

INTEGRAL COACH FACTORY – CHENNAI – 38

Question Paper for selection of Assistant Electrical Engineer through Limited Departmental Competitive Examination

PAPER – II (Professional)

Date: 07.10.2017

Time: 3 hrs.
Max. Marks:150

PART – A

Answer any 10 question. Each answer carries 5 marks.

1. What are the factors which will have an impact on the specific energy consumption for EMUs and what is the improvement achieved in case of 3 phase EMUs?
2. Draw schematic diagram for ERRU & explain its working.
3. What are typical defects in VRLA batteries & what remedial measures are taken?
4. What are the energy conservation measures taken in ICF to reduce electrical energy consumption?
5. The details of the pumping requirement for ICF Railway colony are given below:

Estimated present consumption of water in 24 hrs:	
Average	25 lakh litres
Maximum	35 lakh litres
Total head	30 meters ✓
Pump efficiency	80%
Motor efficiency	85%

Calculate (i) WHP (ii) Input power in kW for the pump.
6. Explain how the temperature in individual areas is controlled in a chilled water system of air-conditioning.

7. Write Short notes on:
- Emergency light in coaches.
 - Permanent magnet Alternators.
8. Discuss Auxiliary power system adopted in 3 phase AC EMUs.
9. Write Short notes on:
- Dead-man's handle
 - DGA of transformer oil
10. What is adhesion? Explain detail the factors that affect adhesion in loco operation.
11. Which employee shall be deemed to have acquired working knowledge in Hindi as per Official Language policy? What incentives are offered for proficiency in Hindi?
12. With help of a neat schematics discuss the pneumatic system adopted in 3 phase AC EMUs.
13. Describe various Condition Monitoring procedures that you would follow to ensure the reliability of electric locomotives on line.
14. Describe (i) wheel slipping (ii) wheel skidding phenomenon experienced on electric locomotives. Mention the various preventive measures to be followed to avoid these conditions.

PART – B

Answer any 7 question. Each answer carries 10 marks.

- Calculate the capacity of central air-conditioning plant for an auditorium duly making and stating suitable assumptions.
- Describe the procedure for commissioning of EMUs equipped with 3 phase IGBT based electrics.
- Draw the schematic for power supply feeding arrangement for light, fans and air-conditioning equipments in the case of HOG compliant systems.

4. Draw the schematic 11kV power supply distribution arrangement duly indicating radial / ring mains in ICF / Shell and Furnishing separately.
5. What are the various protective arrangements available and safety measures adopted in the 11kV Substation / ICF
6. What are the salient features of Train 18 which is under production in ICF now.
7. Calculate the air-conditioning capacity required for a BG AC - 2 tier class coach duly making & stating suitable assumptions. Also indicate the capacity of various motors required for the system.
8. What are the distinct features of Train control and management system (TCMS) provided in 3 phase AC EMUs for Mumbai? Also indicate the issues, involved in the commissioning.
9. A 9-car EMU rake with a load of 540T, starts from Station 'A', accelerates at a rate of 0.4m/s^2 , till it reaches a speed of 72 kmph and coasts to a speed of 36 kmph. The motorman then applies brakes from 36kmph to bring the train to a stop at station 'B'. Average deceleration during coasting is 0.05m/s^2 and during braking it is 0.5m/s^2 .

Calculate – (i) the time taken for acceleration; (ii) the time taken during coasting; (iii) the time taken for braking; (iv) the distance between the two stations 'A' and 'B'; (v) Average speed for the journey.
10. a) What is the AOH of OHE. How is it different from POH.
b) Describe the special checks to be carried out in OHE at
 - i) Turns out
 - ii) Section insulator locations
 - iii) Insulator overlaps and uninsulated overlaps

PART – C

Answer any 3 question. Each answer carries 10 marks.

1. a) What are the various penalties covered under Minor Penalty category under D&A Rules. What is the time limit for finalizing a Minor Penalty charge sheet?
b) Define (i) Disciplinary Authority (ii) Enquiry officer (iii) Appellate Authority (iv) Revision Authority
- 2 Write short notes on:
 - i) Imprest Store
 - ii) ABC classification of items
 - iii) Local Purchase
 - iv) Stocking proposal
- 3 a) What is the definition of a factory under the factories act?
b) What are the prescribed hours of work for an adult worker as per the above act?
c) What are the criteria governing the payment of over time for an adult worker as per the Factories act?
4. a) What is the difference between August Review and Revised estimate?
b) Write short notes on:
 - i) Voted expenditure
 - ii) Consolidated fund of India
5. a) What innovative steps would you take to promote Rajbasha in your office and amongst staff?
b) What are three regions as per provisions made in the official language policy?