C20-EE–404

7447

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

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. Classify the cables according to voltage.

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

3. List various types of interior wiring systems.

4. Calculate the size of cable required for 7·5 HP, 400 V, 3-phase, 50 Hz squirrel cage induction motor. Assume efficiency of the motor as 85% and power factor as 0·8 lagging.

5. Draw the connection of service wire between LT pole and irrigation pump shed.

6. Classify the earthing along with applications.

7. Calculate the number of various insulators needed for the erection of 500 m, 3-phase, 11 kV overhead line with two-angle points and two turning points. The length of span is 70 m.

8. List any six main components of 11 kV overhead line.

www.manaresults.co.in

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

10. Write down the permissible earth resistance value for the following :

(a) 1 HP, 1-phase, 230 V, 50 Hz motor

(b) A 33/11 kV, 2 MVA sub-station

(c) 10 MW power generating plant

PART—B

8×5=40

Instructions : (1) Answer either *(a)* or *(b)* from each question.

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

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

11. *(a)* Explain the procedure of first aid to be adopted for shock treatment to an electrocuted person.

(OR)

(b) Explain TRS wiring system with neat sketch and mention their advantages and disadvantages.

12. *(a)* A 7·5 HP, 415 V, 3-phase, 50 Hz squirrel cage induction motor is to be installed in a workshop for which the plan is shown in figure below. Efficiency and power factors are 85% and 0·8 lagging. Draw the wiring diagram and estimate the quantity of materials required. Assume any missing data.
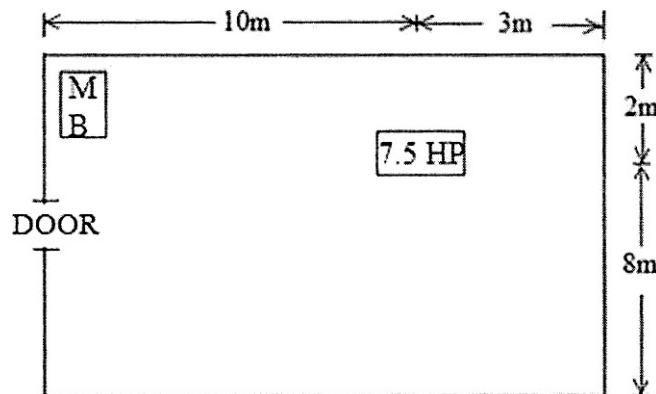

Fig. Plan of workshop

/7447   **2**   [*Contd...*

(OR)

(b) Draw the wiring layout for a workshop/electrical laboratory.

13. *(a)* Estimate the quantity of materials required for a surface conduit system of wiring in a house, whose plan is shown in figure. Consider wattage of lamps = 60 W, fans = 80 W, light socket = 100 W
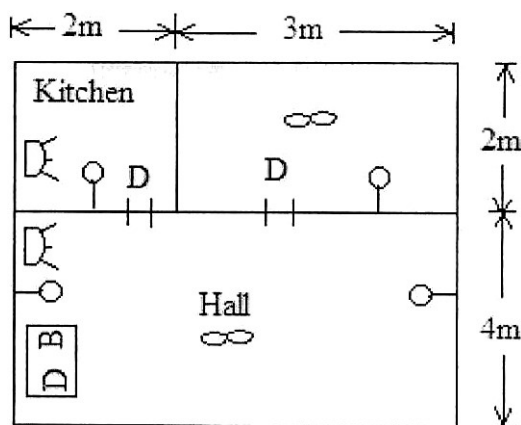

Fig. Plan of house

(OR)

(b) Draw a neat sketch of a submersible irrigation pump set of 7·5 kW, 3-phase, 415 V, 50 Hz motor positioned at a depth of 15 m in a tube well from the ground level. The distance between the nearest L.T pole and switch control room is 15 m and distance between switch control room and tube well is 3 m. The pump shed dimensions are 4 m × 3 m × 3 m. Efficiency and power factors are 85% and 0.8 lagging respectively. Estimate the quantity of materials required and draw the wiring diagram. Assume any missing data.

14. *(a)* Draw a neat sketch of 250 kVA, 11 kV/415 V, 50 Hz plinth mounted sub-station and estimate the quantity of materials required.

(OR)

(b) Draw a neat sketch of pipe earthing and list out the quantity of materials required.

15. *(a)* Explain the need for load survey in a rural electrification scheme.

www.manaresults.co.in

(b) Determine the voltage regulation of a 11 kV line with regulation constant 900, connecting from 33/11 kV substation. The loads connected to the line are shown in the figure. Assume diversity factor = 1·5 and power factor = 0·8 lagging.
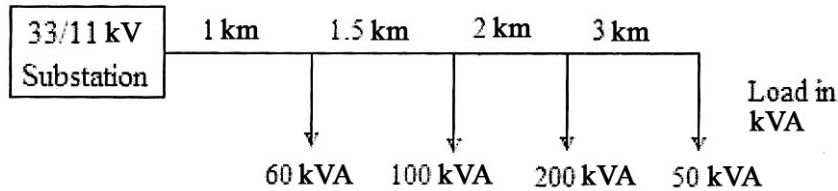

Fig. Load particulars of 11 kV line

PART—C   10×1=10

Instructions : (1) Answer the following question.

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

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

16. Estimate the quantity of materials required for a 11 kV overhead line of length 3 km. The height of pole is 10 m. ACSR conductor of size 7/2·11 mm is used. Assume two cut points and three 90° angle points and consider a span of 70 m.

★★★