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BOARD DIPLOMA EXAMINATION, (C–16)

SEPTEMBER/OCTOBER - 2020

DEEE—FOURTH SEMESTER EXAMINATION

ELECTRICAL INSTALLATION AND ESTIMATION

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write the full forms of the following electrical devices :

(a) MCB

(b) MCCB

(c) RCCB

2. State the reasons for fire accidents in electrical system.

3. Write different types of fuses used in electrical installation.

4. Define service main and list different types of service mains.

5. Draw a single-line wiring diagram as per standard practice to be installed 2 Nos. AC machines in an electrical laboratory.

6. Determine the size of the cable for 15-HP, 415-V, 3-phase induction motor having an efficiency of 85% at a power factor of 0·85 lag.

7. State the need for earthing in electrical installation.

8. State the main components of overhead line of distribution.

9. What are the important tests to be conducted before energizing a domestic wiring installation?

10. State the IE Rule No. 31 related to placement of cut-out on consumer's premises.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* State the classification of electrical cables. 3

(b) Explain the procedure of first aid for shock treatment to an electrocuted person. 7

12. The plan of a residential building is shown in Fig. 1. It is to be provided with concealed system of wiring, the height of the building is 3·5 m. Estimate the quantity of materials required. Assume missing data, if any :

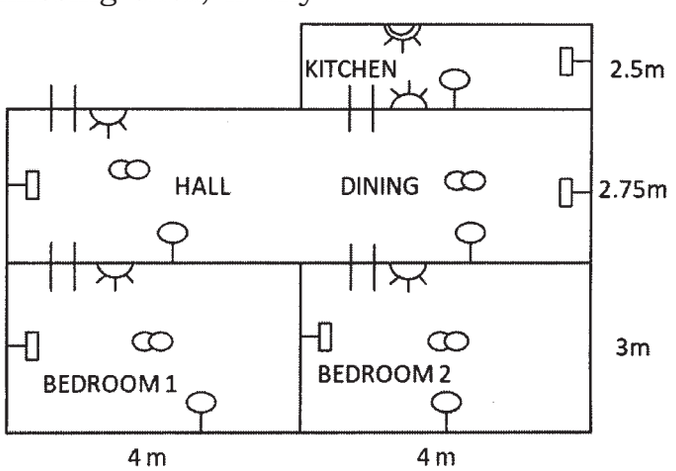

Fig. 1 : Plan of Building

13. The following electrical motors are to be installed in the electrical laboratory of the plan shown in Fig. 2. Make a neat single-line diagram of power wiring of electrical machines and prepare the list of materials required with cost. The height of the building is 3·5 m. Assume missing data, if any :

1. A 3-phase, 5-HP, 415-V induction motor
2. A 3-phase, 7·5-HP, 415-V induction motor

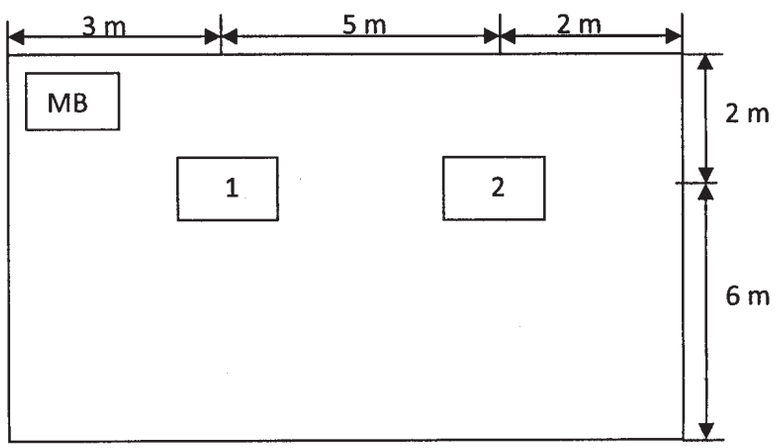

Fig. 2 : Plan of the Building

14. Prepare an estimate for electrifying the irrigation pump set installation and their appropriate cost of 5-HP, 3-phase, 400-V induction motor. The distance between LT pole and pump shed is 12 m. The pump shed dimension is 5 m × 3 m × 3 m. Assume missing data, if any.

15. Estimate the quantity of materials required for laying 3-phase, 5 wire distribution line for 1·5 km in a newly developed residential colony. Consider two 90-degree turns and assume span between the poles as 35 m.

16. Draw a neat sketch of 160 kVA, 11 kV/415 V, 3-phase, plinth mounted substation and estimate the materials required for the erection of substation.

17. Draw a neat sketch of plate earthing with dimensions suitable to 20 kW electrical laboratory load and estimate the quantity of materials required.

18. *(a)* Explain briefly the need of load survey in REC. 5

(b) A village has the following electrical loads and is to be electrified as per code of practice in NEC :

(i) 100 Nos. domestic load each of 600 W

(ii) 40 Nos. of agricultural pump sets of each 5-HP, 3-phase induction motors

(iii) 2 Nos. small-scale industries of each 7·5-HP

(iv) 2 Nos. temples each 2-kW load

Assume diversity factor 1·5, efficiency = 85%, power factor 0·8. Find the rating of distribution transformer as per NEC. Assume missing data, if any. 5

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