

**DIPLOMA IN ELECTRICAL AND
MECHANICAL ENGINEERING**

Term-End Examination

December, 2011

**BET-038 : ESTIMATING AND QUANTITY
SURVEYING**

Time : 2 hours

Maximum Marks : 70

Note : *All questions of Section 'A' are compulsory. Attempt any TWO questions from Section 'B' and any TWO questions from Section 'C'. Use of CALCULATOR is PERMITTED.*

SECTION - A

1. State 'TRUE' or 'FALSE' for the statements below :

- (a) Lighting domestic load of a normal house is generally a 'Single - Phase' system. **1x8=8**
- (b) Rate analysis of any work like concreting involves supervision charges, overhead charges, contractors profits
- (c) ACSR conduction have steel reinforcements.
- (d) Purpose of an estimate is to determine quantities, activities and resources and their cost.
- (e) External plastering of a building is also called 'Rendering.'

- (f) 'Earth Electrode' is a term used in earthing.
- (g) 'Average cross-sectional Area' method is used for calculation of earthwork in long trenches.
- (h) Cost of earthwork also needs to be calculated and estimated for laying of pipes and cables in the ground.

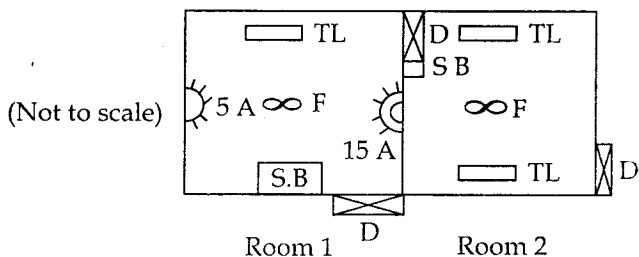
2. Write short note on any **THREE** of the following :

- (a) Slump Test. 2x3=6
- (b) MES SSR Part II
- (c) Purpose of Earthing
- (d) MCB
- (e) Rate analysis factors for plain concrete work
- (f) 'Loop-In' method for internal electrification.

SECTION - B

ANSWER ANY TWO

3. (a) List the major components of an overhead distribution network in an external electrification scheme. Explain 'guard wires'. 7
- (b) A 2 km long LT overhead distribution line, 3 phase 50 Hz is to be erected from a 100 kVA pole mounted substation. PCC poles of 8 mtr length are to be used. Assuming distance between adjacent poles is 50 mtr and $6/1 \times 2.59$ mm ACSR conductor is to be used for 3 phase wires and $6/1 \times 2.11$ ACSR conductor is to be used for neutral wire, calculate the following :
- (i) Nos. of poles.
 - (ii) Length of conductors required.
 - (iii) Nos. of insulation (vertical configuration).
 - (iv) Nos. of LT earthing sets required.
4. (a) Briefly explain the purpose and working of the following : 7
- (i) R C C B
 - (ii) M C C B
- (b) Draw the schematic and wiring diagram for the electrical points shown below on the same sub-circuit, controlled by independent switches using 'LOOP - IN' system of wiring. 7



TL = Tube Light 5 A = 5 Amp Socket
 F = Fan 15 A = 15 Amp Socket
 S.B = Switch Board D = Door

5. (a) What are various Methods of earthing ? 7
 (b) What are methods for protection against Lightening ? 7

6. (a) List the components of a borewell and briefly explain the purpose of each. 7
 (b) It is required to design an illumination scheme of a large hall 30 mtr x 15 mtr. The required illumination level is 120 lux. The mounting height is 3.0 mtr and space-height ratio is 1.25. Draw the layout of the illumination scheme after calculating the following (show only position of fittings) : 7
 - (i) Number of flourescent single tube 40W fittings required and total wattage. ('O' = 2400 lumen
 'Cu' = 0.7, 'MF' = 0.8)
 - (ii) Spacing between tube fittings.
 - (iii) Nos. of tube fittings along the length and width.

ANSWER ANY TWO

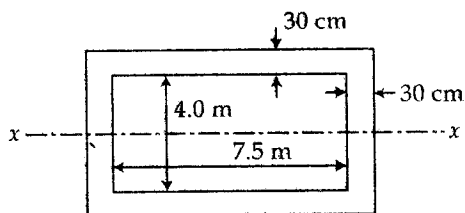
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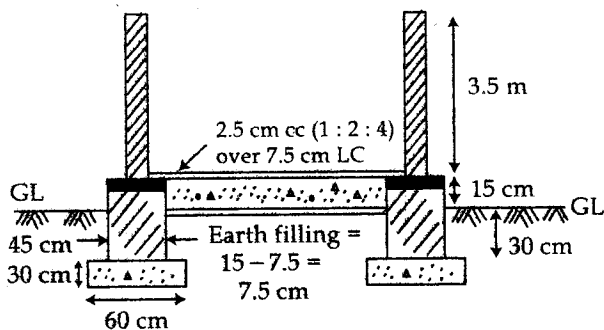
8. The relevant survey data and the proposed formation levels for a road aligned along a given direction is tabulated as shown. Assuming trapezoidal cross-section of the proposed road, with side slopes of 1 : 1, and formation width 7.5m, compute the earthwork in cutting and filling as the case may be. Draw a hand sketch showing the natural ground and formation line along it. 14

Distance (Chainage)	0 m	30 m	60 m	90 m	130 m	150 m	180 m
Natural Surface Level	111.87 m	111.87 m	115.62 m	114.50 m	116.31 m	113.90 m	115.20 m
Proposed formation level	111.87 m	111.87 m	111.97 m	112.07 m	112.203 m	112.203 m	112.203 m

9. An open water tank has to be constructed overground with 1st class brick work in 1 : 6 cement-sand mortar in plinth and foundation, as per plan and section given. Estimate the first class brick work required only in plinth and foundation by both centre-line method and long and short wall method, respectively. 14



Plan (Not to scale)



Section at x - x (Not to scale)

Also estimate the 13 mm thick plaster on inside and outside walls, in cm (1 : 6).

Assume any other data as may be necessary, clearly monitoring the assumption.