautions to be observed. (30)

OR

Describe in detail the procedure of detailed technical inspection of 7 x 250ft.(76m) open web girder bridge. This open web girder is rivetted and the bearings are cast steel roller & rocker types. (30)

- Question 5
- (a) What are the main hydraulic, mechanical and electrical systems in a Unimat points & crossing tamper? Give purpose of each in brief. (6)
 - (b) Describe working of track machines in track circuited and in electrified areas. (6)
 - (c) What are the daily, weekly and other periodic inspection & maintenance schedules of a CSM 09-32 TT machines. How these are done and who is responsible for the same? (6)
 - (d) What are the main differences between ballast cleaning machine, shoulder ballast cleaning machine and points & crossings ballast cleaning machine? (6)
 - (e) Describe the working of T-28 (points & crossings renewals) machines with example of a renewal of one point in single line electrified sections. (6)

Question 6

Indicate the following Schedule of Dimension (SOD). Draw sketch wherever necessary.

- (a) Minimum height of a heavy overhead structure (say ROB) above rail level in electrified territory. (5)
- (b) What are minimum and maximum clearances between check rails and running rails on a BG level crossing? (4)
- (c) Height above rail level for a BG high level and medium level passenger platform. (4)
- (d) Horizontal distance between the centre of a track and edge of coping of high level platform on BG. (5)
- (e) What is the slope at the end of a high level passenger platform given to taper of the platform? (4)

- (f) What is the minimum distance between centre of BG track and the nearest pier or abutment of a ROB in a running track? (4)
- (g) Maximum gradient of track in a BG passenger yard for normal speeding of train? (4)

Question 7.

Describe with the help of sketches the prescribed method of carrying out distressing of track for:-

- (a) Converting single rail to LWR (15)
- (b) For distressing of track required to be done due to unusual occurrences of rail fractures or track spacing to be out of alignment in hot weather. (15)

Question 8

- (a) Describe the following:- (20)
 - (i) Abstract estimate
 - (ii) Detailed estimate
 - (iii) Revised estimate
 - (iv) Material modification
 - (v) Completion Estimate
- (b) Describe the various elements of Completion Certificate and what are the essential elements to be checked before the same is sanctioned/approved. (10)

Question 9

- (a) What is the difference between Engineering & Traffic Level Xings? (6)
- (b) How are the categories C, B, A & A 'Spl.' given to a level crossing. What is the criteria? (6)
- (c) What are the various parameters according to which manning of unmanned Level Xing is prioritized? (6)
- (d) What are the criteria according to which a Level Xing can be considered for replacement by ROB/RUB? (6)
- (f) If the road authority at any given location approaches Railways for increasing the width of an existing 7.5m wide Level Crossing to 2 x 7.5 m wide manned Level Crossing, then what is the procedure to be followed? (6)

QUESTION PAPER NO. 11

**FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION
FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF
AEN (GROUP 'B') AGAINST 30% QUOTA
IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.**

DATE OF EXAMINATION

11-11-2006

Maximum Marks : 150

Time allowed : 03 Hours

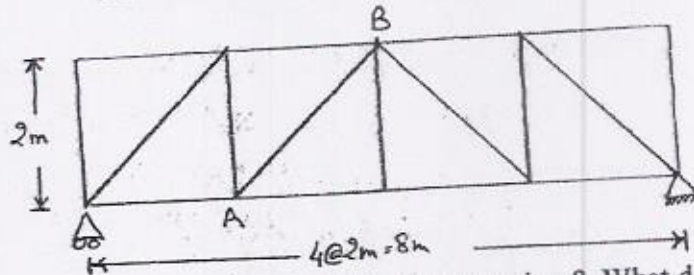
NOTES:

- (1) **Attempt any five Questions.**
- (2) **All Questions carry equal mark.**
- (3) **All questions to be answered in the Answer Sheet only.**

- Question 1
- (a) What are A, B, C, D, E, D Spl. & E Spl. categories of track? (4)
 - (b) What are criteria for sanctioning a track renewal in an existing running line? (4)
 - (c) Describe TSR, TRR, CTR, TWR, TBTR, TFR in brief and also describe which of these can be done with second hand serviceable material? (4)
 - (d) What are mechanical methods of carrying out TSR, CTR, Pts. & Xings renewals? What are the machines in use on IR at present? (4)
 - (e) Describe with sketch the layout & working of PQRS Depot. (5)
 - (f) Describe the disposal of released material in a CTR(P) of track with CST-9 sleepers with 52Kg. 72 UTS rails. (4)
 - (g) Describe with sketch the various speed restrictions imposed to carry out CTR(P) work with PQRS in a double line section which is being attended with machine tampers. (5)

Question No.2

For a pin jointed steel truss for a Foot over Bridge as shown below.
Draw the influence line for member A - B.



30

Question No.3

(a) What is plane table surveying? What do you understand by radiation method, intersection and traversing methods of plan tabling?

10

(b) What is fly leveling? How are reduced levels worked out in fly leveling and what are the arithmetic checks for ensuring correctness of the same.

10

(c) Describe the procedure for setting out of work for a block of two Type-I quarters, also mentioning the checks to be exercised.

10

Question No. 4

(a) Design a simply supported rectangular reinforced concrete beam of span 6 m. The beam has to carry a load of 8000 N/M including self weight. Show by sketch the reinforcement required.

20

(b) What is slenderness ratio in a column and describe what is effective length of a column.

10

Question No.5

(a) Describe controlled concrete and also the procedure of designing concrete mix for a particular strength say M.40

10

(b) How is prestressed concrete different from plain reinforced concrete. Give in brief merits & demerits of both and the main usages of prestressed concrete.

10

(c) How is water cement ratio important in any type of concreting? How can we achieve high workability of

concrete with low water cement ratio and under what circumstances is this needed. 10

Question No. 6

- (a) For water supply arrangements what is chlorination of water and super chlorination of water. 8
- (b) Describe with sketches the difference between a tube well and a Ranney well (infiltration galleries) 8
- (c) Describe with sketch the most commonly adopted type of bio-latrines & also a bio-gas plant (unit). 7
- (d) Show with sketches the differences between P trap & S trap in a European type water closet (WC). 7

Question No. 7

- (a) Describe with sketch the method of conducting plate load test to determine the bearing capacity of the soil at a certain depth. 10
- (b) Briefly describe the SPT (Standard Penetration Test) and what characteristics of the soil it can determine. 10
- (d) What are the main features of the blanket material required for a railway embankment and what are the most essential aspects to be complied with before it is allowed to be used as per present guidelines. 10

Question No. 8

Describe in brief the following. Use sketches wherever necessary.

- (a) Difference between roller & rocker and rocker bearing in a simply supported open web steel girder. 6
- (b) Camber given in a open web steel girder. 6
- (c) Submerged arc welding for the manufacture of a welded girder. Bring out the main advantages of the same and the necessary precaution to be taken. 6

(d) Procedure for metalising (sheradising) a welded plate girder and the advantages of metalising over normal painting. 6

(e) What is a Dye Penetration test & how is it useful in the inspection/testing of welded steel structure. 6

Question No. 9

(a) Describe procedure of land acquisition for constructing a colony for 1000 units of houses. The land required is about 40 hectares of agricultural land. 9

(b) What are main features of a Item rate tender documents and what is the procedure of such tender processing. 10

(c) What are the most important items to be taken care while preparing tender documents for the design & construction of Road Over Bridge (ROB) fully on viaduct. 10