

# CBCS SCHEME

094F24  
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USN

17EE553

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2023 Electrical Estimation and Costing

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Briefly explain the modes of tendering. (09 Marks)
- b. Explain the following terms : (06 Marks)
  - i) Contingencies   ii) Overhead charges   iii) Profit.
- c. State the purpose of IE rule and regulations. Explain IE rule 29, 30 and 55. (05 Marks)

OR

- 2 a. Explain purchase system. (10 Marks)
- b. State the rules to be observed while inviting tenders. (10 Marks)

### Module-2

- 3 a. Describe the various types of wires or cables usually used in internal wiring of buildings. (06 Marks)
- b. A lecture hall under construction, the plan of which is given in Fig Q3(b), is to be required in concealed conduit system of wiring suitable for 240volts single phase ac supply. The position of light point and fan points to be provided is indicated in the plan (light point L = 11 in number and fan point F = 8 in number). The ceiling height of the room is 6 meters. Draw the circuit diagram of the wiring indicating the position of distribution boards and estimate the quantity of various materials required for the wiring

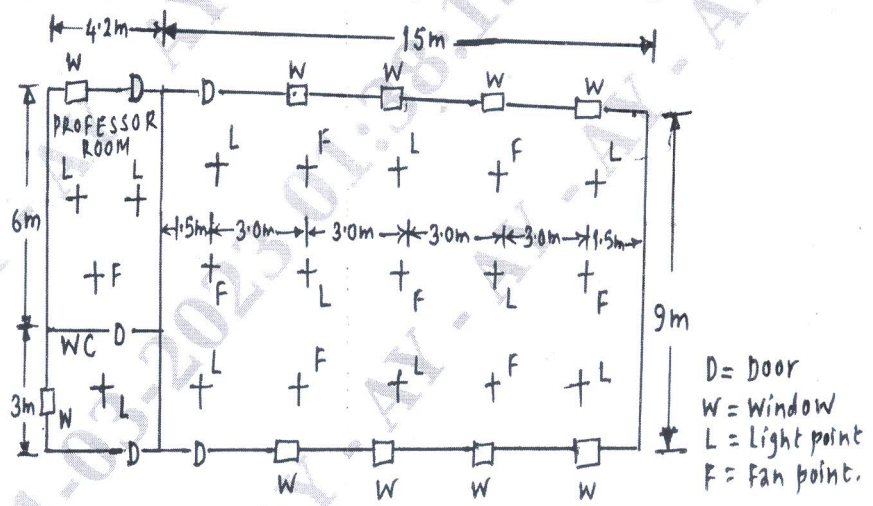


Fig Q3(b)

(14 Marks)

OR

- 4 a. With reference to internal electrification of building, explain how to determine the following: i) total load ii) rating of main switch and distribution board iii) number of circuits. (06 Marks)
- b. Explain the points on which the choice of wiring system can be made. (06 Marks)
- c. Determine the size of cable required to carry the maximum current of 50amps. It is given that length of cable is 500 meters and allowable voltage drop is 5% of declared supply voltage. Declared voltage is i) 400 volts dc ii) 400 volts ac. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**Module-3**

- 5 a. A farmer requires to connect a 3-phase 37kW, 415V, 50Hz motor to a 3-phase, 4-wire, 415/240V, 50Hz over head line. The distance of the service line from the farmer structure having motor is 15m. The motor has an efficiency of 85% and a power factor of 0.8. Estimate the quantity and cost of material required. (08 Marks)
- b. Explain how to determine the following for the purpose of wiring : i) input power to motor ii) input current to motor iii) Size of cable iv) rating of fuse. (08 Marks)
- c. List any eight important considerations regarding motor installation. (04 Marks)

**OR**

- 6 a. A 10hp, 415V, 3-phase 50Hz induction motor is to be installed in a work shop, the plan of which is shown in Fig Q6(a). Show the layout of wiring and estimate the quantity of material required. The wiring is to be surface conduct.

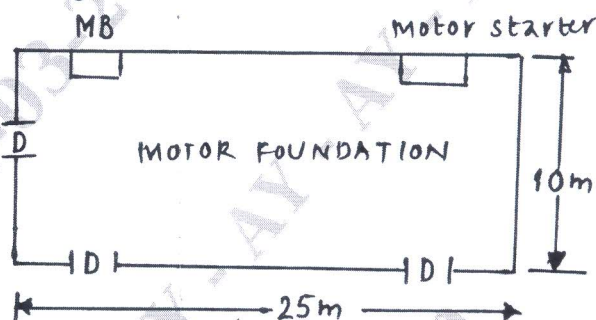


Fig Q6(a)

- b. Write a short note on service lines. (04 Marks)
- c. What are the different types of service connection? List advantages and disadvantages. (08 Marks)

**Module-4**

- 7 a. Explain the functions of the following relevance to over head transmission and distribution.  
i) Phase plates ii) beads of jumpers iii) bird guards iv) muffs. (08 Marks)
- b. Estimate the cost of adding 132kV bay at 132kV grid substation. (12 Marks)

**OR**

- 8 a. What are main requirement of the line supports? Describe factors governing height of pole. (08 Marks)
- b. A pole for an 11kV, 3phase, 50Hz overhead line is situated on the bank of the road where there is no front and back for fixing the stay in the ground. This pole is to be earthed and a stay is to be provided. Prepare the list of material required. (12 Marks)

**Module-5**

- 9 a. Explain the classification of substation. (08 Marks)
- b. Estimate the quantity of material required for the augmentation of 33kV grid substation of 500KVA to 1000KVA, 33/11kV grid substation. (12 Marks)

**OR**

- 10 a. Write short notes on substation auxiliary supply. (08 Marks)
- b. Estimate the quantity of material required cost of installation of 132/33kV substation with main and transfer bus scheme having  $2 \times 40$ MVA transformers. (12 Marks)

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