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. 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 in 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

	Fault sensing	Opening on load	Remote operational	section of OHE controlled
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'.

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