

CBCS SCHEME

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15EE553

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Electrical Estimation and Costing

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define estimating and explain the purpose of estimating and costing. (05 Marks)
- b. Explain the following : i) payment of bills ii) contingencies iii) purchase order. (06 Marks)
- c. State the purpose of IE rule and regulations. Explain IE rules 29, 30 and 55. (05 Marks)

OR

- 2 a. Explain purchase system. (09 Marks)
- b. What is a tender form? Explain various modes of tendering. (07 Marks)

Module-2

- 3 a. Explain the different systems of distribution of energy in a building. (05 Marks)
- b. Explain the points on which the choice of wiring system can be made. (05 Marks)
- c. Determine the size of the copper conductor for a 2-core cable required to carry a maximum current of 60A. Length of the cable used is 100 meters and declared supply voltage is 240V ac. [current ratings of cables shown in Table.Q3(c) may be referred]. (06 Marks)

Size of cable		Current rating in Amps		Approximate Ampere –meter per volt drop
No. and die of wire	Area in mm ²	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 Q3(c)

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 three essential points which must be considered while determining the size of the conductor for internal wiring for a given circuit. (06 Marks)
- c. A residential building is to be provided with electrical installation to be connected to a single phase, 240V, 50Hz AC supply. Details of the electrical points to be installed in the building are as follows :
Lighting circuit : light points – 8 nos. 5A socket outlets – 7nos.
Heating circuit : 15A socket outlets – 2 nos. (1 for kit, 1 for both room).
Determine : i) total number of sub-circuits ii) rating of distribution board iii) size of cable for lighting circuit iv) size of cable for heating circuit. (04 Marks)

Module-3

- 5 a. What do you understand by 'Service Line'? What are the types of service connections that are in use? Compare the different types of service connections. (05 Marks)
- b. Prepare an estimation of materials for providing OH service connection to a single storied building with 240V, 1 ϕ , 50Hz AC supply. The building has a light and Fan load of 5 KW. The supply is to be given from an overhead line 20m away from the building. [Assume missing data]. (06 Marks)
- c. State the important considerations regarding motor installation wiring. (05 Marks)

OR

- 6 a. With simple sketches, explain any two methods of installation of overhead service lines based on the prevailing conditions of the building. (04 Marks)
- b. Explain how to determine the following for the purpose of wiring: i) input power to a motor ii) input current to motors iii) size of the cable iv) rating of the fuse. (08 Marks)
- c. A 10 HP(metric), 415V, 3 – phase, 50 Hz induction motor is to be installed at the middle of a 30m \times 10m workshop. The motor has been supplied along with STAR/DELTA starter. The meter – board shall be located at one corner of the workshop. Draw :
i) The plan of the workshop showing positions of the equipments
ii) The layout of the wiring. The wiring is to be of surface conduit type. (04 Marks)

Module-4

- 7 a. Explain the functions of the following in relevance to OH transmission and distribution.
i) phase plates ii) beads of jumpers. (04 Marks)
- b. 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)
- c. A 1 km long overhead distribution line of 415V, 3 phase, 50 Hz is to be erected along a straight route from a 100KVA, 11/0.433 – 0.240 KV pole mounted sub-station. The line is to be laid with 6/1 \times 3.00mm ACSR conductor on RCC poles of 9m length. The span between adjacent poles is to be maintained at 50m. Draw a rough sketch of the route and find : i) the number of poles required ii) the total length of the ACSR conductor required iii) the length of the 8 SWG GI wire for earthing. (04 Marks)

OR

- 8 a. Explain what is meant by 'repairing' and jointing of overhead ACSR transmission conductors'. How repairing or jointing is done? (04 Marks)
- b. List out the various points to be considered at the time of erection of overhead lines. (08 Marks)
- c. An overhead distribution line of 415V, 3 phase, 50Hz is to be erected along a straight route. The length of the line is 300 meters and the end supports are terminal structures. The span between adjacent Poles is 50 meters. Consider 4 SWG bare copper wires for phase, neutral and street light control; 8 SWG galvanized steel wire for earth wire. Find the :
i) number of intermediate poles and the number of terminal structures ii) length of wire of each size for the line. (04 Marks)

Module-5

- 9 a. Explain the requirement of the following in a substation :
i) substation auxiliaries supply ii) substation earthing. (08 Marks)
- b. Draw the single line diagram for a 10MVA, 33/11KV substation and prepare an estimation of materials required, with their complete specification. (08 Marks)

OR

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