

Q-1:-

What is the procedure for absorption of disabled/medically de-categorised staff in Alternative Employment

वर्कलांग / वॉकडासकएय decategorised कमछाएय के अवशोषण के लिए वैकल्पिक रोजगार या लिखो ।

Q-2:-

What is Audit Para, Draft Para and Audit Inspection report?

आडिट पैरा , ड्राफ्ट पैरा और आडिट इनस्पेक्शन रिपोर्ट या है?

Q-3:-

Explain in brief.

i) M&P Programme

ii) Material Modification

संक्षेप में समझाइए :-

i) एम एंड पी प्रोग्राम

ii) सामग्री संशोधन

Q-4:-

What are the responsibilities of Principal Employer as per Contract Labour(Regulations and Abolition) Act-1970 and Minimum Wages act-1948?

ठेका म (वॉनजयम और उन्मूलन) अधिनियम 1970 और न्यूनतम मजदूरी अधिनियम 1948 - कानून के रूप में मुख्य ज़िम्मेदारी के उत्तरदायी बताया है

Q-5:-

What is the procedure for banning of business dealings with a firm?

एक फर्म के साथ व्यापार व्यवहार पर प्रतिबंध लगाने के लिए क्या किया है ।

Q-6:-

(i) What are Railway Board's guidelines for rotation of Officials working in Sensitive posts?

संवेदनशील पदों में काम कर रहे अधिकारियों के रोटेशन के लिए रेलवे बोर्ड के दिशा निर्देश बताएँ ?

(ii) Write down the list of Sensitive posts in Non-gazetted cadre in Electrical department.

व्युत्त विभाग में अराजपुत कैडर में संवेदनशील पदों की सूची लिखें।

Q-7:-

What are the yardstick for requirement of Non gazetted staff for various establishments in Electrical department?

व्युत्त विभाग में विभिन्न संस्थानों के लिए अराजपुत कमछाएय का आवश्यकता के लिए मानदंड बताएँ

Q-8:-

- (i) Explain step by step, how you will calculate the Specific Energy Consumption(SEC) for Goods service and Coaching service?
कैसे आप माल सेवाओं और कोचिंग सेवा के लिए एवरेज ऊर्जा खपत(SEC) का गणना कर सकते हैं ?

- (ii) Following is the Loco holding of an Electric Loco shed-
WAG5=100, WAG7=20, WAG9=30, WAP4=20.
Bare requirement of Locos for Coaching Link=22.
Calculate the Loco outage Target for Goods and Coaching services.

एक इलेक्ट्रिक लोको शेड का निम्नलिखित लोको holding है-
WAG5=100, WAG7=20, WAG9=30, WAP4=20
कोचिंग लिंक के लिए लोको के माँ आवश्यकता (Bare requirement) = 22.
माल और कोचिंग सेवाओं के लिए लोको आउटेज लॉय का हिसाब लगाए ।

Q-9:-

What are the trouble shooting steps in a WAG9 Loco with the following fault-
WAG9 Loco का निम्नलिखित fault के लिये trouble शूटिंग का ़या लिखें।

S.S. No.	Fault No.	Fault Message
SS01	F0101P2	Loco XXXXX SS01 : Main Power OVER TEMPERATURE CONTROL ELECTRONICS Turn off the loco. Setup cooling mode F0101P2

Q-10:-

What are the trouble shooting steps in RMPU type AC coach for Compressor-1 not working?

RMPU ़कार एसी कोच में "कंप्रेसर-1 काम नहीं कर रहा" के लिए trouble शूटिंग कदम ़या हँ

Q-11:-

What are different types of Pumps. Write down the characteristics of Centrifugal Pumps.
पंपों के विभिन्न ़कार ़या हँ। केन्द्रापसारक पंप का विशेषताओं लिखें।

Q-12:-

- (i) What are the checks done during Annual Maintenance of OHE?
OHE के वार्षिक रखरखाव के दौरान ़या ़या चेक क़िया जाता हँ
- (ii) What are the rules for operation of OHE Inspection Car?
OHE निरीक्षण कार के संचालन के लिए ़या नियम हँ

Q-13:-

- (i) What are the checks and tests before commissioning a General Services substation?
एक सामान्य सेवा सबस्टेशन चालू करने से पहले ़या जाँच और परीक्षण करना चाहिए?

- (ii) What are the recommended tests along with various test parameters for insulating oil in service for Transformers?

ऑसफॉमऑ के ऑलए सेवा मॉइऑसुलेट तेल के ऑलए परऑण ऑसफऑरश तथा ऑवऑऑन परऑण मानकऑ का वणऑऑ करऑ

Q-14:-

- (i) Describe the protection scheme used for Traction Power Transformer.

ऑैऑशन पावर ऑऑसफॉमऑ के ऑलए ऑऑतेमाल सुरऑा योजना का वणऑऑ करऑ

- (ii) What are the general guidelines for Anti-theft charging of OHE?

ऑHE के ऑोरऑ ऑवरोधी ऑाऑऑकरने के ऑलए सामाऑय ऑदशा ऑदऑऑा ऑया हऑ

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1. Draw a schematic layout of equipment for a typical 11KV/0.415KV outdoor substation having one transformer of 250KVA capacity
2. Describe briefly the various routine and Type Tests required to be carried out on a distribution transformer as per Indian Standard Specifications.
3. What is a Secondary cell? Explain the construction of a Lead Acid Cell.
4. What is Rolling in Examination? What aspects should be specially observed by the electrical staff during Rolling in Examination?
5. What is the procedure and the hydraulic data required for designing a Pumping Installation?
6. Explain in brief the different types of Train Lighting System in operation on Broad Gauge Trains on Indian Railways.
7. Define Lux , What is meant by the Polar Diagram of a light fitting and how would a typical luminaire modify the polar curve of a bare incandescent lamp.
8. Draw Torque Speed characteristics of a DC series motor and a DC shunt motor? Which type of motor is used for traction and why?
9. What are the heat loads with reference to Air-Conditioning? What is a package type AC system and how does it compare with window type ACs of same tonnage?
10. Explain in detail the Electrical Circuit of a newly built Self generating AC coach giving technical parameters of major equipment. Also draw a neat Block diagram of the Electrical Circuit.
11. What are the causes of Electrical Fire? What aspects need to be examined in a Coach involved in Fire?
12. Explain the new developments in batteries used on AC and non-AC coaches.
13. Write briefly on Earthing of Electrical Assets. What is the importance of Neutral grounding of a distribution transformer?
14. What are the main provisions of 1987 Track Crossing Regulation of Indian Railways? As per 1987 Track Crossing Regulation, what minimum vertical clearance is required for 220KV Overhead line crossing a BG track.
15. Write note on Dyna Drive .
16. Define Load factor of a power station
17. Define Plant factor
18. Define Utilization factor of a power station
19. A power station has to meet the following demand:
 Group A: 100 kW power load between 8 am to 6 pm
 Group B: 150 kW lighting load between 6 am to 10 am
 Group C: 50 kW pumping load between 6 am to 10 am
 Group D: 20 kW other load between 10 am to 6 am
 Determine: (a) Diversity factor (b) Toe load factor (c) The no. of units generated per day for the station
20. Enumerate various types of faults which occur in a 3 ϕ power supply system
21. What are the advantages of an improved power factor? Calculate the rating of a capacitor required to improve the p.f. of a 5 kW load from 0.6 to 0.9.
22. Compare the advantages of a centrifugal pump with a reciprocating pump?

23. What is the objection to operating a centrifugal pump with deliver valve closed? What is the effect of controlling the delivery by a sluice valve on the suction side?
24. What are various improvement measures taken by ECoR in TL/AC coaches for passenger amenity and safety? Enumerate.
25. What is the difference between preventive maintenance, trouble shooting and repair?
26. What is provided in Rule-4 of Indian Electricity Rules, 1956? Describe the details of electric shock treatment.
27. What is trickle charge of lead acid batteries?
28. Define and describe the causes and methods of restoration of sulphated battery.
29. Describe the probable causes of electric fire in a TL coach. What aspects need to be examined in a TL coach involved in a fire?
30. Draw the equivalent circuit diagram of a transformer and the phaser diagram of transformer with resistance and leakage reactance. Describe the conditions for parallel operation of two transformers.
31. Describe briefly the speed control obtained in locomotive having :
 - (a) D.C. traction motors
 - (b) Three phase traction motors
 - (c) Advantage of 3 phase motors over single phase motors
32. Describe briefly the EP Brake system used on EME/MEMU indicating functions of various valves.
33. What are the main differences (Operation & Maintenance) between RMPU & underslung AC Coaches? Which is more economical in operation and why?
34. What are the salient features of roof mounted air conditioned coaches? Indicate modifications necessary in the existing maintenance sheds for roof mounted AC coaches?
35. Enumerate the type of defects on OHE which can lead to pantograph entanglement. What are the checks to be done during Tower Wagon inspections to improve reliability of OHE?
36. Draw a neat sketch of cantilever assembly indicating the various part and normal clearances?
37. For a workshop with connected load of 750 KVA, a substation of adequate capacity has to be planned. Prepare a single line diagram showing the lay out of substation with metering arrangement on H.T. side and 6 L.T. feeders going to different shops. Please indicate protection system provided.
38. What do you understand by earth leakage breaker? Where the use of earth leakage breakers obligatory? Explain its working.
39. Work-out H.P. of the motor for a pump required to deliver 2500 Liters Per hour against a total head of 50 meters.
40. In what way is a submersible pump superior to a vertical spindle pump? What are its limitations?
41. A 3-tier sleeper coach has caught fire in a mail train hauled by a Diesel locomotive. The coach is half burnt. Indicate steps you will take for investigating the cause of failure clearly write down assumptions made including extent of damages. Advise your recommendations for eliminating electrical fire on coaches.
42. List out 4 most important duties of the Electrical Inspector under the Indian Electricity Act.

43. Describe 3 important tests you will carry out before commissioning an 11 KV/415 V sub station of 1000 KW capacity comprising two transformer 500 KVA each.
44. What are the desirable properties of a refrigerant?
45. Compare a room air conditioner and a split unit. Explain the installation method to be adopted to get optimum performance from a room air conditioner.
46. What is the effect of mains voltage variation on fluorescent lamp performance?
47. If a fluorescent lamp does not work, how would you proceed rectifying it in case a lamp flickering on and off but does not start?
48. Explain in brief all the different parts of a ceiling fan along with its typical data and list out the acceptance tests for the same.
49. (a) Write down the brief specification and important parameter for a 500kVA power transformer.
(b) What are the points to be checked while inspecting the earthing arrangements?
(c) Define any five of the following in brief
(i) Miniature circuit breaker (ii) Cable PVC sheathed (iii) Sub circuit
(iv) Illumination (v) Colour rendering (vi) Maintenance factor of a luminaire
(vi) HRC fuse
50. Explain merits and demerits of conventional underslung and RMPU type air-conditioning system of coaches.
51. What are various protection components in power, control and air circuit of RMPU type AC system of coaches? What action would you take in case of HTR-1 or HTR-2 Red-light on?
52. (a) Explain with a neat sketch the suspension and tensioning arrangement provided for alternator in AC sleeper coaches.
(b) What are the checks to be exercised at the time of changing of δV belts in AC coach depots to ensure longer life for the belts?
(c) What are the common problems experienced in East Coast Railway in the alternators and suspension arrangement of AC coaches?
53. (a) How would you select type and capacity of a pump for water supply? Explain the difference between H.S.Pump and submersible pump. What are the common difficulties encountered with functioning of pumps and what are the remedial measures?
(b) What are the relaxations which can be granted by EIG in case of electrical crossings of Railway Track? Mention important checks in case of power line/cable crossing before permitting energisation.
54. (a) What do you understand by the statement "ENERGY PRODUCED"? How is energy saved by Driver/motorman while working locomotives and MEMUs?
(b) How you will counsel the driver/motorman for reduction in specific energy consumption?
55. (a) What are the uncommon items in 3-phase locomotives as compared to conventional electric locomotives? Mention the problems faced with 3-phase locomotives on E.Co.Railway. What are the measures to be taken to overcome these problems?
(b) Describe briefly advantages of 3-phase traction motors over single phase motors.
56. Draw a line diagram of power circuit of an AC locomotive or EMU/MEMU. Why DC series traction motors were preferred over other DC motors?
57. Draw the line diagram of a 132/25 KV Traction Substation indicating the protective relays.

58. What are the advantages of providing capacitor bank in TSS?
59. Draw the line diagram of refrigeration cycle and explain the function of each equipment
60. What is threshold of comfort? List the factors contributing to comfort in an AC coach.
61. List the various types of water pumps in use with brief description. Enumerate the advantages and disadvantages of these pumps, also, indicate the preventive methods of obviating failure of water supply arrangement.
62.
 - (a) What are the different types of bonds and jumpers provided in OHE?
 - (b) What is pre-sag? What is its value for a 72 m span tangent track (assume 100 kmph)?
 - (c) What are the different types of masts in use in 25kV AC electrification?
63.
 - (a) What are the different alternator ratings adopted in passenger coaches in IR?
 - (b) Draw the circuit diagram of a 110 V AC train lighting system with explanation.
 - (c) What are the common defects of V-belts in TL/AC system?
 - (d) What are the advantages of 110 V AC system over other conventional systems in TL/AC?
64.
 - (a) How the wheel slip is detected and arrested in Electric Locos?
 - (b) What is the setting of QLM & QRSI in WAG-7 locos? Explain their importance.
 - (c) What will happen to loco while it is hauling a heavy load on an up gradient and power supply (25 kV) fails for 0.5 seconds?
65.
 - (a) What are the maximum earth values of HT & LT installations?
 - (b) What is the simple method of testing the efficacy of earth in a 3 pin socket in your house?
 - (c) What is the minimum height of lowest conductor above rail level prescribed as per latest power line crossing
66. Explain the following:
 - (a) SEC and the measures to control the same
 - (b) Measures to control Power Factor in Substations.
 - (c) Different types of energy meters
 - (d) Maintenance schedules of 8-wheeler tower car
 - (e) Importance and use of TDRs in Electric Locos.
 - (f) Arno converter Vs. SI unit.
 - (g) Importance of Trip Inspection for Electric Locos.
67. Discuss the various types of batteries used in TL & AC coaches. Also, discuss the settings of alternator for various types of coaches. What is the importance of regulator?
68. Explain the following:
 - (a) Energy efficient devices
 - (b) Testing of transformer oils
 - (c) Condition monitoring of traction transformers
 - (d) Procedure for taking power block.
 - (e) Traction Remote Control System.
 - (f) Safety equipment in Electric Locos.
 - (g) Inductive and capacitance loads
 - (h) Energy conservation
69. Describe the various types of Training given to Traction Assistants and Drivers. What

are contents of Refresher Courses in GR & SR and the importance thereof?

70. Give 10 important causes for recent either Electric Loco or EME/MEMU failures? Also, describe the maintenance procedures, which can reduce these failures?
71. Give 10 important causes of recent AC coach failures? Also, describe the maintenance procedures, which can reduce these failures?
72. Give 10 important causes of recent TRD failures? Also describe the maintenance procedures, which can reduce these failures
73. Describe the various causes of trippings without apparent cause in the 25 kV AC system? What are the harmful effects of these trippings? What are the measures that can reduce the trippings?
74. What are various types of batteries used in TL and AC coaches? What is the schedule of maintenance for these batteries? Also, describe the procedure for revival of dead/weak cells?
75. Give the layout of Electric Loco Shed or EMU Car Shed? Explain the activities of various sections and the role of PPIO.
76. Give the layout of 132 kV/25kV Traction Substation. Give the important protection devices for the 25 kV AC system?
77. (a) Give the advantages of 110 V TL system adopted by Indian Railways/
(b) Explain the difference between RMPU and conventional AC coaches? Explain the advantages of RMPU coaches
78. (a) Describe in detail the training schedule of a recently recruited Traction Assistant.
(b) Describe the duties of Traction Assistant while on Foot Plate
(c) Recommendations of RSRC in respect of Running staff.
79. What are the steps required to be taken by a Loco Pilot to improve specific energy consumption.
80. Explain the following
 - (a) Measures to control Power Factor in substation
 - (b) Earthing in electrical installations
 - (c) Maintenance schedules of Power Car
 - (d) Different types of Regulators used in TL coaches
 - (e) Checks for Power line crossings before energization

Short Notes

- i Automatic Tensioning Device
- ii End on generation and head on generation (hotel load)
- iii Bench marking vs. yardstick of staff for TL/AC maintenance
- iv Earth testing of TL coaches
- v Various safety equipments/measures at a power supply sub-station
- vi Break down maintenance
- vii Main provisions in Track crossing Regulation of Indian Railways, 1987
- viii Capacity test of 1100AH battery set of coaches
- ix Penalties for theft of electricity and violations of any two provisions of the New Electricity Act and Rules
- x Montreal Protocol and status of its implementation in Indian Railways as regards use of

	refrigerants in AC coaches
xi	ISO-9000 certification for a power sub-station or an AC coaching depot
xii	Various types of Incentive Schemes in workshops of Indian Railways.
xiii	Battery capacity for AC locomotive
xiv	Time lag of Q44 and Q118 relays
xv	Height of 11kV line crossing a road
xvi	Stagger of contact wire straight track and curved track
xvii	KVA capacity of inverter in AC coaches
xviii	Lumens output of 40W tube and 70W HPSV lamp.
xix	Permissible earth resistance of HT & LT earth in 11kV/400 volt sub station
xx	Power factor improvement
xxi	Energy conservation
xxii	Capacity test of 120AH battery set of coaches
xxiii	Water raising apparatus
xxiv	Merits & demerits of self generation and end on generation system on coaches
xxv	Battery capacity in AC sleeper coaches (Self Generating) & 110 V non-AC coaches
xxvi	Utility of ejector pumps and its principle of working.
xxvii	Schaku couplers and difference with other couplers
xxviii	Permissible earth resistance of HT&LT earthing in 11 KV/415 V substation and 25 KV side in traction substation.
xxix	Protective relays in Traction substation
xxx	Commissioning Tests and their values for Traction substation
xxxi	Track bounding and foot patrolling of OHE
xxxii	Trouble shooting for ñTripping without apparent causeò
xxxiii	Importance of Q44 X Q118 relays in electric locos.
xxxiv	Importance of DBR in electric locos.
xxxv	Causes of wheel slip in Electric Locos
xxxvi	Wheel measurements like root/flange wear and its importance
xxxvii	Maintenance Schedules of Electric Locos
xxxviii	Fire prevention measures in Electric Locos
xxxix	Reasons for adopting metalized carbon strips in pantographs
xxxx	Use of energy efficient devices.
xxxxi	Preventive maintenance of DG sets
xxxixiii	Safety measures to prevent Electric shocks
xxxxiv	Importance of Earthing in electric installations.
xxxxv	Preventive maintenance of lifts
xxxxvi	DGA of transformer oils
xxxxvii	Advantages of split type AC system

xxxxviii Advantages of MCB/MCCB over fuses.

xxxxix Root wear and flange wear

xxxxx Trouble shooting for ñICDJò

FINANCE

1.	What is the difference between Finance Vetting and Finance Concurrence? Which main points are required to be checked by Finance while concurring a proposal?
2.	How is Revenue Expenditure Budget finalized on Indian Railways? Which are the different stages in which it can be reviewed?
3.	How is Works Programme finalized on Indian Railways? Which are the different Plan Heads in which the Works Programme is classified?
4.	What is the test of remunerative ness for a project as per financial code?
5.	What are the demands for grants? What do you understand by the term 'Vote on Account'?
6.	What is the demand no. and minor heads for the following:- (a) Operating Expenses ñ Fuel ñ Fuel Electric traction (b) Operating Expenses ñ Rolling stock and equipment Electric Locomotives (c) Repair and maintenance of plant and equipment ñ Electrical Train Lighting (d) Repair and maintenance of carriages and wagons ñ Electrical General Services
7.	What is Works, Machinery and rolling stock programme? What are various stages of their formations?
8.	What is difference between Rate and Running Contract and Proprietary Article Certificate and Single Tender?
9.	What are the important major heads/subheads of various demands of grants concerning the Electrical department? State some of the steps which you would take to control the expenditure under any one of the subheads
10.	Describe the various revenue demands under which expenditure is booked? Describe the term PU and its purpose.
11.	Describe the various types of Estimates prepared in the Railways? What are the various stages of getting a work of about Rupees 60 Lakhs (Sixty Lakhs) to be sanctioned? Give an abstract Estimate for Electrical Wiring of a new station building under Passenger Amenities head?
	<u>Short Notes</u>
i	Contingent charges
ii	Completion reports
iii	Canons of financial propriety
iv	Financial concurrence and vetting
v	Public Accounts Committee
vi	Distinguish between Works Programme, M&P Programme and Rolling Stock Programme
vii	What are the powers of GM of a railway for material modification? What is vitiation in a contract?
Viii	Define and distinguish between abstract estimate, detailed estimate and completion estimate

ix	What are draft Para and inspection reports?
X	Demand for grants and the plan head controlled by CEE of a railway with subheads
xi	Demand No.16 and its plan heads
xii	Distinguish between (i) Audit Notes & Inspection Reports (ii) Ordinary and special contingencies
xiii	Management information system
xiv	Annual Maintenance Contract (AMC) and Rate Running Contract (RRC)
xv	Workshop manufacturing suspense
xvi	Deposit works
xvii	DCF Technique
xviii	Various types of audit inspections
xiv	Works Programme, Pink Book, LAW book, Lump sum works
xv	Material modification
xvi	M&P Programme

ESTABLISHMENT

1.	Explain in detail the benefits available to a Railway Employee on Superannuation.
2.	What is the difference in dealing with recognized and unrecognized labour unions? Explain in detail the Permanent Negotiating Machinery and how it operates at the different management levels.
3.	Can a major penalty charge-sheet be converted to a minor penalty charge-sheet?
4.	Will it be permissible for a disciplinary authority to change the orders passed earlier in the following circumstances: (a) orders regarding suspension of an employee (b) orders regarding imposition of a penalty on a railway servant
5.	Can you draw daily allowance for your journey within the same municipal limits in which you are posted if the place of your temporary duty is (i) 5 Kms (ii) 10 Kms away to your HQ and what would be the rate of DA in case the HQ is a city having DA as double of the normal rate?
6.	Define the following (a) Lien (b) Cadre (c) Family (d) Average pay (e) Identical scale (vi) Tenure post (vii) Rule 3 (2)i of Railway Service Conduct Rule, 1966 (viii) Personal Pay (ix) Railway Servant
7.	What is the difference between a major penalty and minor penalty? Indicate the various stages of conducting the enquiry against a staff to whom major penalty charge sheet has been issued. Also indicate the time limit for each stage.
8.	What is defined as 'Right to leave' as per Leave Rules.
9.	Who is to maintain Leave Accounts in respect of the following: Group A and Group B Railway Servants Group C and Group D Railway Servants

10.	Define Leave on Average Pay and Leave on Half Average Pay
11.	Distinguish between the following groups:- (a) PNM & PREM (b) Fortuitous Service and continuous service (c) Identical time scale and same time scale (d) Supernumerary and work charged post (e) Strike and lay off (f) Payment of wages Act and minimum wages Act
12.	Enumerate the facilities for travel in Rajdhani and Shatabdi trains for Technician Gr-I, SE/SSE and a Gr. B officer and his bonafide attendant on duty.
13.	Describe the various major and minor penalties covered under D&AR. Discuss the circumstances under which the penalty of dismissal/removal may be imposed on a permanent employee? Also, discuss specifically the situation where an inquiry under D&AR may be dispensed with?
14.	Write explanatory Notes on the following: (a) Salient features of Factories Act. (b) Salient features of Payment of Wages act. (c) Rolling Stock and M&P Programme. (d) Material Modification. (e) The Role of Vigilance Organization
15.	(a) Describe various categories of staff under HOER. What are the various allowances admissible for running staff? (b) What are the various types of passes and indicate their admissibility?
16.	What are the various incentives for propagating the use of Hindi in Central Government Offices?
17.	What are the three main Hindi examinations conducted for the Railway staff for proficiency in Hindi (working knowledge).
18.	Enumerate the provisions of Official Language Act
19.	(a) What are the steps being taken in Railways to promote the use of Rajbhasha? (b) Translate any 15 of the following in Hindi Overhauling; Ownership; Overdue; Painter; Paid up Capital; Periodic return; Permanent; Receipt; Provident Fund; Coach; Code; Claim; Devaluation; Gradual; Member; Mechanical; Electrical; Neglect; Sanction; Concurrence; Survey; Safety; Approval; Calculation.
20.	(a) Which are the items covered in Section 3(3) of the Rajbhasha Implementation Act for which 100% implementation is a must? (b) Why is the Hindi Week celebrated? (c) For the purpose of Rajbhasha, country has been divided in 3 categories viz., A, B and C. Give two examples of each category?
	<u>Short Notes</u>
i.	Leave not due
ii	Hours of Employment Regulation (HOER)
iii	Factory Act
iv	Next below rule
v	Leave not due
vi	Dual charge allowance

vii	Rule 17&20 of the railway servant D&AR Rules, 1968
viii	Rule 18(2) of the Railway Service Conduct Rules, 1966
ix	Rule 18(3) of the Railway Service Conduct Rules, 1966
Xi	Supernumerary and work-charged post
xii	Qualifying service
xiii	Bicycle Allowance
xiv	Quarantine leave
xv	Name of all zones and their HQs and seven (7) expanded names of PSUs in Ministry of Railways.
xvi	PREM Groups and its role
xvii	Imprest item
xviii	Incentive Scheme
xix	The Role of PNM
xx	Liability Registers
xxi	Encashment of LAP
xxii	Workmen's Compensation Act
xxiii	Payment of Wages Act

STORES

	<u>Short Notes</u>
i.	A, B and C classification of Stores and its purpose
ii	Procedure for making an item as Stock item
iii	Difference between imprest item and Stock item
iv	Rate Contract purpose and advantage.
v	Various forms of tendering for procurement of Stores.
vi	Procedure for procuring an item under PAC.
vii	Responsibility of a supervisor towards procurement of quality stores
viii	Procedure for doing emergency purchase under AMM powers
ix	Difference between Stock and Non-stock items

- Q.1 Write ten important causes for recent either Electric Loco or AC Coaches or TRD failures. What steps were taken to reduce these failures?
- Q.2 Draw layout of 132/25 Kv Traction Substation. Explain all important protection devices for 25 Kv system.
- Q.3(A) What are various protection systems in power, control and air circuit of RMPU AC coaches.
- (B) Explain the difference between RMPU and Conventional AC coaches? Explain advantages of RMPU coaches.
- Q.4(A) Describe in detail the training schedule of a recently recruited Assistant Loco Pilot?
- (B) What are the steps required to be taken by a Loco Pilot to improve specific energy consumption.
- (C) Answer the following in ñyesò or ñnoò
- (i) DC series traction motors are fitted in WAG5 Electric Locos.
 - (ii) Regenerative braking is not available in WAG7 Locos
 - (iii) Star rating is given by BEE based on energy efficiency of appliances
 - (iv) A new plan head 37 has been introduced from 2012-13
 - (v) Tariff for railway electric traction is two part tariff in Odisha.
- Q.5 Write short notes on the following:-
- (A) Root wear and flange wear
 - (B) Maintenance schedules of Electric Locomotive
 - (C) Fire preventive measures on coaches
 - (D) Dissolved gas analysis on transformer oil
 - (E) Trouble shooting for ñICDJò
- Q.6 Explain the following:-
- (A) Measures to control Power Factor in substation
 - (B) Earthing in electrical installations
 - (C) Maintenance schedules of Power Car
 - (D) Different types of Regulators used in TL coaches
 - (E) Checks for Power line crossings before energisation
-
- Q.1 Write short notes on the following:-
- (A) PNM & PREM
 - (B) Rule 18 (3) of the Railway Service Conduct Rules 1966
 - (C) Rule 17 and 20 of the Railway Servant D&AR 1968
 - (D) Encashment of LAP
 - (E) Salient features of Payment of Wages Act
- Q.2 Explain the following:-
- (A) Cannons of financial propriety
 - (B) Material modification
 - (C) Various type of audit inspections
 - (D) Difference between Stock and Non-stock items
 - (E) M&P Programme
- Q.3
- (A) Describe various revenue demands
 - (B) Explain in the term ñVote on Accountò
 - (C) What are the documents coming under section 3(3) of official language Act. 1963, that are to be issued in Hindi-English bilingual form simultaneously.

- (D) What are the awards given for passing various Hindi exams under the Hindi Teaching Scheme?
- (E) What qualification in Hindi will entitle the Officers/Employees to have 'Working Knowledge of Hindi'?
- Q.1 Describe the various major and minor penalties covered under D&AR. Describe the procedure involved in removing a permanent employee from service when he is unauthorizedly absent for a long time?
- Q.2 a) What are demands for grant? What are the major heads/subheads various demands of grants concerning the electrical department?
b) What are canons of financial propriety? Explain with example.
- Q.3 Write short notes on any **Five** of the following:
- (a) HOER
 - (b) PNM
 - (c) Various types of audit inspections.
 - (d) Workmen's Compensation Act.
 - (e) Payment of Wages Act.
 - (f) Works Programme, Pink Book, LAW BOOK
 - (g) DCF technique
 - (h) Material modification
- Q.4 Describe the various types of Estimates prepared in the Railways? What are the various stages of getting a work of about Rupees 60 Lakhs (Sixty Lakhs) to be sanctioned? Give an abstract Estimate for Electrical wiring of a new station building under Passenger Amenities head?
- Q.5 a) Which are the items covered in Section 3(3) of the Rajbhasha Implementation Act for which 100% implementation is a must?
b) Why is the Hindi Week celebrated?

PART-B

- Q.1 Give 10 important causes for recent either Electric Loco or EMU/MEMU failures? Also, describe the maintenance procedures, which can reduce these failures?

Give 10 important causes of recent AC coach failures? Also, describe the maintenance procedures, which can reduce these failures?

Give 10 important causes of recent TRD failures? Also, describe the maintenance procedures, which can reduce these failures?

- Q.2 Describe the various causes of tripping without apparent cause in the 25 Kv AC system? What are the harmful effects of these trippings? What are the measures that can reduce the trippings?
- Q.3 What are various types of batteries under in TL & AC coaches? What is the schedule of maintenance for these batteries? Also, describe the procedure for revival of dead/weak cells?
- Q.4 Write short notes on any **Five** of the following:
- a) Importance of Q-44 and Q-118 relays in electric locos.

- b) Importance of DBR in Electric Locos.
 - c) Causes of wheel slip in Electric Locos.
 - d) Wheel measurements like root/flange wear and its importance.
 - e) Maintenance Schedules of Electric Locos.
 - f) Fire prevention measures in Electric Locos OR coaches.
 - g) Reasons for adopting metalized carbon strips in pantographs.
- Q.5 Give the layout of Electric Loco Shed or EMU Car Shed? Explain the activities of various sections and the role of PPIO.
- Q.6 Give the layout of 132kV/25kV Traction Sub-station. Give the important protection devices for the 25kV AC system.
- Q.7 a) Give the advantage of 110 V Train Lighting system adopted by Indian Railways.
- b) Explain the difference between RMPU and Conventional AC coaches? Explain the advantages of RMPUs.
- Q.8 Explain **any five** of the following:
- a) SEC and the measures to control the same.
 - b) Measures to control Power Factor in Substations.
 - c) Different types of energy meters.
 - d) Different types of TL alternators and Regulators.
 - e) Maintenance schedules of 8-wheeler tower car.
 - f) Importance and use of TDRs in Electric Locos.
 - g) Arno convertor Vs. SI unit.
 - h) Importance of Trip Inspection for Electric Locos.
- Q.9 a) Describe in detail the training schedule of a recently recruited Traction Assistant.
- b) Describe the duties of the Traction Assistant/assistant loco pilot while on Foot Plate.
- c) Recommendations of RSRC in respect of Running staff.
- Q.10 Write short notes on any **Five** of the following:
- a) Use of energy efficient devices.
 - b) Preventive maintenance of DG sets.
 - c) Safety measures to prevent Electric shocks.
 - d) Importance of Earthing in electric installations.
 - e) Preventive maintenance of UPS.
 - f) DGA of transformer oils.
 - g) Advantages of split type AC system.
 - h) Advantage of MCB/MCCB over fuses.
- Q.11 Give brief answers to all questions:
- a) What are the different Alternator Rating adopted in Passenger coaches (TL/AC) in Indian Railways.
 - b) What are the common defects in the fitment of V-belts? What are the number of belts in TL/AC coaches, RMPU system?
 - c) Name important protections in a 33kV/400 V substation?
 - d) Why is neutral section necessary in 25KV AC system? Mention the types of neutral sections in use?
 - e) What is the difference between an un-insulated and insulated overlap?
 - f) List the functions of QD, QOP, QLM and QRSI ?
 - g) Under what circumstances the Driver should switch on Flasher light?
 - h) Briefly list the installations which require EIG sanction before energisation?
 - i) Why is the Return Conductor being removed from the 25kV AC OHE?

- j. Briefly list the various types of pumps in use?
- Q.12 a) Draw the line diagram of a power circuit of an AC locomotive or EMU? List the various protection relays and their function for loco or EMU?
 b) Mention the ratings of important equipments in locomotive or EMU?
- a) Describe the power supply arrangements for Train Lighting and Air Conditioning of coaches?
 b) Discuss the advantages of EOG over the conventional self-generating system?
- Q.1 Draw a schematic power supply diagram of a WAG5 loco indicating the equipments from Panto to SL. Describe their functionary also.
- Draw a schematic diagram of a traction substation from incoming & supply up to feeding post for a double line section. Describe various equipment therein.
- Draw a schematic diagram of the air conditioning system of a ACCW & describe the working of the equipment therein. Also draw the schematic power supply diagram of the TL circuit of a sleeper coach.
- Q.2 a) Calculate the power factor.
 Fig:-
- b) Calculate equivalent capacitance C_{eq}
 Fig:-
- c) Explain $\frac{\text{Energy Saved}}{\text{Energy Produced}}$.
- d) What measures will you take to improve the reliability of a Lead Acid Battery in use?
- e) Write short notes on:
 i. SCADA
 ii. Megger
 iii. Railway Electrification
 iv. Electrical Inspector to Govt. of India for Railways.
 v. Corona discharge
- Q.3 Fill in the blanks.
- a) A 1000 watt heater used for 6 hours daily in the month of April will consume _____ Units.
- b) Level of illumination in II class TL coach with FL tubes should be _____ lux.
- c) The weight to be applied to check V belt (Fenner Make) tension is _____ Kg.
- d) Rating of alternator used in RMPU type BG AC coach is _____ KW.

- e) Capacity of Battery of Jan Shatabdi Chain Car is 4 AH.
 - f) One Kilowatt = 1.34 HP.
 - g) Capacitor opposes instantaneous change of voltage.
 - h) The colour of moisten silicagel is blue.
 - i) Core of transformer is made of laminated steel.
 - j) Carbon tetrachloride material is recommended as fire extinguisher in electrical fire cases.
- Q.4 Explain in detail with suitable sketches system of working of self-generation, mid-on generation, end on-generation & head on generation used for feeding TL & AC load of coaching trains. What are the advantages & disadvantages of each system? What are normally being used and what is the status of other systems as to why those are not being used?
- Q.5A i. Indian Railways official language implementation committees are constituted at what different levels? And what intervals these committees meet?
- ii. Who is the president of Hindi Advisory Committee of Ministry of Railways?
 - iii. What are the three main Hindi examinations conducted for Railway staff for proficiency in Hindi?
 - iv. Explain the measures you will take for wide spread use of Hindi in Railway Working.
- B. Translate in Hindi
- i. General Manager
 - ii. Divisional Railway Manager
 - iii. Sanctioned
 - iv. Casual Leave
 - v. Workshop
- Q.6 Explain in Brief.
- i. Factory Act.
 - ii. Workman Compensation Act.
 - iii. Incentive Scheme
 - iv. Industrial dispute act.
 - v. Over time.
- Q.7. Write short notes.
- i. August Review
 - ii. Preliminary Works Programme
 - iii. Rolling stock Programme
 - iv. Reliability Register
 - v. Pink Book and Green Book.

Questions One to Four (1 to 4) are compulsory. Do any two of remaining.

Q.No.1 Answer the following

- a) Normally a 58-N Box loaded train rake a trailing load is 3200, 4000, 4850, 5800 T.
- b) WAG7 locomotive has 4 HP. [3900, 5000, 6000, 6500]
- c) STATIC inverter in Electric loco are replacing existing rotating machine called dynamo.
- d) Normal Brake pipe pressure in Air brake loco/stock is 5 Kg/Cm².
- e) What can be maximum wheel dia in a locomotive? 600, 650, 700, 750 mm.

- [1036, 1016, 1092, 1126]
- f) Name the relay which comes in the autoregression circuit of WAG 5 loco
 - g) A-9 valve in electric locomotive hasnumber of application zones.
[3, 4, 6, 8]
 - h) In WAG5 loco traction force is transferred from the bogie to the body of loco throughé é é [Side bearer, traction bar, centre pivot, CBC]
 - i) Nominal cross section are of a contact wire is é é é é Sq.mm.
[65 Sqmm, 107 Sqmm, 165 Sqmm]
 - j) Outputs of é é ..and é é é ..are taken as inputs for distance protection relay
[AT, 25KVPT, 25 KVCT, 132 KVCT, 132KVPT]
 - k) Secondary side voltage of a 25KVPT type1 used in SSP is nominallyé é ..volt.[72V,96V,100V,110V]
 - l) Separator between two contact wire in an insulated overlap is kept as é é .mm.
 - m) In a conventional type OHE turnout, the é é contact wire will be é ..mm below the turn out contact wire.(25mm, 40mm, 50mm, 70mm)
 - n) é é é ..KW Alternator is used in AC 3 tier coaches.
 - o) What is full form of VRLA batteryé é é é é é ..
 - p) What is specific gravity of fully charged Lead Acid battery in a coach? (1160, 1190, 1210, 1260)
 - q) é é é é é é é .. is the Electrical Inspector to the Govt. of India for Electrical installations under East Coast Railway.
 - r) Earthing resistance for electrical installation of a Rly. Quarter should be maximum é é é ..ohms.
 - s) Name two posts in Electrical department which are non-selection posts.
 - t) OTHER Electrical works are sanctioned UNDER plan headé é é é

Q.No.2 What are the different maintenance schedules for WAG5 locomotives? Describe in brief salient features of items attended in each schedule including their periodicity. (Answer should not exceed 200 words)

Draw a schematic diagram of 132 Kv/25 Kv traction sub-station from in coming supply to a feeding post for a double line Rly. Section. Briefly mention about each equipment.

Describe with diagram in detail the question test conducted for alternators of AC coaches. What items are checked during trip inspection at primary depot by Electrical staff for AC coach.

Q.No.3 Please briefly mention the measures adopted for energy conservation in

- a) Traction Area
- b) Non-traction Area

Q.No.4 Write short note on any two of the following

- a) Advantages of RMPU over conventional AC coaches.
- b) Submersible plum installation on Rlys.
- c) Trouble shoot up if QOP relay drop.
- d) Rules for driving train in foggy weather.
- e) Insulated overlap in conventional OHE.
- f) PNM (Permanent Negotiation Machinery)

- Q.No.5 Translate in Hindi.
- i) Chairman Railway Board
 - ii) Member (Electrical)
 - iii) East Coast Railway
 - iv) Work Shop
 - v) Maintenance depot
 - vi) Sanctioned
 - vii) General Manager
 - viii) Electrical Inspector
 - ix) Energy Conservation
 - x) Electricity Act.
- Q.No.6 Explain in brief.
- a) Final modification estimate.
 - b) Machinery & Plant Programme
 - c) Liability Register
 - d) Preliminary Works Programme.

East Coast Railway

Question paper for selection to group 'B' post of AEE scale Rs. 9300-34800 and G.P. of Rs. 4800 against 30% LDCE quota in Electrical Deptt.

Date : 01.03.2009

Max./Qualifying Marks 150/90

Time : 3 Hrs.

Professional Paper – II (II)

Note : (i) Answer to be written either in blue or black indelible ink and no other ink or pencil be used otherwise answer sheet shall not be evaluated.

However sketches/diagrams can be drawn by pencil only.

ii) Questions may be answered either in Hindi or English.

(iii) Marks are indicated against each question.

(iv) Attempt any five (5) Q. in Part I.

(v) Q.14 in Part II and Q. 17 in Part III are compulsory. And attempt one Q. more in both these Parts II and III.

vi) In case of any ambiguity/confusion/discrepancy between English and Hindi version of the Q. paper, English version shall be taken as correct.

Part I 100
Part II 14 Com +1
Part III 17 Comp +1
28

Part I – Professional

100

- Q.1 a) What are the various improvement measures taken by IR and ECoR in particular in TL/AC coaches for passenger amenity and safety?
Enumerate. **10**
- b) What is the difference between preventive maintenance, trouble shooting and repair ? **5**
- c) What is provided in Rule 4 of Indian Electricity Rule, 1956? Describe the details of electric shock treatment. **5**
- Q.2 a) What is trickle charge of lead acid batteries? **5**
- b) Define and describe the causes and methods of restoration of sulphated battery. **5**
- c) Describe probable causes of electric fire in a TL coach. What aspects need to be examined in a TL coach involved in fire? **10**
- Q.3 a) What are advantages of an improved power factor? Calculate the rating of a capacitor required to improve the p.f. of a 5 kW load from 0.5 to 0.9? **10**
- b) Compare the advantages/disadvantages of a centrifugal pump with reciprocating pump ? **5**
- c) Enumerate various types of fault which occur in a 3 ϕ power supply system. **5**
- Q.4 a) Write down the brief specification and important parameters of a 500 kVA power distribution transformer. **5**

(5)(0.5) To (60 - 128.84

b) What are the points to be checked while inspecting the earthing arrangements? 5

c) Define any **five(5)** of the following : 10

- i) Miniature circuit breaker ; ii) Cable PVC sheathed ; iii) Sub circuit
- iv) Illumination ; v) Color rendering ; vi) Maintenance factor of luminaires ; vii) HRC fuses

Q 5 Write short note on **any four(4)** of the following : 20

- i) Dyna drive ; ii) Bench marking vs. Yardstick of staff for TL/AC maintenance ; ~~iii) Regulated vs. Unregulated OHE ; iv) Various safety equipments/measures at a power supply or traction sub-stations ; v) Electricity Regulatory Commission ; vi) Pre monsoon checks of electric locomotives ; vii) ODC movements in electrified territory ; viii) VRLA vs. Flooded batteries for rolling stock ;~~
- ix) Various type of OHE masts ; ~~x) Various type of batteries used for TL/AC coaches, their capacities ; xi) Use of composite brake blocks in AC locos.~~

Q 6 Write **only the answers** in the answer-sheet. Each part carries equal mark. 20

- i) Net energy saved during regenerative braking of an electric train
 - a) is independent of the train weight
 - b) decreases with reduction in train speed due to braking
 - c) increases with increase in specific resistance
 - d) increases with increase in down gradient
- ii) Electric heating is considered advantageous over other systems of heating (coal, oil or gas heating) as
 - a) it is economical, clean, hygienic, efficient and safe in operation.
 - b) it provides better working conditions, automatic protection against overheating and simple, accurate and reliable temperature control.
 - c) there is no upper limit to the temperature attainable except the ability of the material to withstand the heat.
 - d) all of the above
- iii) The thermal properties of XLPE cable permit max. continuous conductor temp. of
 - a) 80°C ; b) 90°C ; c) 100°C ; d) None of these.
- iv) Maximum stagger of contact wire at support on tangent track as well as on curved track are $(\pm)$mm. and $(\pm)$ mm. Respectively.
- v) The combined earth resistance of the system is not allowed to exceed the following limits ;
 - a) Traction sub-station Ω .
 - b) Switching station Ω .
 - c) Booster transformer station Ω .
 - d) Aux. Supply transformer station Ω .

- vi) Tractive effort is the product of and effective weight on driving axles.
 - vii) BO-BO-BO arrangement of wheels has no. of traction motors and no. of axles per loco.
 - viii) In CO-CO bogies, centre pivot shares..... % and each side bearers shares % of vertical load .
 - ix) The permissible voltage variation at the point of commencement of supply on a 22kV supply system, according to IE Rules is ;
a) $\pm 5\%$; b) $\pm 6\%$; c) $\pm 9\%$; d) $\pm 12.5\%$
 - x) Track crossing for a voltage exceeding 11 kV will normally be
a) thru' cable ; b) thru' OH line ; c) either thru' cable or OH line
- Q.7 a) Describe in detail the procedure adopted and precautions to be taken in conducting **any one** of the following tests. Indicate also the usual acceptable range of values : 10
 Dielectric test ; 70% test on OHE insulator ; Earth resistance test ; Current Collection test ; Tan delta test ; Negative bonding test ; Continuity test on Trains.
- b) Explain three(3) most likely causes of failures/defects in **any one** of the following equipment as relevant to its use on IR. Remedial action being adopted on your railway is also to be mentioned. 10
 EM contactors ; V-belts of TL coaches ; 11/415 kV transformers ; 25 kV LA ; TM flashovers ; AC failures in RMPU coaches ; DJ/VCB closing circuit.
- Q.8 a) Enumerate the methods being adopted on IR for controlling the consumption of **any one** of the following high value category items used in electrical equipments on railways ; 10
 Maneuropo compressors ; Bearings ; Carbon brushes ; RC fan armatures ; Lubricants ; Impellers/Fans ; Lamps/FL tubes in residential buildings.
- b) Write down the typical rating to enable its correct procurement of **any one** of the following equipment used in railways ; 10
 Wires used in house wiring ; Submersible pump set ; AT used on 25 kV ; UG cable ; Capacitors used in any particular application.
- Q.9 Attempt any **two(2)** of the following and describe in detail ; 20
- a) What are the common defects in fitment of V-belts? What are the total no. of V-belts in a TL and RMPU AC coach?
 - b) What are the reasons for providing an inverter in a RMPU type AC coach? List out the passenger amenity item being provided and planned by electrical deptt. in a WGACCN coach.
 - c) Why OHE is provided with a stagger? Give representative values of stagger on straight/curved sections.
 - d) List out five(5) possible reasons for spurious tripping of a CB in 25 kV OHE system.

- e) What is SEC? Give the representative value for WAT and KUR divns?
- ✓ f) Draw a line diagram of the power circuit of an AC locomotive indicating the various equipments. List the functions of QD, QOP, QLM, QRSI.
- g) Distinguish between load factor, power factor, and diversity factor.
- h) What do you understand by CFL lamp/tube? How is it different from earlier FL tube?

Q.10 Answer **any two (2)** of the following : 20

- i) What are the types of wheel provided in an electric locomotive? Draw a neat diagram of the latest adopted profile of the wheel of an electric locomotive indicating the different portions of it and mention the permitted values for the same.
- ii) How the torque is transmitted in an electric locomotive from the traction motor to the draw bar for the purpose of pulling the train?
- iii) What are the different signalling lamps provided in a WAG7 loco? How the status of equipments associated with them is conveyed to the Driver?
- iv) Why bogies require squaring and how is it done? Describe in details.

Q.11 Answer **any two (2)** of the following : 20

- i) What are the items of OHE, a lineman should observe while patrolling on electrified section?
- ii) Describe various works to be carried out during AOH of OHE?
- iii) What do you understand by tariff? Describe the salient features of tariff charged for electric traction.
- iv) Describe the commissioning tests to be carried out on 132/25 kV traction sub-station before energisation.

Part II – Establishment

25

- Q. 12 i) Can a major penalty charge sheet be converted to a minor penalty charge sheet ? 1
- ii) Will it be possible for a disciplinary authority to change the orders once passed in file in the following circumstances ? 2
- a) orders re: suspension of an employee
 - b) orders re: imposition of a penalty on a railway servant.
- iii) Can you draw daily allowance for your journey within the same municipal limits in which you are posted if the place of your visit/ temporary duty is
- a) 5 Kms. , b) 10 Kms. away from your HQ. ? 2
- iv) Define **any five** of the following :- 5
- a) Lien; b) Cadre; c) Basic Pay as per Sixth Pay Commission;
 - d) Family as per Pass rules; e) Rule 3(2) (i) of Railway Service Conduct Rule, 1966; f) Transport allowance ; g) 10- hour rule

Q. 13 Write short notes on **any Five (5)** of the following :-

10

- i) Qualifying service ; ii) Five main measures taken by Railway Administration for welfare of its employees; iii) Leave Not Due ;
- iv) Permanent Negotiating Machinery on Railways ; v) CCL as per 6th CPC ; vi) Removal vs. Dismissal from service as per D&AR; vii) Premature vs. Compulsory Retirement ; viii) Paternity Leave ; ix) Entitlement of a Gp.B officer to travel in Rajdhani Exp. on a privilege pass.

Q.14 Write **only the Answers** in the answer-sheet against each part of the following :-

15

- i) Gr.B panel for SC/ST candidates is valid for time without any restriction . (True/False)
- ii) Compensatory casual leave is admissible to supervisory staff. (True/False)
- iii) Admissibility of complimentary passes after superannuation to a Gaz. Officer with service of over 20 yrs is _____ set per year.
- iv) A non-gazetted railway servant , who is arrested for debt , is liable for dismissal. (True/false)
- v) A non gazetted railway servant promoted to a gazetted rank in an officiating capacity may continue to be an office bearer of the Trade Union if he is a member of the death and insurance scheme organised by such Union. (True/False)
- vi) In terms of RS Conduct Rule 3(1) (ii), every railway servant shall at all times maintain-----.
- vii) House rent allowance is admissible to a railway employee with out any condition if he resides separately from the spouse working in the railways at the same station and an accommodation is also allotted in the name of the spouse. (True/False)
- viii) General Manager of a Zonal Railway is competent to accept resignation of a railway employee up to the level of
- ix) The maximum amount of study leave which may be granted to a railway servant shall be months in all during his entire service.
- x) No. of school passes admissible for every children in a year is sets.
- xi) As per SOP of ECoR, a Gp.B officer can sanction advance/withdrawal from PF in case of staff in scale below(before 6th CPC).
- xii) JAG officer in the division/workshop can permit journey by road between two stations connected by rail. (True/False).
- xiii) DRM has full powers for classification of railway staff under HOER. (True/False)
- xiv) A Senior scale officer working under a JAG officer in the division/workshop cannot authorize a railway servant to proceed on duty outside a zonal railway. (True/False)

- xv) A Gp.B officer is not empowered to stop HRA admissible under the rules in the event of a gp. D employee refusing to accept the accommodation offered by railway . (True/False)

Part III – Financial Rules

25

✓ Q. 15 Attempt **any two (2)** of the following :- 10

- i) Define and distinguish between abstract estimate; detailed estimate; and completion estimate
- ii) Distinguish between Works Programme, M&P Programme, and Rolling Stock Programme.
- ✓ iii) Canons of Financial Propriety
- ✓ iv) Demand of Grants and Plan Head controlled by CEE of a railway with sub heads.
- v) What are the powers the powers of GM of a railway for material modification ? What is vitiation in a contract?

Q.16 Write short notes on **any two (2)** of the following :- 10

- a) Financial concurrence and Vetting
- b) Completion Reports
- c) Demands under Revenue
- d) Contingent charges
- e) Audit Notes and Inspection Reports

✓ Q.17 Write **only the answers** in the answer sheet :- 15

- i) In case, name of the contractors are borne on the approved list of the department, finance concurrence is not necessary for limited tenders. (True/False)
- ii) Late tenders can be accepted by GM with the concurrence of FA&CAO in exceptional circumstances. (True/False)
- iii) Two most important aspects to be seen by the signing officer in the requisition for non-stock item are:-
 - a) Description and Rate ; b) Allocation and Quantity
 - c) Quantity and Rate ; d) Consignee and Quantity
- iv) It is proposed to purchase an item of a specific brand only. For this :-
 - a) Specification should be prepared in such a way that only product of that make meets the specification.
 - ✓ b) A PAC should be submitted along with the requisition.
 - c) Requisition should be signed by an SAG officer.
 - d) A sample should be submitted along with requisition.
- v) The plan head for M&P and Railway users Amenities under Demand no.16 are and respectively.

vi) An indent for a non-stock item valuing Rs. 35,000 is to be

Signed by

vetted by

a) An Assistant officer

DRM

b) A JAG officer

nil

c) A Sr. Scale officer

DAO

d) A JAG officer

Associate Accounts officer

vii) NIT can be issued in view of extreme urgency before sanctioning of the detailed estimate with prior concurrence of associated finance and approval of ADRM. (True/False)

viii) Telephone charges are categorized as special contingent charges. (True/False)

ix) Completion estimate and completion reports are one and the same thing. (True/False)

x) Purchase orders valuing more than Rs. 1 L. are necessarily required to be vetted by finance branch.

xi) Detailed estimate need not be prepared for replacement/renewable works chargeable to revenue costing Rs. and less and for reconditioning works costing Rs. and less and only rough estimate be prepared and kept on record.

xii) A Gp. B officer can sign a contract agreement in case of contracts accepted by a Sr. Scale officer including himself. (True/False)

xiii) As per SOP of ECoR, PHOD/CHOD has got full powers for reappropriation of funds from one work to another under Works grants. (True/False)

xiv) A Gp. B officer can sanction a temporary electrical connection to outsiders upto a limit of 5 kW only. (True/False)

xv) In case of works contracts tender offers unaccompanied with the requisite earnest money shall not be entertained. (True/False)

(5) (0.5)

पूर्व तट रेलवे	
East Coast Railway	
विद्युत विभाग में 70% कोटा के तहत सहायक विद्युत इंजीनियर, ग्रुप- 'बी' के पद के लिए चयन हेतु लिखित परीक्षा का प्रश्न पत्र।	
QUESTION PAPER FOR WRITTEN TEST FOR SELECTION TO THE POST OF AEE GROUP-'B' POST IN ELECTRICAL DEPARTMENT AGAINST 70% QUOTA.	
15 मई, 2012	कुल पृष्ठा-04
15 th May, 2012	Total pages-04
समय-3 घंटे	कुल अंक-150
Time Allowed- 3 hours	Max. Marks-150
01.	भाग-'ए' से किन्हीं चार (04) प्रश्नों तथा भाग-'बि' से किन्हीं दो (02) प्रश्नों का उत्तर दें। Answer any Four questions from Part 'A' and Two questions from Part 'B'.
02.	जहां कहीं संकेत किया गया हो, को छोड़ के बाकी सभी प्रश्नों के समान अंक हैं। All questions carry equal marks except wherever indicated.
03.	यदि परीक्षार्थी निर्धारित प्रश्नों से अधिक प्रश्नों का उत्तर दे (या तो सभी या फिर किसी एक भाग से), प्रत्येक भाग के अंतिम प्रश्नों के उत्तर का मूल्यांकन नहीं किया जाएगा। In case candidate attempts more than the required number of questions (either in all or from any one part), the last attempted questions in each part will be ignored.
04.	उत्तर पत्र में मुख्य पृष्ठा में निर्धारित स्थान के अलावा कहीं भी कोई संकेत/पहचान चिह्न/हस्ताक्षर/नाम/अनुक्रमांक आदि नहीं होना चाहिए जिससे परीक्षार्थी को पहचाना जा सके। There should be no indication/identification marks/signature/name/roll number etc. anywhere inside the answer sheets, which can identify the candidate except on the cover page at prescribed location.
05.	परीक्षा समाप्ति के 30 मिनट तक कोई परीक्षार्थी परीक्षा हॉल नहीं छोड़ेंगे। No candidate is allowed to leave the examination hall till 30 minutes before the conclusion of the examination.
06.	परीक्षार्थी यह सुनिश्चित करें कि उनको उत्तर पुस्तिका के प्रत्येक पन्ने साथ ही अतिरिक्त प्रश्नों पर भी परीक्षक/प्रभारी अधिकारी के हस्ताक्षर हो। Candidates must ensure that invigilator/officer-in-charge has signed on each page of answer book as well as on extra sheets.
07.	विषयनिष्ठ प्रश्नों की उत्तर में कोई शोधन ओवरराईटींग की अनुमति नहीं है। For objective type questions, "correction, cutting, overwriting, erasing, scoring off a ticked answer and ticking another answer & modifying the answer in any way" are not allowed.
08.	उत्तर हिन्दी अथवा अंग्रेजी में दिया जा सकता है। Answer can be given either in Hindi or English.

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		PART-A
Q.1	हाल ही में या तो बिजली लोको या एसी डिब्बों या TRD विफलताओं के दस महत्वपूर्ण कारणों लिखें। इन विफलताओं को कम करने के लिए क्या कदम उठाए थे?	25
	Write ten important causes for recent either Electric Loco or AC Coaches or TRD failures. What steps were taken to reduce these failures?	25
Q.2	132/25 Kv Traction Substation के लेआउट ड्रा करें। सभी महत्वपूर्ण सुरक्षा उपकरणों के 25 केवी प्रणाली के लिए समझाएं की।	25
	Draw the layout of 132/25 kv Traction Substation. Explain all important protection devices for 25 kv system.	25
Q.3	विद्युत नियंत्रण और एयर सर्किट में RMPU एसी डिब्बों की विभिन्न सुरक्षा प्रणाली क्या हैं?	12½
(A)	What are various protection systems in power, control and air circuit of RMPU AC coaches?	12½
(B)	RMPU और पारंपरिक एसी डिब्बों के बीच अंतर की व्याख्या दें? RMPU कोच के क्या फायदा है।	12½
	Explain the difference between RMPU and conventional AC coaches? Explain advantages of RMPU coaches	12½
Q.4	हाल ही में भर्ती सहायक लोको पायलट के प्रशिक्षण कार्यक्रम का वर्णन विस्तार में करें।	10
(A)	Describe in detail the training schedule of a recently recruited Assistant Loco Pilot.	10
(B)	एक लोको पायलट के द्वारा विशेष ऊर्जा की खपत में सुधार करने के लिए लिया क्या आवश्यक कदम हैं?	10
	What are the steps required to be taken by a Loco Pilot to improve specific energy consumption?	10
(C)	"हाँ" या "नहीं" में निम्नलिखित का जवाब दें (i) डीसी श्रृंखला कर्षण मोटर्स WAG5 इलेक्ट्रिक Locos में लगे हैं (ii) पुनर्योजी ब्रेक लगाना WAG7 इंजन में उपलब्ध नहीं है (iii) स्टार रेटिंग उपकरणों की ऊर्जा क्षमता पर आधारित BEE द्वारा दिया जाता है (iv) एक नई Plan Head- 37 वर्ष 2012-13 से शुरू किया गया है (v) रेलवे विद्युत कर्षण टैरिफ Odisha में दो भाग टैरिफ है	1 x 5 = 5
	Answer the following in "yes" or "no" (i) DC series traction motors are fitted in WAG5 Electric Locos (ii) Regenerative braking is not available in WAG7 locos (iii) Star rating is given by BEE based on energy efficiency of appliances (iv) A new plan head 37 has been introduced from 2012-13 (v) Tariff for railway electric traction is two part tariff in Odisha	1x5=5

Q.5	निम्नलिखित पर छोटे नोट लिखें:- (क) रूट और flange wear. (ख) इलेक्ट्रिक लोकोमोटिव के सुचित रखरखाव (ग) डिब्बों के आग निवारक उपायों पर (घ) ट्रांसफार्मर तेल पर DGA (ङ) ICDJ के लिए trouble shooting.	5 x 5 = 25
	Write short notes on the following:- (A) Root wear and flange wear (B) Maintenance schedules of Electric Locomotive (C) Fire preventive measures on coaches (D) Dissolved gas analysis on transformer oil (E) Trouble shooting for "ICDJ"	5x5=25
Q.6	निम्नलिखित की व्याख्या करें:- (क) Substation में सत्ता कारक (power factor) नियंत्रण करने के उपाय (ख) बिजली प्रतिष्ठानों में earthing (ग) पावर कार की रखरखाव कार्यक्रम (घ) TL डिब्बों में प्रयोग के अलग प्रकार के regulators. (ङ) विद्युत लाइन क्रॉसिंगों energisation पहले के लिए चेक (checks)	5 x 5 = 25
	Explain the following:- (A) Measures to control Power Factor in substation (B) Earthing in electrical installations (C) Maintenance schedules of Power Car (D) Different types of Regulators used in TL coaches (E) Checks for Power line crossings before energisation	5x5=25
		PART-B
Q.1	निम्नलिखित पर छोटे नोट लिखें:- (क) PNM और PREM (ख) रेल सेवा संचालन नियम 1966 का 18 (3) नियम (ग) रेलवे सेवक डी एंड ए. आर. 1968 के 20 और 17 नियम (घ) LAP का नकदीकरण (ङ) मजदूरी अधिनियम के प्रमुख विशेषताये	5 x 5 = 25
	Write short notes on the following:- (A) PNM & PREM (B) Rule 18(3) of the Railway Service Conduct Rules 1966 (C) Rule 17 and 20 of the Railway Servant D&AR 1968 (D) Encashment of LAP (E) Salient features of Payment of Wages Act	5x5=25

Q.2	निम्नलिखित की व्याख्या करें:- (क) वित्तीय औचित्य की Cannons (ख) सामग्री संशोधन (ग) विभिन्न प्रकार का लेखा परीक्षा निरीक्षण (घ) शेयर (Stock) और गैर शेयर (Non-stock) आइटम के बीच अंतर (ङ) एम एंड पी कार्यक्रम	5 x 5 = 25
	Explain the following:- (A) Cannons of financial propriety ✓ (B) Material modification ✓ (C) Various type of audit inspections ✓ (D) Difference between Stock and Non-stock items ✓ (E) M&P Programme ✓	5x5=25
Q.3	(A) विभिन्न राजस्व मांगों का वर्णन करें (ख) शब्द "लेखानुदान" की व्याख्या करें (ग) राजभाषा अधिनियम 1963 की धारा 3(3) के तहत क्या दस्तावेजों द्विभाषी हिन्दी, अंग्रेजी के रूप में साथ ही साथ जारी की जानी हैं? (घ) विभिन्न हिन्दी शिक्षण योजना के तहत क्या पुरस्कार हिन्दी परीक्षा पारित करने के लिए दिए गए हैं? (ङ) अधिकारियों / कर्मचारियों के लिए क्या शैक्षणिक योग्यता working knowledge of Hindi के लिए चाहिए	5 5 5 5 5
	(A) Describe various revenue demands (B) Explain the term "Vote on Account" (C) What are the documents coming under section 3(3) of official language Act 1963, that are to be issued in Hindi-English bilingual form simultaneously? (D) What are the awards given for passing various Hindi exams under the Hindi Teaching Scheme? (E) What qualification in Hindi will entitle the Officers / Employees to have 'working Knowledge of Hindi'?	5 5 5 5 5

GROUP A

1. Give 10 important causes for recently occurred or most apprehended failures in your field of work (From either TRO/ TRS/ AC/ TL/ GS/ or TRD). Describe the maintenance procedures which can reduce these failures.
काम के अपने क्षेत्र से (या तो ट्रांसमिशन / ट्रांसमिशन / एसी / टेल / जी एस / या ट्रांसमिशन) में सबसे संभावित या हाल ही में हुए विफलताओं के लिए 10 महत्वपूर्ण कारणों को लेख करें। रखरखाव प्रक्रियाओं जो इन विफलताओं को कम कर सकते हैं उनका वर्णन करें।
2. Write short Notes on any **five** of the following:
निम्नलिखित में से कोई पांच पर लघु नोट लिखें।
 - (a) Rate of Return (ROR) (क) आर और आर (ROR)।
 - (b) Salient features of Payment of Wages act. (ख) Payment of Wages अधिनियम का मुख्य विशेषताएं
 - (c) Rolling Stock Programme. (ग) रोलिंग स्टॉक Programme।
 - (d) Material Modification. (घ) सामग्री संशोधन।
 - (e) Hours of Employment Regulation (HOER). (ई) काम का घंटे अधिनियम (HOER)।
 - (f) Minor penalties as per DAR (च) DAR के अनुसार लघु दंड।
 - (g) procedure of making a new Item as a Stock item. (छ) एक नया आइटम स्टॉक आइटम के रूप में मान्यता देने की प्रक्रिया।
 - (h) Procedure for procuring an item under PAC. (ज) पीएस के तहत एक आइटम खरीद के लिए प्रक्रिया।

GROUP B

1. Why is there need to conserve energy? Briefly mention various measures being taken in Indian Railways to conserve energy in the field of Electrical General Services.
ऊर्जा संरक्षण की आवश्यकता क्यों है? भारतीय रेलवे में विद्युत सामान्य सेवा के क्षेत्र में ऊर्जा संरक्षण के लिए ली जा रहा विभिन्न उपायों को संक्षेप में उल्लेख करें।
2. Draw the schematic lay out of 33/0.4kV substation giving names and functions of various equipments. Describe various protective devices provided and safety measures taken in a 33 kV electric substation for safety of equipment and working personnel.
विभिन्न उपकरणों के नामों और कार्यों के साथ एक 33 / 0.4kV सबस्टेशन के ढांचे को प्लेआउट करें। एक 33 केवी विद्युत सबस्टेशन में सुरक्षा उपकरण और काम कर रहे कर्मियों की सुरक्षा के लिए उपलब्ध विभिन्न सुरक्षा उपकरणों और उपायों का वर्णन करें।
3. Describe various types of tariffs applicable for electrical energy in the field of Electrical General services. Explain various elements /parts of tariff. Define power

factor. Briefly describe importance and functioning of capacitor banks to improve power factor.

व्ययुत जनरल सेवाओं के े मव्ययुत ऊजाके लए लागू ववभन ंकार शुंक का वणन कर। टैरफ के ववभन तव/ भागसमझाएँ । power factor को पशभाषत कर संपे मcapacitor बकके महव और power factor सुधार करने के लए कामकाज का वणन कर।

4. Draw the sketch of Air conditioning cycle. Describe the functions performed by various equipments of this cycle. Briefly describe the round trip maintenance schedule done at primary depot for AC coaches.

एयर कंडीश जंग cycle के केच ा कर। इस cycle के ववभन उपकरण के वारा जपादत कायका वणन कर संपे मएसी कोच के लए ाथमक ङपो पर क्रया round trip रखरखाव अनुसूची का वणन है।

5. Describe various protective measures taken in coaches to prevent Electrical fires. Describe the working of OVP relay.

वजलकआग रोकने के लए कोच मकए गए ववभन सुर ामक उपायका वणन कर। OVP एले ककायणालका वणन कर।

6. What are various types of batteries used in coaches? What is the schedule of maintenance for these batteries? Describe the procedure for revival of dead/weak cells?

कोच मइतेमाल ववभन ंकार बैटरके उलेख कर। इन बैटरके लए रखरखाव क अनुसूची ा है? मृत / कमजोर बैटरके पुनार के लए ा या का वणन कर।

1. Draw normal cantilever assembly of OHE giving names of important components. What are comparative advantages and disadvantages of porcelain insulators and composite insulators?

महवपूणघटक के नाम दे के सामाय cantilever assembly क ा कर। पोसलेन इंसुलेटर और कॉमपोजीट इंसुलेटर का तुलनामक फायदे और नुकसान ा ह।

2. Draw schematic of 132kV/25kV Traction substation giving the names and functions of various equipments.

ववभन उपकरणके नाम और कायके साथ 132kV / 25kV ाशन सबंशेन के ढांच के प ा कर।

3. Why neutral sections are provided? What are the various types of neutral sections being provided in Indian Railways? Describe advantages/disadvantages of types of neutral sections.

यneutral sections लगाए जाता है? भारतीय रेल म ववभन neutral sections क्तने ंकार के ह। ववभन ंकार Neutral sections के लाभ / हाज का वणन कर।

4. Give representative sectioning scheme for OHE of double line section. Explain purpose of providing various Posts in the scheme.

डबल लाइन खंड के OHE के लए सामाय सेशजंग योजना दजिए। योजना मववभन Posts लगाने के उय को पट कजिए।

5. Why regulation of OHE is required? Describe working of 3 pulley type ATD. What is the importance of Anticreep arrangement.

OHE के regulation क्या आवश्यक है? 3 पुलों के कार ATD का काम वणन कर। एंटरी प्रणवणथा का क्या महव है।

6. Describe protection scheme for 25 kV AC OHE. Describe protection scheme of transformers provided in traction sub-stations.

25 केवी एसी OHE के लिए सुर र योजना का ववरण द। कषण उप-टेशन मउपलध कराए गए ंसफाम कसुर र योजना का ववरण द।

1. Describe the safety checks to be done before giving fitness to the electric locos in out pits. What are the measurements to be taken in a derailed Loco.

Output मबजल के इंजन के फटनेस देने से पहले क्या सुर र जाँच क्रया जाना है। पटर से उतर गई एक लोको म क्या क्या माप लया जाना ह।

2. Define specific energy consumption (SEC). Enumerate factors affecting specific energy consumption. What actions should be taken for improving SEC.

Specific Energy Consumption (एसईसी) को परभाषत कर। एसईसी को ंभाषत करने वाले कारक कउ लेख कर। एसईसी म सुधार के लिए क्या कारवाई लया जाना चाहिए।

3. What is the difference between rheostatic braking and regenerative braking. How does regenerative braking work?

Rheostatic र और regenerative र म क्या अंतर है। regenerative र कैसे काम करता है?

4. Define adhesion. Describe the factors affecting adhesion. Explain the reasons for stalling of trains. Describe the precautions to be taken to avoid stalling of trains.

Adhesion को परभाषत कर। adhesion को ंभाषत करने वाले कारक का वणन कर। ण के stalling के कारण क क्या या कर। ण के stalling से बचने के लिए सावधान्य का उ लेख कर।

5. Describe the advantages of 3-phase locomotives over conventional AC electric locos. Mention main differences in equipments provided in 3-phase locos vis-à-vis conventional AC electric locos.

पारंपरिक एसी बजल के इंजन से 3-phase इंजन के लाभ का वणन कर। 3-phase लोको और पारंपरिक एसी लोको के उपकरण म मु य अंतर का उ लेख कर।

6. What are the differences in schedules of maintenance in WAG7 loco and WAG9 Loco? Briefly describe the various sections in an Electric loco shed. Explain the activities and the role of PPIO organisation.

WAG7 और WAG9 लोको म रखरखाव के काय म मभनता क्या ह। इलेक्ट्रिक लोको शेड के वभन अनुभाग का वणन कर। PPIO संगठन क कायकलाप और भूमिका का क्या या कर।

Question Bank for Main Paper

Electrical Engineering

Q1 (a) How is the uniform wear of the 'pantograph strip' due to rubbing with contact wire ensured in OHE ?

(b) Draw sketch of a 'Cantilever assembly' of OHE, name different parts and show location of Contact and Catenary Wires.

Q.2 Explain what do you understand by the following ?

- a. *DC viz a viz AC Traction*
- b. *Circuit Breaker*
- c. *Electric Energy Conservation*
- d. *End-on- Generation*
- e. *Factor of AC comfort*
- f. *LHB*
- g. *Flasher Light*

Q.3 Explain the working of 'Air Conditioning system' of AC coach with the help of sketch.

Q.4 (a) What is the difference between 'regulated & unregulated OHE'?
How is OHE regulation achieved?

(b) What are the functions performed by the following equipments in an electric loco?

- a. *Tap Changer*
- b. *Baby Compressor*
- c. *Arno Converter*

Q.5 (a) Write brief note on the following:

- a. *Neutral Section*
- b. *Rail Bonds*
- c. *Power Block & Traffic Block*

(b) For a WCAM1 Co-Co 123 T locomotive, indicate the following:-

- a. *Type of Traction*
- b. *Type of Service*
- c. *Number of Traction Motors*
- d. *Axle Load*

Q.6 Write brief notes on -

- a. *Breath Analyser Equipment*
- b. *Tractive Effort and Adhesion*
- c. *Electrical Clearance*
- d. *Difference in requirements of Goods & Passenger Locos*
- e. *Various types of Brakes on electric locomotives*
- f. *Electric Loco Maintenance Schedules*

Q.7 Draw 'power circuit' diagram of an AC electric loco.

Q.8 Write brief notes on any four

- a. *EMU*
- b. *Safety item on Loco*
- c. *Traction Sub Station*
- d. *Various Train Lighting Systems*
- e. *Roof Mounted Package Unit*
- f. *3-Phase Loco*

Q. 9 Please mark the correct answer.

1. Axial distance between catenary & contact wire at the OHE support in vertical plane is called ?

- (a) *implantation* (b) *gradient of OHE* (c) *encumbrance* (d) *stagger*

2 The fittings, which is used to transfer the weight of contact wire to the catenary wire is called ?

- (a) *section insulator* (b) *Jumpers* (c) *cantilever assembly* (d) *droppers*

3 In regulated OHE, how much tension is kept in OHE?

- (a) *as per tension / temperature chart* (b) *3000 kg*
(c) *2000 kg* (d) *1500 kg*

4 What is the distance of caution boards from neutral section location ?

- (a) *100 m. & 500 m.* (b) *2000 m. & 1000 m.*
(c) *500 m. & 250 m.* (d) *250 m. & 150 m.*

5 The distance between centre line of the track to the nearest face of the structure is called ?

- (a) *clear span* (b) *track separation* (c) *implantation* (d) *track clearance*

Q. 10 WAG4 B-B loco is provided with 1540 horse power motors.

For this loco, please indicate

- (a) *Gauge* _____.
- (b) *Type of Traction* _____.
- (c) *Total Horse Power* _____.
- (d) *No of bogies* _____.
- (e) *Type of Service* _____.

Q.11 Describe organization of electrical department in an electrified division. Please indicate responsibilities of each officer.

Q.12 Describe Train lighting systems used in non AC coaches on IR.

Q.13 Explain the following terms in context of 25kv AC traction distribution system.

1. *Portal*
2. *Neutral Section*
3. *Stagger*
4. *Isolator*

5. *Remote Control Center*

Q.14 For a conventional AC loco motive please explain the following-

- I. *Tap change*
- II. *DJ*
- III. *Regulating winding*
- IV. *Rectifier*
- V. *Dynamic Brakes*

Q.15 (a) Please indicate various types of train lighting systems.

(b) Please name the factors governing comfort of a passengers in an air-conditioned coach.

Q.16 (a) Who is designated EIG on Indian Railways? What is his role?

(b) A tube light rated 50 watts (electric powers) is used for 10 hours per day for 30 days in a month. How much electric energy is being consumed by it per month?

Q.17 For 25 KV AC traction OHE system explain the following

1. *SPAN*
2. *Setting Distance*
3. *Encumbrance*
4. *Portal*

Q.18 (a) Please draw various warning board provided to inform loco pilot about approaching neutral section?

(b) In a 25 KV OHE system specify the following for contact wire used?

1. *Material*
2. *Shape*

Q.19 RDSO has designed a new locomotive which will be known as YAP1 Bo-Bo. It uses DC traction motors, each capable of delivering 500 kilowatt of power output. Total weight of the loco is 80 tonnes. Please indicate-

1. *Loco is capable of delivering _____KW electrical power.*
2. *What is the weight per axle?*
3. *Loco is ment to be used on _____gauge for service and uses _____mode of traction.*

Q.20 Please draw a diagram indicating flow of electrical energy from OHE to traction motors in a conventional DC traction motor in an electric loco.

Q.21 Indicate various types of breaks which could be provided in an electric locomotive. Which of these breaks is more energy efficient and why?

Q.22 For minimizing the length of OHE to be isolated under fault, various kind of switches are used. Please mention these along with associated features in terms of their capability to sense fault, open on load and possibility of remote operation. Name the section of OHE controlled by these switches.

Name of the switches	Capable of			Name of the section of OHE controlled
	Fault sensing	Opening on load	Remote operational	
1				
2				
3				

Q.23 How is speed of an electric loco controlled? Please explain briefly.

Q.24. What is the purpose of OHE regulation? How is it achieved ?.
How much tension is kept in regulated OHE.

Q.25 Please indicate the illumination levels provided at following locations?

- a. *ASM room*
- b. *Booking Window*
- c. *Officers Chamber*
- d. *Operation theatre in Hospital*

Q.26 Write various advantages of using high mast tower lighting viz a viz Sodium lamps in circulating areas.

Q.27 Draw a schematic diagram of Power supply distribution substation for a rly colony.

Q.28 Write advantages of 'Underground cable' with respect to 'Overhead line'.

Q.29 What are the different type of fire extinguishers used for different type of fires. Describe in brief working of fire extinguisher used for 'electrical fire'.

Q.30 Indicate power of following electrical appliances-

- a. *Incandescent Lamp*
- b. *T5 Tube light*
- c. *Ceiling fan*
- d. *Light socket (5mpr)*

e. 1.5 tone window AC

f. Electric iron

Q.31 Write short note on two flat rate terry and two parts terry system.

Q.32 Write short note on UPS and its usage in railway system.

Q.33 What are the advantages of 'sealed maintenance battery' with viz –a- viz conventional battery.

Q.34 describe in brief various 'fire preventing measures' taken in a coach on Railway system.

Q.35 What are different types of pumps used in Railway colony. Write short note on any one of them.

Q.36 What are the criteria taken in to consideration while deciding pump capacity .

Q.37 Write ten steps taken for 'energy conversation' in railway system in a non electrified territory.

Q.38 Write short note on different type of train lighting system used in Indian Railways.

Q.39 Draw a schematic diagram of '110V DC train lighting system'.

Q.40 Write note on capacity of different batteries used in various type of coaches in IR.

Q.41 Write short note on level of illumination followed in different type of coaches in IR.

Q.42 Please indicate various types of maintenance schedules carried out in AC coaches.

Q.43 Draw typical schematic diagram of typical 'Traction sub –station'.

Q.44 Write short note on following-

a. SSP b. BSP c. CFP

Q.45 Write short note on Remote Control Centre.

Q.46 What are the different type of OHE bonds used in electrified territory .

Q.47 Write short note on following-

a. Sub sector, b. Elementary section, c. Sector d. Tension length

Q.48 Write short note on following-

a. Stagger b. Setting distance c. Insulated overlap d. Neutral section

Q.49 Write short note on following-

*a. Different type of Traction masts Used in OHE
b. Different type of Foundations
c. Different type of portals*

Q.50 Write short note on following-

*a. Type of insulators
b. Type of jumpers*

Q.51 Draw sketch of following-

- a. *Structure bond*
- b. *Draper assembly*
- c. *Side bearing foundation*
- d. *BFB type mast*

Q.52 Write short note on quota of scheduled monthly inspections to be carried by TRD officers in a Division.

Q.53 The floor diagram of different equipments of electric locomotives.

Q.54 Write short note on

- a. *Arno convertor*
- b. *Tap changer*
- c. *SL*
- d. *SIU*

Q.55 Indicate wheel arrangements for following type of locomotives-

- a. *WAG4*
- b. *WM4*
- c. *WAP5*
- d. *WAG6*

Q.56 What are the different maintenance schedules carried in an passenger & goods Electric Loco?

Q.57 What are the different classifications of running staff from safety gradation point of view?

Q.58 Write short note on following-

- a. *PME*
- b. *LRD*
- c. *Periodical rest*
- d. *Running duty hours*

Q.59 What are the different type of running allowances payable to loco running staff.

Q 60 a) Write five safety items provided in an electric loco.

b) Write short note on 'Brake power certificate' and 'Caution Order'.

Question Bank for Quiz

(Electrical Engineering)

I) Power/Coaching

- Q.1 Illuminance is defined as _____
- Q.2 The unit for measuring illuminance is _____.
- Q.3 Full form of CFL is _____.
- Q.4 The diameter of T8 version of Fluorescent tube light is _____.
- Q.5 Wattage of T5 Fluorescent tube light is _____.
- Q.6 Life of T5 lamp is approximately _____ burning hours.
- Q.7 Full form of LED lamp is _____ lamp.
- Q.8 The platform lighting at railway station is divided in two circuits. Before arrival of train, _____ light is switched on.
- Q.9 DCP type of fire extingisher used for electrical fire.
- Q.10 Full form of ACSR conductor is _____.
- Q.11 The voltage and frequency of domestic power supply system in India is _____ and _____.
- Q.12 Average life of lead acid battery is _____ yrs.
- Q.13 Battery of _____ ampere hour capacity is used in AC 3tier coach.
- Q.14 Rating of alternator for BG AC coach is 18/25 KW.
- Q.15 The cut in speed for 4.5kw alternator used in Sleeper class coach is _____ kmph.
- Q.16 In sleeper class coach , _____ lux of illumination level is minimum needed.
- Q.17 Term "air-conditioning" was coined by _____ in 1906.
- Q.18 The EFT in coaches is provided for
- a. Controlling the DC supply
 - b. Feeding the battery
 - c. Extending power supply to/from the adjoining coaches
 - d. None of the above
- Q.19 Subject of Air conditioning of coaches on Indian Railways comes under the jurisdiction of
- a. CESE
 - b. CEGE
 - c. CELE
 - d. CEDE

- Q.20 Turbine pumps are used up to a suction head of
a. 1000 Ft. b. 100 Ft. c. 20 Ft. d. 50 Ft.
- Q.21 The yard stick for provision of Electrical points in staff quarters can be changed by the Zonal railways with the approval of
a. Railway Board b. EIG
c. General Manager d. CSO
- Q.22 The type of refrigerant used in LHB type of AC coaches is
a. R 12 b. F22 c. R 134a d.
none of the above
- Q.23. Who functions as Electrical Inspector to Government of India in Indian Railways?
(a) Chief Electrical Loco Engineer
(b) Chief Electrical Services Engineer
(c) Chief Electrical Engineer
(d) Chief Safety Officer
- Q.24 The human comfort level in an AC environment is effected by
a. Level of lighting b. Draft
c. Level of tiredness d. Speed of the train
- Q.25 The illumination is measured in term of
a. Tesla b. Candela/m²
c. Lux d. Gauss
- Q.26 The train lighting system used on EMUs is known as
a. Head on Generation System b. Self Generation System
c. End on Generation System d. Mid on Generation System
- Q.27 Railway station with annual passenger earnings from Rs. 3 to 6 Crs. are categorized as
a. A1 class b. C Class
c. B Class d. F class

Q. 28 The capacity of battery used in LHB Rajdhani coaches is

- a. 120 Ah
- b. 1100 Ah
- c. 90 Ah.
- d. 70 Ah

Q.29 In the months of rainy season what role can the air-conditioning system of conventional AC coaches perform?

- (a) It can increase the Relative humidity
- (b) It can decrease the Relative humidity
- (c) It can neither increase nor decrease the Relative humidity.
- (d) Relative humidity can both be increased and decreased from the setting of the control panel.

Q.30 The system of power supply used in the Coaches of Rajdhani & Shatabdi Express on IR is known as

- (a) Self Generation
- (b) End-on-Generation
- (c) Mid-on-Generation
- (d) Head-on- Generation

Q.31 A 3 tonne capacity AC will be able to remove heat @

- a. 2500 K Cal/Hr
- b. 5000 K Cal/Hr
- c. 9000 K Cal/Hr
- d. 6000 K Cal /Hr

Q 32 The numbers of AC Plants in an AC Ist Class coach (open type system) are:

- a. Three
- b. Two
- c. One
- d. Four

Q.33 The EIG draws his powers from

- a. The "Indian Electricity Act"
- b. The "Indian Electricity Rules"
- c. The "Indian Railways Act"
- d. The "Electricity Act, 2003"

Q.34 The frequency of domestic AC power supply adopted in India is

- a. 60 Hz.
- b. 50 Hz
- c. 75 Hz.
- d. 90 Hz.

Q.35 Train lighting on Indian Railways comes under the jurisdiction of

- a. CESE
- b. CEGE
- c. CELE
- d. CEDE

- Q.36 Both of the pump and motor are inside water in case of
- a. Turbine pump
 - b. Submersible pump
 - c. Centrifugal pump
 - d. Jet pumps
- Q.37 The Mid on Generation system of train lighting is used for
- a. Rajdhani Exp. Trains
 - b. MEMU trains
 - c. Slow passengers trains
 - d. Garibrath Exp. trains
- Q.38 Condenser is a part of
- a. RMPU
 - b. Cantilever Assembly
 - c. Arno Converter
 - d. Submersible Pump
- Q.39 Branch officer in division looking after maintenance of AC coaches in Division is known as ?
- a. Sr.DEE/M
 - b. Sr.DEE /P
 - c. Sr.DEE /G
 - d. Any of a,b,or c
- Q.40 To reduce Electrical energy bill , power factor should be kept
- a. as less as possible
 - b. as high as possible
 - c. power factor does not effect energy bill
 - d. as close to unity as possible
- Q.41 Railway station with annual passenger earnings from Rs. 3 to 6 Crs. are categorized as
- a. A1 class
 - b. C Class
 - c. B Class
 - d. F class

“You are working in Western Railway which comprises of Mumbai, Vadodara, Ahmedabad, Rajkot, Bhavnagar, and Ratlam divisions. While Mumbai Vadodara and Ratlam divisions are almost fully electrified, Rajkot and Bhavnagar Divisions have no electrification. Some portion of Ahmedabad divisions is electrified. There are 2 Electric loco sheds in Western Railway i.e. Vadodara and Valsad (in Bombay Division). There is a Makarpura TSS and conventional neutral section at LKD station between Makarpura and Bharuch. Makarpura to Bharuch is a flat section and maximum possible distance between the masts has been kept.”

Q.42 If you are posted as a branch officer in Rajkot Division for OHE related works, , you are likely to be known as

- | | |
|----------------|------------------|
| a. Sr.DEE/TRS | b. Sr.DEE (P) |
| c. Sr.DEE /TRO | d. either b or c |

Q.43 A section of ADI division has been electrified recently. Before energizing this section, whose sanction is essential

- | | |
|------------|-------------------|
| a. GM/WR | b. CEE/WR |
| c. DRM/ADI | d. Sr.DEE/TRD/ADI |

Q.44 Who is designated as EIG. in railways? -----

Q.45 The standard voltage adopted for 3phase AC system in India is

- a. 750 V AC b. 440 V AC c. 230 V AC d. 110V AC

Q. 46 Modified TL system is 2 wire unearthed system.

Q. 47 In RMPU type AC coach, 4 number of compressors are used.

Q.48 Capacity of inverter in RMPU AC coach is_____.

Q.49 Presently following type of AC coaches are used:

- | | |
|--------|---------|
| a. HOG | b. MOG |
| c. LHB | d. None |

Q. 50 A-9 auto valve is set to regulate brake pipe pressure in released condition at _____

II) TRD/RE

Q.1 Electrification in Indian Railways was introduced for the first time in the year _____.

Q.3 Average cost of electrification on double line section is around _____per route km.

Q.4 As per Vision -2020 plan of electrification, _____km are to be electrified every year till 2020.

Q.5 Minumum verticle distance between live OHE and fixed structure / moving loads is _____ for long duration.

- Q.6 Minimum lateral distance between live OHE and fixed structure /moving loads is _____ for long duration.
- Q.7 Minimum safe clearance for men to work near OHE is _____
- Q.8 N Type portals are used to cover OHEs of _____ number of tracks.
- Q.9 O Type portals are used to cover OHEs of _____ number of tracks.
- Q.10 R Type portals are used to cover OHEs of _____ number of tracks.
- Q.11 The standard height of contact wire above the track plane is kept as _____ at cantilever.
- Q.12 The height of OHE at level crossing gate is kept as minimum_____.
- Q.13 The stagger of OHE on tangent track is normally kept as_____.
- Q.14 The full form of UIOL is_____.
- Q.15 The Section insulator in OHE is provided for the purpose of_____.
- Q.16 The PTFE type neutral section is located on tangent track at least_____ after the stop signal.
- Q.17 The setting distance of mass on tangent track shall be normally _____for the broad gauge.
- Q.18 The normal setting distance of portal is kept as_____.
- Q.19 The maximum span in OHE is restricted to_____.
- Q.20 _____capacity Auxiliary transformers are provided at stations for supply power to signaling system.
- Q.21 The head quarter of CORE in Indian Railway is at_____.
- Q.22 The full form of CORE is_____.
- Q.23 The average yearly Railway Electrification planned under Vision 2020 is
a. 5000 RKM b. 1400 RKM c. 4500 RKM d. 2500 RKM
- Q.24 The horizontal distance between the Center Line of the Track and nearest face of the mast is known as
a. Stagger b. Implantation
c. Span d. Height

Q.25 The requirement of copper and steel is reduced in 25 KV single phase AC system as compared to DC system because of

- a. Lower voltage
- b. Lower current
- c. Lower power
- d. Lower energy

Q.26 O type portals are used for supporting OHE up to

- a. 4 tracks
- b. 6 tracks
- c. 8 tracks
- d. 3 tracks

Q.27 Overlap provided at an SSP is

- a. UIOL
- b. IOL
- c. Neutral section
- d. Section insulator with isolator

Q.28 What is the distance of warning boards from neutral section location:-

- a. 100 m & 500 m.
- b. 2000 m & 1000 m
- c. 500 m & 250 m
- d. 250 m & 150 m

Q. 29 Contact wire is placed in zig-zag manner in entire span length, in order to-

- (a) to avoid formation of groove on pantopan strip
- (b) to ensure uniform rubbing of pantopan strip within current collection strip
- (c) to avoid breakdown due to formation of groove in pantopan strip
- (d) all of the above

Q.30 All RE works on Indian Railways are centrally controlled by

- a. Zonal Railways
- b. Divisions
- c. CORE
- d. Production Units

Q.31 Bracket tube is a part of

- a. RMPU
- b. Cantilever Assembly
- c. Arno Converter
- d. Submersible Pump

Q.32 The stagger of contact wire at **push off** location is directed

- a. Towards the OHE structure
- b. Away from the OHE structure
- c. Right at the centre line of track
- d. None of the above

Q.33 The section insulator is used for

- a. Insulating the two phases in a TSS
- b. Insulating two elementary sections of OHE
- c. Insulating the OHE at insulated overlap
- d. None of the above

Q.34 The total Railway Electrification sanctioned in the 11th five year plan

- a. 5000 RKM
- b. 3500 RKM
- c. 4500 RKM
- d. 2500 RKM

Q.35 In an AC TSS, which phase of 132 KV/25 KV traction transformer should be earthed?

- a. one phase of 132 KV primary side
- b. both phases of 132 KV primary side
- c. one phase of 25 KV secondary side
- d. both phases of 25 KV secondary side

Q.36 The power supply between two adjacent Traction Substations feeding the OHE in TRD is separated by

- a. SP
- b. SSP
- c. FP
- d. RCC

Q.37 The horizontal distance between the Center Line of the Track and nearest face of the mast is known as

- a. Stagger
- b. Implantation
- c. Span
- d. Height

Q.38 Freight traffic hauled on electric traction on IR is

- a. 75%
- b. 67%
- c. 60%
- d. None of a,b,c

Q.39 Numbering of OHE structures on up line in a double line section will always be

- a. Even nos.
- b. In sequence
- c. Odd nos.
- d. none of the above

Q.40 Minimum height of contact wire on level crossings is

- a. 5.8 Mtr. b. 5.6 Mtr. c. 4.67 Mtr. d. 5.5 Mtr.

Q.41 Before charging any new electrified section on 25 kv AC, whose sanction is required.

- a. CRS b. ML c. GM d. CEE

Q.42 Before approaching neutral section, loco pilot is required to open DJ in loco to avoid _____ in OHE.

Q.43 First Electric train in India started on 3rd February _____.

Q.44 The horizontal distance between the Center Line of the Track and nearest face of the mast is known As _____.

- a. Stagger b. Implantation
c. Span d. Height

Q.45 Which of the following is a permissible span

- a. 62 m b. 49.5m c. 45.5m d. 35m

Q.46 To avoid formation of groove on panto, contact wire is held in a Zig Zag fashion. This arrangement is known as _____.

Q.47 Before approaching neutral section, loco pilot is required to open in loco to avoid _____ in OHE.

Q.48 While length of conventional neutral section is 41 mt, modern PTFE neutral section are only _____ mt long.

Q.49 Which of the following is a permissible OHE span

- a. 62 m b. 41 m c, 48 m d. 54m

Q.50 What is the distance of warning boards from neutral section location:-

- a. 100 m & 500 m. b. 2000 m & 1000 m
c. 500 m & 250 m d. 250 m & 150 M

Q.51 In general Traction Voltages on India Rly is.

- a. 1500 Volt b. 3000 Volt
c. 25000 Volt d. 750 Volt

Q.52 Indicate normal values of following

1. SPAN_____.
2. Setting Distance_____.
3. Encumbrance _____.

Q.53 What is the material used in Contact wire_____.

Q.54 Where is portal used?_____

Q.55 Regulating winding of auto transformer is provided with _____ taps.

- a) 6 b) 8 c) 16 d) 15 ()

Q.56 Define Elementary section of OHE_____

Q.57 In yards where adequate distance between tracks is not available, OHE is supported with the help of-

- a) Mast b) Upright c) Broom d) Portal?

Q.58 Electric supply in a sector of OHE is controlled by

- a) Isolator b) Interrupter c) Circuit Breaker d) Either b or c

Q.59 HOD looking after the maintenance of traction distribution is known as _____?

Q.60 In AC traction, span length varies in steps of :-

- a. 4.5 meters b. 9 meters
c. 6 meter d. 18 meters

Q.61 Maximum span length in AC traction is :-

- a. 67.5 meter b. 72 meter
c. 63 meter d. 22 meter

Q.62 Difference between two consecutive span length should not be more than:-

- a. 25 m. b. 20 m. c. 18 m. d. 16 m.

Q.63 Maximum wind pressure considered to design OHE structures for Red zone is:-

- a. 180 kgf /sq. m. b. 160 kgf /sq. m.
c. 150 kgf /sq. m. d. 110 kgf /sq. m.

Q.64 Maximum tension length in ac traction is:-

- a. 1500 m b. 1600 m c. 1000 m d. 750 m

- Q.65 At the end of tension length ,an overlap is provided :-
- to maintain electrical clearance.
 - to maintain mechanical clearance
 - to maintain mechanical & electrical clearance.
 - to provide smooth passage for pantograph.
- Q.66 A small tension length is much useful at the time of OHE breakdown or maintenance work due to:-
- mechanical independence of each tension length.
 - to maintain uniform tension in entire tension length.
 - easy transportation of OHE conductors.
 - all of the above
- Q.67 Which type of overlap is formed at the end of every tension length:-
- insulated overlap
 - un-insulated overlap
 - either Insulated overlap or un-insulated overlap.
 - none of the above.
- Q.68 Axial distance between catenary & contact wire at the OHE support , in vertical plane is called :-
- implantation
 - gradient of OHE
 - encumbrance
 - stagger
- Q.69 In AC traction ,normal encumbrance at support is:-
- 1.9 m
 - 1.4 m
 - 0.9 m
 - 2.0 m
- Q.70 In AC traction, height of contact wire at support from rail level (regulated OHE) with 100mm pre sag in contact wire is :-
- 5.5 m
 - 5.55 m
 - 5.6 m
 - 5.75 m
- Q.71 In AC traction, height of contact wire from rail level in Carshed is :-
- 5.6 m
 - 5.65 m
 - 5.75 m
 - 5.8 m
- Q.72 In AC traction, normal height of the catenary wire at support from rail level (regulated OHE) with 100 mm pre sag in contact wire is about :-
- 7 m
 - 7.75 m
 - 7.25 m
 - 7.45 m
- Q73 At level crossing gate, maximum height of rail height gauge from the road surface is
- 4.381 m
 - 4.67 m
 - 4.80 m
 - 4.45 m

- Q.74 At level crossing gate ,normal height of contact wire from the rail level is
 (a) 5.80. m (b) 4.67 m (c) 4.80 m (d) 5.50m
- Q.75 The fittings, which is used to transfer the weight of contact wire to the catenary wire is called:-
 (a) section insulator (b) Jumpers
 (c) cantilever assembly (d) droppers
- Q.76 Diameter of in-span dropper in ac traction is:-
 (a) 7 mm (b) 6.75 mm (c) 6 mm (d) 5 mm
- Q.77 Material of AC contact wire is :-
 (a) hard drawn copper (b) annealed copper
 (c) cadmium copper (d) brass
- Q.78 In AC traction, maximum stagger of contact wire on tangent track is :-
 (a) 380 mm (b) 300 mm (c) 229 mm (d) 200 mm
- Q.79 On tangent track, contact stagger is 200 mm at support, what will be the catenary stagger?
 (a) 300 mm. (b) 200 mm. (c) 100 mm. (d) Zero
- Q.80 In regulated OHE, how much tension is kept in OHE:-
 (a) as per tension / temperature chart (b) 3000 kg
 (c) 2000 kg (d) 1500 kg
- Q.81 In regulated OHE, Where anti-creep point is provided ?
 (a) starting of tension length (b) finishing of tension length
 (c) midway of tension length (d) all of the above
- Q.82 Tramway type OHE can be used for :-
 (a) main line (b) siding only
 (c) wiring of turnouts (d) all of the above
- Q.83 A neutral section is provided in OHE between two 25 KV , single phase, 50 Htz. traction sub-stations due to :-
 (a) to separate the zones, which fed by the adjacent sub station of different phase
 (b) to increases the current carrying capacity of the OHE
 (c) to minimise the voltage drop in OHE conductors
 (d) all of the above

Q.84 25 KV traction system needs the supply of :-

- (a) single phase
- (b) two phase
- (c) three phase
- (d) three phase & neutral wire

Q.85 In an AC TSS , which phase of 132 KV/25 KV traction transformer should be earthed ?

- (a) one phase of 132 KV primary side
- (b) both phases of 132 KV primary side
- (c) one phase of 25 KV secondary side
- (d) both phases of 25 KV secondary side

Q.86 Sub- Sectioning & parallel Post (SSP) are employed in OHE due to ?

- (a) to minimise voltage drop
- (b) OHE sectioning purpose
- (c) restrict tension length
- (d) all of the above

Q.87 The distance of OHE section between FP & SP is called :-

- (a) feeding length
- (b) feeding zone
- (c) sector
- (d) sub sector

Q.88 The shortest section of OHE, which can be isolated through remote control by TPC is called :-

- (a) elementary section
- (b) feeding zone
- (c) sector
- (d) sub sector

Q. 89 The shortest section of OHE, which can be isolated manually is called :-

- (a) elementary section
- (b) feeding zone
- (c) sector
- (d) sub sector

Q.90 Normally, bridging interrupters at SP are in :-

- (a) close position
- (b) open position
- (c) when traction load increased than closed bridging interrupter
- (d) when traction load decreased than closed bridging interrupter

Q. 91 In AC traction ,distance between two OHE's conductor ininsulated overlap is kept:

- (a) 500 mm.
- (b) 380 mm.
- (c) 300 mm.
- (d) 200 mm.

Q. 92 In AC traction , distance between two OHE's conductor in un- insulated overlap is kept:-

- (a) 375 mm.
- (b) 300 mm.
- (c) 150 mm.
- (d) 200 mm.

Q.93 Which type of neutral section, you prefer in heavily graded or suburban section?

- (a) overlap type
- (b) PTFE. Type neutral section
- (c) short neutral section comprising section insulator assembly
- (d) none of the above

Q.94 PTFE stands for :-

- (a) Plastic Tetra Floro Ethane
- (b) Poly Thermo Finials Ethane
- (c) Poly Tetra Floro Ethane
- (d) Poly Tetra Floro Ethylene

Q.95 In P.T.F.E. type neutral section assembly, Anti torsion droppers are used for:

- (a) good current collection at higher speed
- (b) to prevent oscillation of OHE
- (c) push up of contact wire very gradually
- (d) all of the above

Q.96 What is the distance of caution boards from neutral section location:-

- (a) 100 m.& 500 m.
- (b) 2000 m. & 1000 m.
- (c) 500 m. & 250 m.
- (d) 250 m. & 150 m.

Q.97 A device, which installed in contact wire to separate two elementary section & provide smooth passage for pantograph is called :-

- (a) insulated overlap
- (b) section insulator
- (c) bracket Assembly
- (d) cut-in insulator

Q.98 At the location of section insulator, stagger of contact wire should be:-

- (a) zero
- (b) 200 mm
- (c) 300 mm
- (d) 380 mm

Q.99 Which insulator is used in ac section insulator assembly:-

- (a) sectioning insulator
- (b) cut insulator
- (c) 9- ton insulator
- (d) stay tube insulator

Q.99 The arrangement of the cantilever assembly depends upon the :-

- (a) height of contact wire
- (b) setting distance
- (c) stagger
- (d) all of the above

Q.100 Which is not a part of the cantilever assembly ?

- (a) steady arm
- (b) adjuster sleeve
- (c) anti wind clamp
- (d) PG clamp.

Q.101 Why gap should be required between register arm tube & anti wind clamp strap:-

- (a) to avoid hard spot
- (b) to hold the register arm
- (c) to maintain proper height & stagger
- (d) to hold steady arm

Q.102 Minimum working clearance for 25 KV AC is :-

- (a) 500 mm
- (b) 1 m
- (c) 2 m
- (d) 3 m

Q.103 Normally, which type earth electrode is preferred for earthing in 25 KV AC Installations: -

- (a) plate type
- (b) pipe type
- (c) strip type
- (d) none of the above

Q.104 Minimum earth resistance when not specified should not be more than :-

- (a) 9 ohm
- (b) 10 ohm
- (c) 5 ohm
- (d) 2.5 ohm

Q.105 Minimum earth resistance for 25 KV TSS should not be more than :-

- (a) 5 ohm
- (b) 2 ohm
- (c) 1 ohm
- (d) 0.5 ohm

Q.106 Minimum earth resistance for 25 KV switching station (SSP / SP etc) should not be more than :-

- (a) 5 ohm
- (b) 2 ohm
- (c) 1 ohm
- (d) 0.5 ohm

Q.107 Lightning arrester prevents OHE from :-

- (a) surge & transient voltage
- (b) corrosion of -ve path conductor
- (c) back e.m.f.
- (d) all of the above

Q.108 The distance between centre line of the track to the nearest face of the structure is called:-

- (a) clear span
- (b) track separation
- (c) implantation
- (d) track clearance

Q.109 Implantation is also known as :-

- (a) skip distance
- (b) setting distance
- (c) clear span.
- (d) track separation

Q.110 What will be the "regulating ratio" of 3 pulley block system type ATD ?

- (a) 1:1
- (b) 2:1
- (c) 3:1
- (d) 5:1

Q.111 If SS wire of ATD broken, OHE does not come on ground due to :-

- (a) 9-ton insulator
- (b) fixed pulley
- (c) movable pulley
- (d) hex tie rod

Q.112 Current collection test is carried out during :-

- (a) before monsoon
- (b) during monsoon
- (c) after monsoon
- (d) night only

Q.113 What may be the reason of sparking during current collection test.

- (a) OHE is not proper
- (b) track is not proper
- (c) rolling stock is not proper
- (d) all of the above or either (a) or (b) or (c)

Q.114 In locally arranged power block ,supply of the siding or yard is shut down by :-

- (a) TPC
- (b) section controller
- (c) yard master
- (d) OHE incharge, who required power block

Q.115 TPC arranges emergency power block in which of following case/s?

- (a) a damaged OHE or feeder falling down and or persons or animals or vehicle or falling trees coming in contact with or likely to come in contact with live equipment
- (b) a damaged electric loco & driver requires the permit to work
- (c) derailment or any other accident on the electrified section
- (d) all of the above

Q.116 In the private no. book , private nos. are printed in the form of :-

- (a) two digits, serially
- (b) three digits, serially
- (c) two digits, not serially
- (d) three digits, not serially

Q.117 During power block , which type vehicles movement is blocked in power block section ?

- (a) electric hauled
- (b) diesel hauled
- (c) steam hauled
- (d) all of the above

Q.118 Before granting power block in the section , the longitudinal protection and lateral protection in the section is arranged by:-

- (a) TPC
- (b) section controller
- (c) TNL
- (d) station master

Q.119 If OHE breakdown or defect in OHE , which are likely to affect the train services noticed by any railway servant , will be reported immediately to :-

- (a) TPC
- (b) station master
- (c) section controller
- (d) either (a) or (b) or (c)

- Q.120 Cross section area of contact wire in AC OHE is_____.
- Q121 Diameter of dropper is _____mm.
- Q122 Spacing between droppers in span is 9 mts
- Q123 To pass ODC in electrified territory, clearance should be greater than 100mm.

III) LOCO/EMU-MEMU/Operation

- Q.1 The visibility of flasher light in electric locomotive is_____.
- Q.2 The maximum speed of fastest train hauled on electric section is 140 km in India.
- Q.3 WAP5 loco has designed power rating of _____ horsepower.
- Q.4 The latest loco being manufactured in Indian Railway is_____.
- Q.5 Electric locos in India are manufactured at_____.
- Q.6 Loco pilot is given headquarter rest for _____ for duty performed of more than 8 hours duration.
- Q.7 The out station rest to Loco pilot is given for _____for duty of more than 8 hours duration.
- Q.8 The running staff is entitled for _____ number of rest of 30 hrs. duration.
- Q.9 Specific Energy Consumption for goods train which around _____per 1000 GTKM
- Q. 10 Smoothing reactor (SL) is provided to :
- | | |
|----------------------------------|------------------------------------|
| (a) Convert AC to DC | (b) Increase undulation of current |
| (c) Reduce undulation of current | (d) Reduce OHE supply |
- Q. 11 ARNO converter is provided to convert :
- | | |
|---------------------------------|---------------------------------|
| (a) Three phase to single phase | (b) AC to DC |
| (b) DC to AC | (d) Single phase to three phase |
- Q. 12 WAG.5 loco are provided with:
- | | |
|-----------------------|----------------------------------|
| (a) DC series motor | (b) Single phase Induction motor |
| (c) DC compound motor | (d) None of the above |

Q.13 POH of Electric locos is carried out in

- | | |
|----------------|---------------|
| a. Trips sheds | b. Loco sheds |
| c. Depots | d. Workshops |

Q.14 POH of Electric locos is carried out in

- | | |
|----------------|---------------|
| a. Trips sheds | b. Loco sheds |
| c. Depots | d. Workshops |

Q.15 RDSO designed a new locomotive which will be known as YAP1 Bo-Bo. Each motor is capable of delivering power out put of 500 kw. Total weight of the loco is 80 tonnes.

1. What is the total power of the loco (delivered by all the motors put together) _____ kw?
2. What is the weight per axle _____ ?
3. For which gauge this loco is designed _____ ?

Q.16 Various types of Brakes provided in a locomotive could be

- 1.
- 2.
- 3.

Q.17 What is the principle of speed control in an electric locomotive? Please explain the process briefly.

Q.18 Write function of following equipments of electric loco in one line -

1. Rectifier
2. DJ
3. Pantograph

Q.19 What operations loco pilot requires to perform before entering a neutral section?

Q. 20 In a Bo-Bo-Bo type of locomotive, how many traction motors (axels). Will be there?

- | | | | | |
|------|------|------|------|-----|
| a) 2 | b) 3 | c) 4 | d) 6 | () |
|------|------|------|------|-----|

Q.21 What does MEMU stand for ?

- a) 220V _____.
- b) 50Hz _____ ()

Q.22 Electric loco is provided with 2 pantograph? Which one is normally used.

- a) Front b) Rear c) Any one of the two d) c or b

Q 23 First letter of classification indicates -----of loco.

Q 24 Two axle bogie with one traction motor for each axle is classified as -----

Q 25 WAG.5 loco is provided with -----bogie arrangement.

Q 26 WAP.5 loco is provided with -----bogie arrangement.

Q 27 WCG.2 loco can work under -----traction supply.

Q 28 There are ----- No. of maintenance sheds over IR for maintenance of electric locos.

Q 29 -----type Traction motor is used in WAP.4 locos.

Q 30 -----type Traction motor is used in WAP.5 locos.

Q 31 Electric loco draws power from OHE with the help of -----

Q 32 Electric Locomotive is provided with -----nos of pantograph.

Q 33 -----can be remote controlled from driving cab to disconnect OHE supply.

Q 34 High OHE voltage is stepped down with -----

Q 35 The voltage to traction motors can be controlled through -----.

Q 36 WAG.5 loco are provided with :

- (a) DC series motor (b) Single phase Induction motor (c)
DC compound motor, (d) None of the above.

Q 37 Smoothing reactor (SL) is provided to :

- (a) Convert AC to DC (b) Increase undulation of current
(c) Reduce undulation of current (d) reduce OHE supply.

Q 38 Auxiliary machines in locomotive work on:

- (a) Single phase ac supply (b) DC supply
(c) Three phase supply (d) All of them

Q 39 Traction Motors are mounted:

- (a) On loco roof, b) In under frame,(c) Inside Locomotive
(d) None of them.

- Q 40 Normally loco pilot uses :
- (a) Front pantograph
 - (b) Rear Pantograph,
 - (c) Both Pantograph
 - (d) None of them.
- Q 41 ARNO converter is provided to convert:
- (a) Three phase to single phase,
 - (b) AC to DC
 - (c) DC to AC
 - (d) Single phase to three phase.
- Q 42 Independent brakes are provided for:
- (a) Brake application in loco alone
 - (b) Brake application in train alone,
 - (c) Brake application in loco and train both
 - (d) None of them.
- Q 43 During dynamic braking :
- (a) Kinetic energy of loco is converted to Electrical Energy
 - (b) Electrical energy is converted to mechanical energy,
 - (c) Mechanical brakes are applied in loco
 - (d) None of them.
- Q 44 In regenerative braking:
- (a) Electrical energy produced is converted to heat energy,
 - (b) Electrical energy produce is fed to traction motor,
 - (c) Electrical energy produced is fed back to OHE
 - (d) None of above.
- Q 45 Supply in control circuit of loco is :
- (a) 380 Volt single phase,
 - (b) 380 Volt three phase,
 - (c) 110 Volt DC,
 - (d) 110 Volt AC.
- Q 46 The input supply to three phase traction motor is:
- (a) Fixed frequency variable voltage,
 - (b) Fixed voltage variable frequency,
 - (c) Variable voltage variable frequency,
 - (d) None of them.

True or False :

- Q 47 In DC locos all the traction motors are connected in parallel in starting
- Q 48 In AC locos, starting resistances are introduced to control the speed of Traction Motors.
- Q 49 WAP.4 locos are three phase locomotives.
- Q 50 WAG.9 locos are three phase locomotives.

- Q 51 Three phase traction motors are used in WAP.5 locos.
- Q 52 POH of electric loco motive is carried out at nominated electric loco work shop.
- Q 53 WAG.5 locos have Co-Co bogies.
- Q 54 Pantograph is mounted within the driving cab of the loco.
- Q 55 Mechanical Brakes in Locomotives are air brake only.
- Q 56 Silicon rectifiers reduce the undulation of current.
- Q 57 Transformer is used to step down OHE supply.
- Q 58 IGBTs are used to convert single phase to three phase supply.
- Q 59 Bo wheel arrangement indicate two axle bogie with two traction motors.
- Q 60 WAP.5 loco can work both in AC and DC sections..
- Q 61 ARNO converter converts AC supply to DC.
- Q 62 In locomotive, brakes are applied by destroying vacuum.
- Q 63 ARNO converters are being replaced by static converters.
- Q 64 Proportionate brakes in loco are applied with A9 brake valve.
- Q 65 DC series traction motors are provided in WAG.9 locomotives.
- Q 66 AOH of WAG.5 loco is carried out after 18 months.
