6TH SEM./EME/ ELECTRICAL / 2022(S)

TH1 ELECTRICAL INSTALLATION AND ESTIMATING

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. Name any two types of methods of earthing.

   b. Write any two important properties of ACSR conductors used in transmission lines.

   c. State the Rule 31 of Cut-out premises in general safety precautions of Indian Electricity Rules.

   d. How Britannia straight joint is made between two bare wires?

   e. State any two accessories of conduit wiring system.

   f. Define (i) Depreciation factor (ii) Luminous flux in illumination.

   g. Name the material of filament and gas used in halogen lamp.

   h. Expand the abbreviation of ACSR, TPIC, TRS, and MCCB used in electrical estimation.

   i. What is the declared voltage and frequency of supply to consumer as per IE rules?

   j. Define(i)Black conduit (ii) Bird Guards

2. Answer **Any Six** Questions 6 x 5

   a. Explain about the installation of service line for low roof or single storeyed building briefly.

   b. Draw a neat labelled sketch diagram of plate earthing.

   c. Explain the construction and working of RCCB briefly.

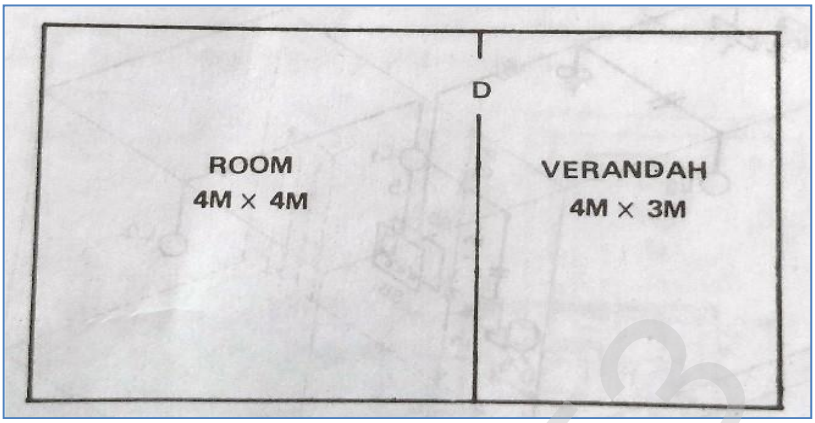
   d. Explain about the High Pressure Mercury discharge lamp briefly with a neat diagram.

   e. Describe the qualities and applications of PVC insulated wires.

   f. Write a short note on Steel towers used for supporting transmission lines.

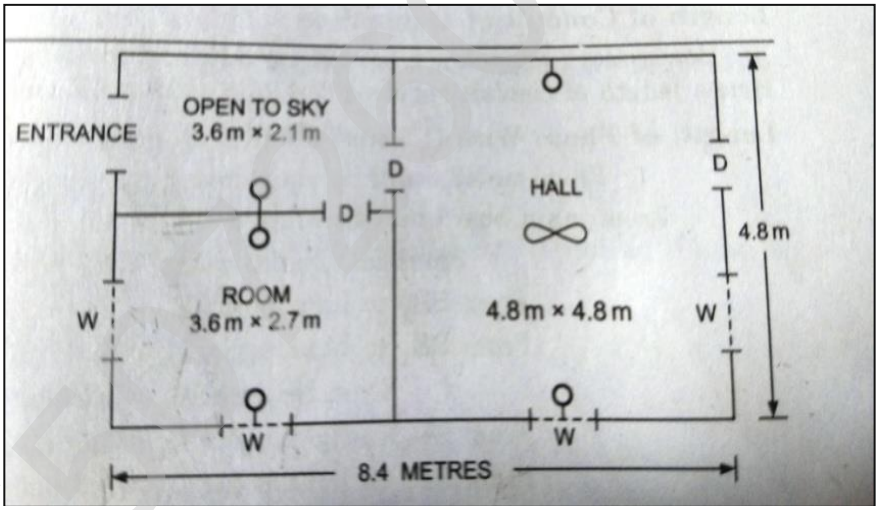
   g What are the differences between concealed conduit wiring and TRS wiring?

3 A room and a verandah, the plan of which is given below is required to be provided with electrical wiring. Mark the location of energy meter, main switch and switch board and electrical points suitably and draw the installation plan showing supply path to each point and wiring diagram. Calculate the total length of wire required for wiring the room and verandah in batten system of wiring. Assume: Total height of ceiling= 3.5 mts. Height of HR from floor=3.0 mts, Height of SB from floor=1.5 mt. Location of energy meter and main switch board =0.5 mt. inside verandah on room wall. 10



4 Explain the sequences to be followed in carrying out the estimate of domestic electrical installations (from drawing installation plan to preparing material table) in details. 10

5 Draw the electrical circuit and calculate the length of PVC Casing-Capping, phase & neutral wire for the wiring used in a house, the plan of which is given below. Assume the height of ceiling as 3.6 meters and one plug point is to be provided in each room. 10



6 In a city locality, an overhead distribution line of 400 volts, 3 phase, 50 cycles/sec is to be erected along a straight route on steel tubular poles. The length of the line is 500 meters and the line terminates at the end. Make a neat sketch of a tubular pole with 3-phase wires, earth wire, neutral wire and street light conductor, shackle insulators, reel insulator cable box, stay wire etc. and estimate the quantity of material required for installing the distribution line with full specification of each item. Size of ACSR conductors, for all types of wires, is 6/1x2.11 (squirrel conductor), Weight of ACSR conductor=85kg/km, Earth wire Galvanized steel is of 8 SWG, Weight of earth wire=10mts/kg, Line Sag=2% 10

7 There are four light/power sub circuits in an installation of a house wiring as follows: 10
No. 1 Sub-Circuit: Light points-2nos., Fans-2 nos., 5A Socket-4 nos.
No. 2 Sub-Circuit: Light points-5nos., Fans-2 nos., 5A Socket-2 nos.
No. 3 Sub-Circuit: Light points-2nos., Fans-3 nos., 5A Socket-3 nos.
No.4 Sub-Circuit: 15A Socket-1 no (1000W).
Assuming each fan is of 70W, each light is of 40W, each 5A socket is of 60W and supply voltage is 230V.Calculate the Total load in amperes assuming unity power factor. Also draw the single line diagram showing cut-out, energy meter, main switch board, and main distribution board.