

6TH SEM ./ ELECTRICAL/ELE & MECH / 2023(S)

TH1 ELECTRICAL INSTALLATION AND ESTIMATING

Full Marks: 80

Time- 3 Hrs

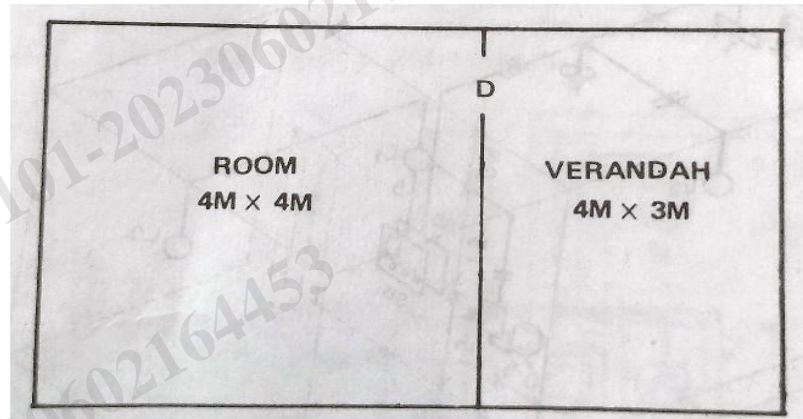
Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Define (i) Open Sparking (ii) Concentric Cable.
 - b. Write any two important properties of Glass Insulators used in transmission lines.
 - c. State the Rule 34 of Accessibility of bare conductor of Indian Electricity Rules.
 - d. How Pig tail joint is made between two solid conductors?
 - e. State any two advantages of PVC casing and capping wiring system.
 - f. Name any two types of methods of earthing.
 - g. What are the factors governing height of poles?
 - h. Expand the abbreviation of GI, TPIC, TRS, and RCCB used in electrical estimation.
 - i. What is the declared voltage and frequency of supply to consumer as per IE rules?
 - j. Define (i) Wire splicing (ii) Bird Guards

2. Answer **Any Six** Questions 6 x 5
 - a. Explain briefly about the different schemes of lightening.
 - b. Describe briefly about pipe earthing with a neat diagram.
 - c. Explain the construction and working of ELCB briefly.
 - d. Explain about the Sodium Vapour lamp briefly with a neat diagram.
 - e. Explain about the installation of service line for low roof or single storeyed building briefly.
 - f. Write a short note on shackle insulators in overhead lines with a neat diagram.
 - g. Describe about voltage grading and general specification of cables.

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. 10

Location of energy meter and main switch board =0.5 mt. inside verandah on room wall.



- 4 Describe about all types of lighting schemes with their advantages and applications in details. 10
- 5 Draw a labelled sketch diagram of pole mounted substation of capacity 50kva transformer of rating 11/0.4 KV, showing disc insulators, TPMO, fuse set, danger plate, stay wire, earthing clearly. 10
- 6 An overhead distribution line of 415volts,3phase,50Hz is to be erected along straight route.The length of the line is 300 meters and the end supports are terminal structures. 10
The span between adjacent poles is 50 meters.Draw a neat sketch of the terminal pole showing all the 3 phases, neutral, earth wire, street light wire. Phase wire-hard drawn bare copper wire no. 4 SWG. Neutral and street light wire- hard drawn bare copper wire no. 8 SWG. Earth wire-GS wire no. 8 SWG. Estimate the quantity of material required for the line.
- 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-2 nos.
No.4 Sub-Circuit: 15A Socket-2 no (1000W).
Assuming each fan is of 80W, 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.