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10EE81

Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Electrical Design Estimating and Costing

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, selecting
at least TWO questions from each part.**
2. Assume suitable data wherever necessary.

PART – A

- 1
 - a. Define estimating and state its purpose. (06 Marks)
 - b. Describe the important factors which an estimator should know for preparing an internal wiring estimation. (08 Marks)
 - c. Explain how is the quantity of materials required for internal wiring determined. (06 Marks)
- 2
 - a. Mention any twelve general rules required to be followed for internal wiring. (06 Marks)
 - b. Estimate the quantity of materials required for wiring a newly constructed residential building, the plan of which is as shown in Fig.Q.2(b). Assume the details of load. All dimensions are in metres. (14 Marks)

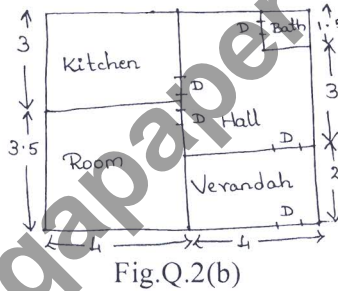


Fig.Q.2(b)

- 3
 - a. Explain how costing of electrical wiring installation is chosen for commercial buildings. (04 Marks)
 - b. The plan of a ground floor of a three storeyed hostel building in a polytechnic is shown in Fig.Q.3(b). The number of lights and fans to be installed are also indicated. The first and second floors are similar in plan. In each room one no. 5A socket outlet has to be provided. Prepare an estimate for the quantity of materials only for deciding the cable size and also determine the number of sub-circuits in each floor. (16 Marks)

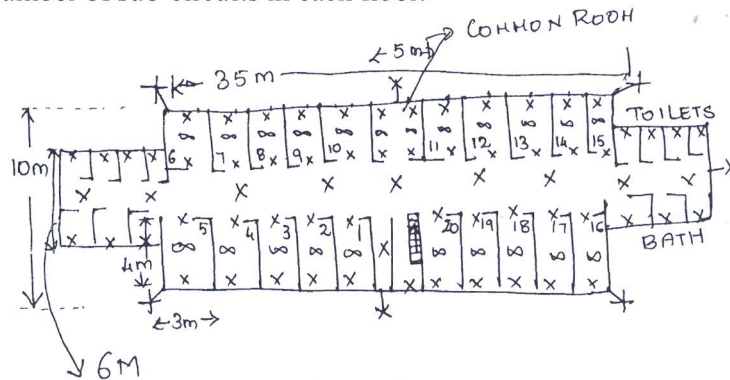


Fig.Q.3(b)

- 4 a. What are the factors to be checked while inspection of internal wiring installations? (06 Marks)
- b. Mention the reasons for excess recording of energy consumption by energy meter. (06 Marks)
- c. A farmer requires to connect a 3-phase, 37 kW, 415V, 50Hz motor to a 3-phase, 4-wire, 415, 50Hz overhead line. The distance of the service line from the farmer structure having motor is 15m. (08 Marks)

PART – B

- 5 a. Mention any ten considerations regarding motor installation wiring. Also explain how rating of fuses are determined. (08 Marks)
- b. Estimate the quantity of materials required for an agricultural pump set of 5.0 kW, 3 phase, 415V motor. The layout of pump shed is as shown in Fig.Q.5(b). (12 Marks)

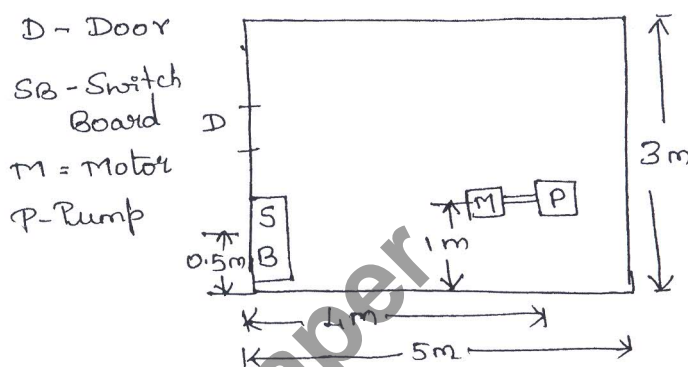


Fig.Q.5(b)

- 6 a. Explain with a block diagram how electrical energy is conveyed in a typical AC electrical power supply system. (08 Marks)
- b. A pole for an overhead 11kV, 3-phase, 50Hz line is required to be earthed and a stay is to be provided. Make a neat sketch showing how it should be done. Prepare a list of materials required. (12 Marks)
- 7 a. What are the various types of insulators used in construction of distribution over head lines? (08 Marks)
- b. A 1km long overhead distribution line of 415 volts, 3-phase, 50Hz is to be erected along a straight route from 100kVA, 11/0.433 kV pole-mounting substation. The line is to be laid with $6/1 \times 3.00\text{mm}$ ACSR conductor on RCC poles of a metre length. Make a list of material required for the line the span between adjacent poles is 50 metres. (12 Marks)
- 8 a. What are the advantages and disadvantages of outdoor substation over indoor substations? (08 Marks)
- b. Estimate the quantity of material for erection of a 250KVA pole-mounted substation. (12 Marks)
