

# CBCS SCHEME

17EE553

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## Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Electrical Estimation and Costing

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Define estimating and state its purpose. State the important facts which an estimator should know for preparing an internal wiring estimate. (08 Marks)
- b. Explain the following : (i) Catalogues (ii) Purchase system (iii) Contingencies. (06 Marks)
- c. Mention the different mode of tendering and explain them. (06 Marks)

OR

- 2 a. State the purpose of IE rule and regulations. Explain IE rules 29,30 and 55. (08 Marks)
- b. Write note on the comparative statement. (06 Marks)
- c. Explain (i) Overhead charges (ii) Profit (iii) Payment of bills. (06 Marks)

### Module-2

- 3 a. List the general rules guidelines for residential installation. (04 Marks)
- b. Explain the different systems of distribution of energy in a building. (04 Marks)
- c. Draw the electrical circuit and estimate the quantity of material required for the wiring system. Chosen in a house plan shown in Fig. Q3 (c). The height of ceiling as 3.6 m and one plug point (60 W) has to be provided in each room. (12 Marks)

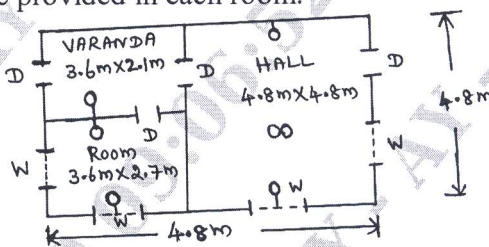


Fig. Q3 (c)

OR

- 4 a. Explain the points on which the choice of wiring system can be made. Why fuse is connected in the phase wire? (08 Marks)
- b. 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)
- c. Determine the size of conductor (copper) for a 2-core cable required to carry a maximum current of 60 A. Length of the cable used is 60 m and declared supply voltage is 240 V AC. (Current ratings of cables shown in table Q4 (c) may be referred) (06 Marks)

Size of cable		Current rating in Amps		Approximate Ampere-meter per volt drop
No. and dia of wire	Area in mm <sup>2</sup>	2 Core cable	3 or 4 core cable	
19 / 1.12	19.35	62	50	1050
19 / 1.32	25.80	74	59	1475
19 / 1.626	38.70	97	78	2200

Table Q4 (c)

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. State the important considerations regarding motor installation wiring. (06 Marks)  
 b. Explain the determination of input power, size of conduit, distribution board, main switch, starter size of the cable and rating of the fuse. (08 Marks)  
 c. Prepare an estimation of materials for providing OH service connection to a single storied building with 240 V, 1 $\phi$ , 50 Hz AC supply. The building has a light and fan load of 5 kW. The supply is to be given from an OH line 20 m away from the building. (assume missing data). (06 Marks)

OR

- 6 a. What do you understand by service line? Write down the various methods of installing service lines. (04 Marks)  
 b. With simple sketches, explain any two methods of installation of OH service lines based on the prevailing conditions of the building. (06 Marks)  
 c. A 10 HP, 415 V, 3  $\phi$ , 50 Hz induction motor is to be installed in a workshop the plan of which is shown in Fig. Q6 (c). Show the single line diagram and estimate the quantity of material required. (10 Marks)

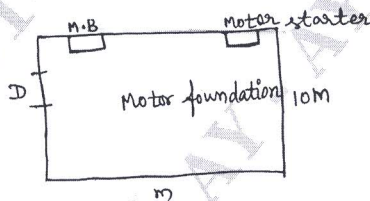


Fig. Q6 (c)

Module-4

- 7 a. List out the various points to be considered at the time of erection of over head lines. (06 Marks)  
 b. Explain the following : (i) Cross arms (ii) Guys and stays (iii) Lightning arrestor. (06 Marks)  
 c. Explain the necessity of earthing of transmission line supports and also show with a neat sketch how earthing of a line support is done using pipe earthing. (08 Marks)

OR

- 8 a. Explain what is meant by repairing and jointing of overhead ACSR transmission conductors. How repairing or jointing is done? (06 Marks)  
 b. Explain the functions of the following in relevance to OH transmission and distribution : (i) Phase plates (ii) Beads of jumpers. (06 Marks)  
 c. A pole for an overhead 11 KV, 3 $\phi$ , 50 Hz line is required to be earthed and a stay is to be provided make a neat sketch, how it should be done. Prepare a list of materials required. (08 Marks)

Module-5

- 9 a. Describe briefly the equipment that must be available in a substation. (05 Marks)  
 b. Write short notes on substation auxiliary supply. (05 Marks)  
 c. Prepare a list of material required for the installation of a 400 KVA indoor type 11/0.433 KV transformer. (10 Marks)

OR

- 10 a. Explain the functions of the following in a substation : (i) Isolators (ii) Earthing switch (iii) Batteries. (06 Marks)  
 b. Draw the single line diagram for 132/33 KV substation with main and transfer bus having 2 $\times$ 40 MVA transformers. Prepare an estimation of materials required, with their complete specification. (08 Marks)  
 c. Explain the purposes of substation earthing system. (06 Marks)

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