

Central Public Works Department
Departmental Examination for
Assistant Executive Engineer (E)
Electrical Engineering Paper - I
(Without Books)
December, 2017

Maximum Marks: 100

Time: 3 Hours

Note: Attempt any five questions. All questions carry equal marks.

2.5 X 8 = 20

1. Answer following: -

- a) Define Point wiring and Circuit wiring. What is the Group of Point wiring in case of Barrack?
- b) Whether the length of interconnection wires inside the switch box to be considered in case of measurements of Circuit / Submain wiring?
- c) Define twin control wiring. Whether recovery to be made for not providing another ceiling rose in this case?
- d) How much light points & connected load can be put on one lighting circuit?
- e) What is the minimum size for copper conductor cable to be used for Light wiring, Power wiring?
- f) What is the Degree of Ingress Protection and how is it specified? What is the relevance of IP in E&M service?
- g) How many copper conductor cables of 6 sqmm can be drawn in 32 mm steel conduit of straight run?
- h) Please prepare the sectional view with dimension for cable trench for laying of XLPE UG cable upto 1.1 KV and above 1.1 KV in two tier Horizontal formations.

2.5 X 8 = 20

2. Answer following: -

- (i) What is the LPD (Light Power Density) required for office building, as per Building Area Method?
- (ii) What is Luminous Efficacy and its unit? What is the Luminous Efficacy for LED Lighting System?

- (iii) What is the Colour Rendering Index (CRI)? Which type of Lamp is having maximum CRI?
- (iv) What percentage of total connected load of outdoor lighting system to be fed from Solar PV system?
- (v) What percentage of total energy requirement of the internal lighting and space lighting of a building to be fed from Renewable Energy Generation System?
- (vi) How much percentage of Annual Energy Requirements of water heating in a Residential facilities, Hotels, Hospitals to be met out from Renewable Energy based Water Heating System?
- (vii) What is brushless Alternator in DG set?
- (viii) What is the function of Automatic Voltage Regulator in DG set?

3. Answer following: -

4 X 5 = 20

- a) Explain Oil Type and Dry Type Transformers and its Application.
- b) Explain the Gas and Oil actuated (Buchholtz) Relay.
- c) What is the IP Rating for Indoor and Outdoor Transformer?
- d) What is the CT ratio for Incomer 11 KV HT panel suitable for 1000 KVA transformer? What is the Accuracy class for protection & metering CT in case of 11 KV Incomer HT panel?
- e) How many earthing electrodes required for 2X1000 KVA DG Set with LT panel board? please provide detailed breakup.

4. Answer following: -

20

- a) Explain the specific requirements under Accessible India Campaign for Lifts. 10
- b) Define RTT, Handling capacity, Waiting interval and its formulae. 5
- c) What is Machine Room Less Lifts? It's advantages / limitations over the Machine Room Lifts.

5

5. Answer following: -

20

- a) Explain the various components with schematic diagram of a Fire Fighting Pumping Station for a Multi-storey Building. 10

- b) What is the NPSH w.r.t. Pumps? 2
- c) What is the theoretical maximum suction head (M) under which a Centrifugal Pump can lift water? 2
- d) What is the difference between Horizontal and Vertical split casing pump? 2
- e) Which type of detector to be provided in Auditorium / Multiplexes? 2
- f) What is the height of false ceiling voids, above which sprinklers are required to be provided, as per NBC 2016? 2

6. Explain the following in HVAC system.

2.5 X 8 = 20

- a) VRV System
- b) Humidification and dehumidification
- c) Air cooled and water cooled chilling machine
- d) DX Type chilling machine
- e) Mechanical Ventilation in basement
- f) Air Change Rate required for Basement ventilation as per NBC 2016
- g) The Temperature Rating and Fire rating Hours in case of smoke exhaust fans for basement
- h) Dry bulb and wet bulb temperature