

Central Public Works Department
Departmental Examination for
Assistant Executive Engineer (E)
Electrical Engineering Paper - II
(With Books)
December, 2017

Time: 3 Hours

Maximum Marks: 100

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

1. Prepare conduit layout, wiring diagram and Bill of Quantity for providing Internal Electrical installations and Fans for a Type IV quarter, as per MoHUA Scale of Amenities for Electrical.
(Make your own assumptions, wherever required) 20
2. Answer following: -
 - a) Design a pressurisation Fan for staircase having 11 floors, as per NBC 2016. The doors are single panel of size 2.0 meter (H) X 1.2 meter (W). Overall efficiency for the Fan with Motor is 70%. Please provide the capacity (CMH), power rating, Rating temperature & Fire rating hours for the Fan. (Make your own assumptions, wherever required). 10
 - b) Design mechanical ventilation Fan system for basement having area 1000 sqmt and 3 meter height, as per NBC 2016. It should be designed in such a way that one fan works under normal ventilation condition and another one runs in case of fire or distress call. Please provide the capacity (CMH), power rating, Rating temperature & Fire rating hours for each of the Exhaust Fan. (Make your own assumptions, wherever required). 10
3. Work out the details of Fire safety arrangements required to be made for a Telephone Exchange Building having Gross area 1500 sqmt, 15 meter height, B+G+3, basement area 250 sqmt, as per NBC 2016. Please provide the preliminary cost estimate for the various E & M services for the same (except Internal EI and HVAC), as per PAR. (Make your own assumptions, wherever required) 20
4. Design a lift system for a Office Building, gross area per floor 1200 sqmt, 15 floors including ground floor, 3 meter floor height, 10 sqmt per person population. It should also be suitable for Physically challenged person. (Make your own assumptions, wherever required).

Please provide the following: -

- (i) Number of lifts
- (ii) Capacity of lifts
- (iii) Speed

- (iv) Clear opening door width of lift
- (v) Maximum gap between lift door and building floor
- (vi) Height of control panel inside the car
- (vii) Height of the hand rails and its location
- (viii) Illumination level inside the car

20

5. A Multi Story office building of 25,000 Sqm. Area, 20 meter height is centrally air-conditioned. For standby power supply DG Sets are to be installed in the first basement of the building. The client department has desired the entire load to be supplied by DG sets in the event of power failure.

Design, prepare scheme, single line diagram, specifications & BOQ in brief, for execution of DG set work in the building. (Make your own assumptions, wherever required). 20

6. In a large complex consisting of residential and non-residential various essential and non-essential power from Sub-Station to buildings is to be distributed through underground system. (Make your own assumptions, wherever required).

(i) Prepare a single line diagram of sub-station and power distribution to various building & utilities. 12

(ii) Select the number & size of 1.1 KV Grade, 3 1/2 XLPE aluminium cable for 100 amp load, 300 meter length. 4

(iii) Select the number & size of 11 KV Grade, 3 XLPE aluminium cable for 1000 KVA load, 350 MVA fault level for 1 sec. 4

Scale of Amenities- Electrical

S. No.	Description	Type / category of Accommodation						Type-VII & VIII	Servant Quarter
		Type-I	Type-II	Type-III	Type-IV & IV (Special)	Type-V	Type-VI		
1	Power Points (15 amp 6 pins)	2 in each Room 1 in kitchen 1 in Utility Area	2 in each Room 1 in kitchen 1 in Utility Area	2 in each Room 1 in kitchen 1 in Utility Area	2 in each Room 1 in kitchen 1 in Utility Area	3 in Drawing Room 3 in Dining Room 2 in each Bedroom 2 in kitchen 1 in Utility Area	3 in Drawing Room 3 in Dining Room 2 in each Bedroom 2 in kitchen 1 in Utility Area	2 in Office 4 in Drawing room 3 in Dining Room 2 in Family Lounge 2 in each Bedroom 2 in kitchen 1 in Utility Area	Total 2
2	Plug Points (5 amp)	Total 6 1 in each Room 1 in Kitchen 1 in Balcony	Total 8 1 in each Room 1 in Kitchen 1 in Balcony	Total 8 1 in each Room 1 in Kitchen 1 in Balcony	Total 12 1 in each Room 1 in Kitchen 1 Balcony	Total 15 1 in each Room 1 in Kitchen 1 in Store 1 in main Balcony	Total 17 1 in each Room 1 in Kitchen 1 in Store 1 in each Balcony	Total 22 1 in Office 1 in each Room 1 in Kitchen 1 in Store 1 in each Balcony	Total 2
3	Bracket Lights (with normal fittings excluding lamp /bulb)	Total 4 1 in each Room 1 in Kitchen 1 in each Toilet 1 in utility	Total 5 1 in each Room 1 in Kitchen 1 in each Toilet 1 in utility	Total 5 1 in each Room 1 in Kitchen 1 in each Toilet 1 in utility	Total 7 2 in each Room 1 in kitchen 1 in each Toilet 1 in utility	Total 8 1 in Store 1 in each Toilet 1 in utility	Total 9 1 in Store 1 in each Toilet 1 in utility	Total 12 1 in Store 1 in each Toilet 1 in utility	Total 3
4	Ceiling Fans	Total 3 1 in Living Room 1 in each Bedroom	Total 4 1 in Living Room 1 in each Bedroom	Total 4 2 in Living Room 1 in each Bedroom	Total 11 2 in Living Room 1 in Dining Room 1 in each Bedroom	Total 10 2 in drawing Room 1 in dining room 1 in each bedroom 1 in main Balcony	Total 12 2 in drawing Room 1 in dining room 1 in family lounge 1 in each Bedroom 1 in each Balcony	Total 12 2 in Drawing Room 1 in dining room 1 in family lounge 1 in each Bedroom 1 in each Balcony	Total 1
5	Call Bell points	Total 1 1	Total 3 1	Total 4 1	Total 6 2	Total 6 3	Total 12 3 (one with Image display system)	Total 14 4 (one with Image display system)	
6	Exhaust Fans	1 in each kit. & Bath & WC	1 in each kit. & Bath & WC	1 in each kit. & toilet/Bath /WC	1 in each kit. & toilet	1 in each kitchen & toilet	1 in each kitchen & toilet	1 in each kitchen & toilet	Total 2

UNIT DESIGN (TYPICAL) FOR TYPE-IV QRTS

(AS PER NEW NORMS)

