

Subjective Type Questions

1. What is universal mode of simultaneous reception and dispatch facility of a yard? Show it on a double line territory through free hand diagram.
2. Explain in detail drawing the point operation circuit from normal to reverse and vice versa.
3. Explain various conditions of a point machine out of correspondence and suggest remedial measures.
4. Explain the system software of micro controller logic block card (MLB) and list out 10 functions of MLB of SSDAC.
5. Write down minimum 10 error code with description displayed in MLB card of SSDAC.
6. What are the pre-installation check lists of a SSDAC prescribed by RDSO? Explain them in detail to have better quality installation of Axle Counter.
7. Describe at least five vital safety maintenance work indicating the schedule of maintenance of ESM, JE/SE(Sig) and SSE(Sig) for each of the following block instruments:-
 - (a) Neale's ball token block instrument.
 - (b) Double line block instrument.
 - (c) TLBI (Daido).
 - (d) Tokenless push button type.
8. Draw a typical four road PI station on a double line territory based on which prepare:- Cable core distribution plan for the above yard keeping 10% core of each cable as spare core.
9. Calculate the number of micro locks including card files required for the above yard indicating number of vital, non-vital inputs as well as outputs.
10. Prepare the pre-commissioning requirements of IPS detailing ambiance of IPS room, batteries, power supply, earthing and lightning and surge protection.

11. Describe basic hardware and software elements of the micro lock-II of M/s US & S supplied and installed at EI stations over East Coast Railway and briefly explain their functions.
12. Write down the maintenance requirements of micro lock-II and the schedule of maintenance.
13. Write down at least five DO's and DON'Ts of the pre-commissioning check list for LED signals.
14. Differentiate between the following:-
 - (a) 'Low maintenance' and 'Valve regulated Lead Acid (Maintenance free)' batteries.
 - (b) 'Calling On signal' and 'Repeater signal'.
 - (c) 'Permissive signal' and 'Gate signal'.
 - (d) Analog and Digital Axle counter.
15. What do you understand by Ballast resistance? What is its role in track circuit adjustment? Write down its expression (formula) as given in SEM. What adjustment/maintenance you will make for a DC Track circuit prior to monsoon?
16. Explain the working of class 'B' & 'C' surge protection devices for electronic signaling equipment.
17. What are the advantages of triple pose lamp? How it has helped in reducing cases of 'blank signal'? What is its specification number?
18. What are the main advantages of SMPS based IPS over SCR based IPS?
19. Differentiate between the following:-
 - (a) Amplitude and Frequency modulation.
 - (b) Analog and Digital Multiplexing.
 - (c) Station Working Rules and Temporary working instructions.
 - (d) 'Preparatory reset' and 'Hard reset' in Digital Axle counter.
20. What are various S&T equipment to be kept and maintained in ART? What is the frequency of testing at officer level ?

21. Briefly explain Splicing process in OFC. What equipments are required for splicing and what instruments are required to conduct measurements after splicing is completed?
22. What are the tests and checks required to be carried out before commissioning a PI station by an officer?
23. How trains are run in a double line section having total communication failure ?
24. How many regions India is divided into as per Official Language Act? Briefly write the criteria and one state of each Region.
25. Briefly describe 'Revised budget' and 'Final Modification Estimate'.
26. What do you understand by the term 'Works Programme'?
27. Differentiate between of the following:
 - a. Permissive signal and Intermediate block signal.
 - b. Signal overlap and Block overlap.
 - c. IPS and Conventional Power supply arrangement at a PI station.
 - d. Standard-I and Standard-II interlocking.
28. What are precautions to be taken during commissioning of a Digital Axle counter?
29. Explain the working of Class 'B' and 'C' surge protection devices as used in IPS.
30. What are the advantages of LED signal lamp over conventional signal lamp? What is the role of HMU and Current regulator in LED lamp?
31. What do you understand by 'Pick Up' and 'Drop Away' voltage in a Track Relay? Name three different type of track relays used in a DC track circuit. How AC Immune Track Relay is different from a Non-AC Immune Track Relay.
32. Differentiate between of the following:
 - a. UHF and VHF communication
 - b. Pulse Amplitude modulation (PAM) and Pulse Code Modulation (PCM)
 - c. E&M signaling and DTMF signaling
 - d. Low maintenance (LM) batteries and maintenance Free Valve Regulated Lead Acid (VRLA) Batteries.

33. What is an INMARSAT Phone? Briefly explain its working. How this phone is used during an accident? How can the control office be contacted on this phone?
34. Briefly explain the splicing process in OFC. What equipments are required for splicing and what instruments are needed to conduct measurements after splicing is completed?
35. What is 'Directed Maintenance' and how is it done?
36. What are the pre-monsoon precautions required to be taken for a control section provided with Quad cable? Describe regular tests done on Quad cable including maintenance of Emergency sockets.
37. What are the details to be given while giving a tender notice?
38. What is the Official Language Act? How many regions India is divided as per this act? Name one state in each region. In which region East Coast Railway falls?
39. What do you understand by the term 'Liability Register'? Explain.
40. An OFC system is to be provided in Koraput – Kottavalasa section of East Coast Railway. The system will work on 1300 nm Single mode fibre and shall have STM-1 Short Haul and STM-1 long haul streams. Names of stations and their Chainages are given in drawing no. A.
 - a. Give the complete System Design including loss calculations for short haul and long haul OFC system for Koraput – Kottavalasa section and determine the locations for repeaters for long haul stream. Assume realistic technical parameters for the cable and the OFC equipment wherever necessary.
 - b. Find out System Margin for each long haul hop.
 - c. Give MUX configuration for Control circuits and administrative Trunk circuits.
 - d. Make an assessment of the quantity of materials and prepare an abstract estimate for the work covering 10 important items.
41. Diagram B gives the layout of a junction station.
 - a. Provide MACLS end cabin-signalling arrangement at the station to suit Interlocking Standard III(R).

- b. Determine the size of Catch Handle type Lever frames for the two end cabins.
- c. Make the Locking Table for the Home signals, Starter signals from Common loop lines, Slots for common loop lines and facing points & lock bars falling on the main lines for the south Cabin.
- d. Make an assessment of the quantity of materials for signaling works at South cabin and prepare an abstract estimate covering 10 important items.

42. LINE DIAGRAM FROM KTV TO DRPU

LINE DIAGRAM	Name of the Station	Chainage in KM
KTV		0
MVW		9
SUP		26
BDVR		33
SLPM		45
TXD		52
CMDP		64
BGHU		73
KVLS		84
SMLG		93
ARK		105
GPJ		115
DPC		127
PFU		137
BHJA		147
MKRD		159
PBV		171
SXV		179
KRPU		190

- 43. What are various penalties covered under Minor and Major Penalties?
- 44. What is meant by Risk Purchase? Why it is done?
- 45. What are the CCITT criteria for performance of a digital radio link? List out measurements to be made on a digital microwave link and mention test equipments in each case.

46. What are the clearance criteria for setting up of a new 7 GHz digital microwave link?
47. Explain the present switching network of East Coast Railway along with the numbering scheme. Suggest ways to improve the network.
48. An Electronic exchange is required to be set up at the new Administrative HQ building of east Coast Railway. Suggest a configuration for the system and prepare a tender schedule for calling the tender for the work.
49. The data network of East Coast Railway comprises of RAILNET, FOIS and RPS networks. Explain the complete data network layout. Suggest ways to improve the network.
50. Presently independent systems are being provided for various Passenger amenity systems at different stations. Suggest a scheme for their Integration and centralized operation & control from divisional control office.
51. What the adverse effects of environmental factors like corrosion, dust and temperature of the signaling and telecommunication systems. How these effects can be overcome?
52. Explain Sectional Route Release Circuit at a Metal-to-Metal Relay RRI installation with the help of the circuit diagram.
53. With the help of circuit diagram, explain point operation circuit for a crossover without Super-imposed detection. Compare merit and de-merits of superimposed and Non-Superimposed detection methods.
54. At a 3-line Panel Interlocked station with universal simultaneous reception facility on an electrified single line section with second distant signal, assess the Main cable requirement between the Central Relay Room and one End Goomty. Also give the cable core allocation.
55. Prepare the interlocking plan in A4 size for a station having four roads in double line section with universal reception and dispatch facility in a MACLS territory with one LC gate between starter and home signal, with one siding taking off from one of the loop line and suitable for standards II ® interlocking.

Show all the signals, track circuits, numbering of functions, show the overlaps, CSL, FM, Gradients, Aspect controls chart, Crank Handle groups, Station Building, Platforms.

56. Describe five advantages and disadvantages between the following:
 - a. 'Low maintenance' and Valve regulated Lead acid (Maintenance free) batteries.
 - b. 'Calling On signal' and 'Repeater signal'.
 - c. 'Permissive signal' and 'Gate signal'.
 - d. Analog and digital axle counter.
57. What are various S&T equipment to be kept and maintained in ART? What is the frequency of testing at officer level?
58. Briefly explain Splicing process in OFC. What equipments are required for splicing and what instruments are required to conduct measurements after splicing is completed?
59. What are the tests and checks required to be carried out before commissioning a PI station by an officer?
60. How trains are run in a double line section having total communication failure?
61. How many regions India is divided into as per Official language Act? Briefly write the criteria and one state of each region.
62. Briefly describe 'Revised budget' and 'Final modification Estimate'.
63. What do you understand by the term 'Works Programme'?
64. Describe advantages of use of Rajbhasa as official language in central government offices.
65. What is universal mode of simultaneous reception and dispatch facility of a yard? Show it on a double line territory through free hand diagram.
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80. What do you understand by the term 'Liability Register' ? Explain
81. Write short notes on all.
- (a) UPS and IPS.
 - (b) Router and Switch.
 - (c) Jitter and GSM.
 - (d) GPS and GSM.
 - (e) CCITT and CENLEC.
82. Write short notes of the following.
- (a) Commutation of pension.
 - (b) Rate Contract.
 - (c) PNM and PREM.
 - (d) Emergency Certificate.
 - (e) Stock and Non-stock items.
83. Write short notes of the following.
- (a) BAW
 - (b) DS-8
 - (c) Performance Guarantee.
 - (d) EMD
 - (e) SF-5
84. Explain in short for the following.
- (a) Maternity Leave.
 - (b) Pecuniary loss.
 - (c) HOER.
 - (d) M&P Program.
 - (e) Minor Penalties.
85. Write short notes in brief.
- (a) Variation and Vitiation.
 - (b) August Review.
 - (c) Plan Head-33
 - (d) Delegation of Powers.
 - (e) Financial and Cost Control in Railways.
86. Answer the following:

- a. What are the incentives given to the Railway employees to encourage use of Rajbhasa?
 - b. What are various courses being run by the Government to impart Rajbhasa training to government Employees?
 - c. Write Hindi translation of the following
FIR, Efficiency, Investigation, Sanction, Finance concurrence, Selection, Promotion, Penalty, Security, Allowance.
87. Write short notes
- a. Dependent relatives under Pass rules
 - b. Mechanism for settlement of Industrial disputes on IR
 - c. Roster Point system
88. Write Short notes
- a. Arbitration
 - b. Qualification criterion in s work contract
 - c. Recording MB for an on-account bill
89. What are the major changes in the personal income tax rules in the recent budget?
90. Write notes
- a. Modifications at a MLQ end cabin station to suit RE
 - b. Fouling protection
 - c. Running of trains on a single line section during Total Interruption of communication
91. Write short notes of the following:-
- (a) Cross protection in signaling circuits.
 - (b) Intermediate block signal.
 - (c) 'Signal overlap' and 'Block overlap'.
 - (d) Conditions for granting line clear at 'B' class station in single line section.
 - (e) 'Catch siding' and 'Slip siding'.
 - (f) IPS
92. Write short notes on of the following:-
- (a) DTMF signaling in control working.
 - (b) SDH system in OFC Communication.
 - (c) Frequency diversity and Space diversity.
 - (d) Drop Insert MUX and Terminal MUX.
 - (e) Network Management System (NMS) for OFC system.
 - (f) Initial charging of Lead Acid Secondary cells and their maintenance.

93. Write short notes of the following:-
- Stock sheets and Narrative reports.
 - Open tender and Limited tender.
 - Briefing Note.
 - Annual Maintenance Contract (AMC).
 - Procurement of PAC item.
 - Daily Transaction Resister.
94. Write short notes of the following:-
- Hours of Employment Regulation (HOER).
 - Pass & PTO rules applicable to Group 'C' & 'D' staff.
 - Major penalty and Minor penalty under D & AR.
95. Write short notes of the following:-
- PNM
 - Imprest store
 - Commutation of Pension
96. Write short notes of the following:
- Data-logger
 - Approach Locking
 - Cascading of signals
 - Conditions for granting line clear at 'B' class station in double line section.
 - Electronic interlocking system
 - Train actuated Level crossing Warning Device.
97. Write short notes of the following:
- Psophometric noise
 - Railnet
 - IVRS System
 - Radio Trunking System
 - Frequency Diversity and Space Diversity
 - SDH system in OFC Communication System
98. Write short notes of the following:
- Workman's Compensation Act
 - Single Tender and Limited Tender
 - 'Measurement book' and 'On-account bill'.
 - Draft Para
 - Stock Item and Non-stock Item
 - Revenue budget and Works budget

99. Write short notes of the following:
- Revised Budget and Final modification Estimate
 - Works Programme and M&P Programme.
 - Major Penalty under D&AR for Railway servants.
100. Write short notes of the following:
- Primary units of Account
 - PREM
 - Condemnation of unserviceable store items
101. Write short notes
- Solid lubricated ducts
 - SACFA and WPC clearances
 - Essentials of Interlocking
 - Use Electronics in signaling safety applications
102. Write short notes of the following:
- RDSO type signal reverser
 - Double wire compensator
 - Prepare the dog chart for the following:
 - 2 is released by 3 or 4.
 - 18 locks 21 when 33 reverse
 - 25 locks 19, 19 locks 23 when 24 normal
 - 8 releases 9, 10 when 13 normal, 15 reverse
103. Write short notes of the following :
- DTMF signaling in control working.
 - SDH system in OFC Communication.
 - Frequency diversity and route diversity.
 - Drop Insert Mum and Terminal MUX.
 - Network Management System (NMS) of FOIS.
 - Initial charging of Lead Acid Secondary cells and their maintenance.
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106. Write short notes of the following :
- a. PNM
 - b. Imprest store
 - c. Communication of Pension