Eighth Semester B.E. Degree Examination, June/July 2016
Electrical Design, Estimation and Costing

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a. Define estimating and state its purpose. State the important factors which an estimator should know for preparing an internal wiring estimate. **(08 Marks)**
    b. Explain : (i) Contingencies (ii) Overhead charges and (iii) Profit. **(06 Marks)**
    c. Mention the different modes of tendering and explain them. **(06 Marks)**

2   a. Explain the sequence to be followed for preparing the estimate of residential wiring. **(06 Marks)**
    b. The accompanying sketch shows the plan of an officer's quarter. Its to be wired up as an AEH installation. The heating load is two outlets of 1kW each in the kitchen and one outlet of 2kW in the bath. The existing supply pole is 20 mtrs away from the house. Use conduit wiring system for the calculations.
       i)   Mention the type of service mains proposed
       ii) Show the wiring plan in the sketch supplied
       iii) Calculate the total load consumption
       iv) Calculate the length of the wire
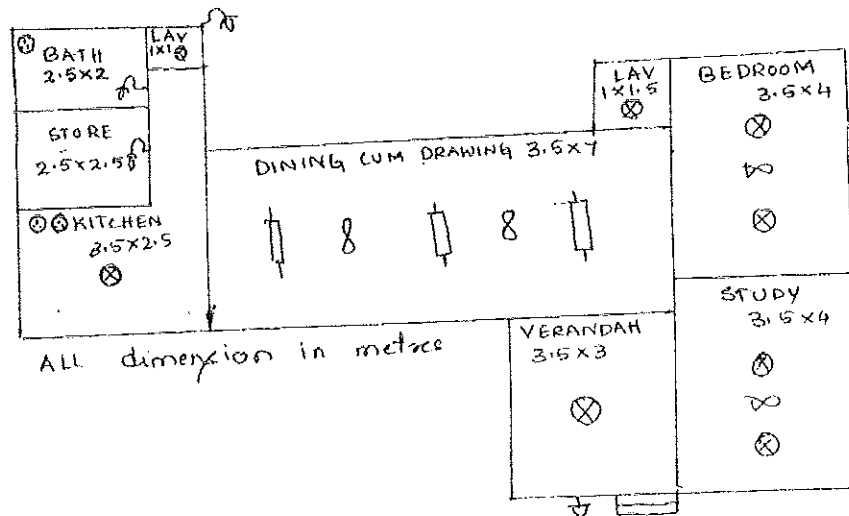   v)   Calculate the length of conduit required. **(14 Marks)**

Fig. Q2 (b)

3   a. What is bus bar? Draw the diagram showing the arrangement of bus bar and switch fuse unit in a bus bar chamber. **(04 Marks)**
    b. An office hall 30m × 15m × 3m is to be illuminated by 40 nos twin 40 watts tube light fitting. Number of lamp fitted along the width and length are 4 and 10 respectively. Single phase 230V, 50Hz a.c supply is available at the centre of one of the 30m long wall. Assuming PVC conduit type of wiring calculate (i) Total connected load (ii) Number of sub-circuits (iii) Size of cable.   iv) Ratings of switch board and Distribution board (v) Also show the wiring diagram of 1 sub-circuit. **(16 Marks)**
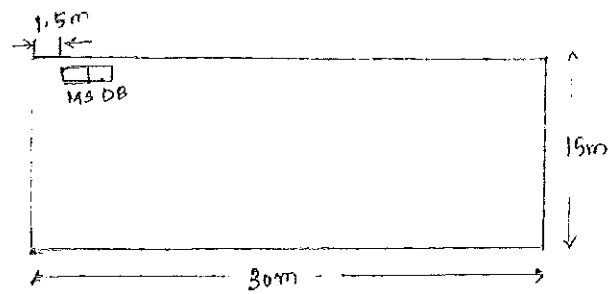
Fig. Q3(b)

4 a. Name the various tests required to be performed before connecting new installation to supply. Explain how is the polarity tested. **(07 Marks)**

   b. What are the methods of installation of service lines? Mention the various methods used for the installation of overhead lines. **(06 Marks)**

   c. A single storeyed house is to be provided with service connection from nearby pole situated 20 meters away from building receiving point. The supply is given at 1ϕ, 230V, 50Hz. Prepare list of material with specification. Assume total load connected in the house is 3200W. **(07 Marks)**

PART – B

5 a. Explain the determination of input power, size of conduit, distribution board, main switch and starter. **(06 Marks)**

   b. Two ac, 3phase, 415V, 50Hz squirrel cage motors are to be installed in a workshop. The rated outputs of the motors and their locations are as shown in the Fig. Q5(b) γ - Δ starters supplied with each motor are to be installed on the wall. The supply company's meter will be located at the position marked. The wiring of the machine is to be carried out according to IE rules. Make a neat sketch of the wiring scheme with the help of a single line diagram indicating on the wiring diagram the number and size of cables used. Prepare a list of material required for the wiring including the necessary earthings.
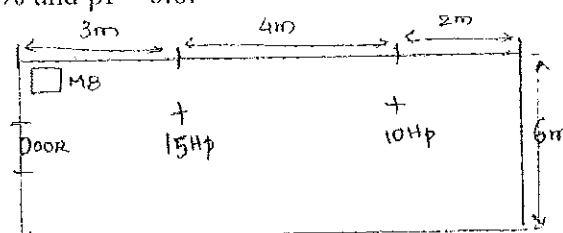Assuming efficiency 85% and pf = 0.8. **(14 Marks)**

Fig. Q5(b)

6 a. Define feeder, distributor and service mains. **(06 Marks)**

   b. Estimate the quantity's of material required and cost of 1km of overhead 11kV 50Hz line using steel pole of 11meter height and ACSR conductor of 6/1 × 2.59 mm with an average span of 120m. **(14 Marks)**

7 a. Explain the procedure for the estimation of H.T lines for the distribution line. **(08 Marks)**

   b. Estimate the cost of LT lines extension from T.C to 3I.P sheds of 5Hp each at a distance of 500m from TC. Assume a span of 65M and 7.5M poles. **(12 Marks)**

8 a. What is the purpose of providing the substation earthings systems? **(04 Marks)**

   b. Estimate the quantity of material required for the augmentation of 33kV grid substation of 500KVA to 1000KVA, 33/11kV grid substation. **(16 Marks)**

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