No. of Printed Pages : 8 **BET-038**

01830

Diploma in Electrical and Mechanical Engineering

Term-End Examination

June, 2010

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'* to the statements given below : **1x8=8**

   (a) External plastering of a building is also called rendering.

   (b) 'Painting' is a preventive and decorative measure in the absence of external plaster.

   (c) MES SSR part I specifies technical specifications of the items to be incorporated in a work.

   (d) Luminous flux is the rate of flow of radiant energy emanated by the radiating source.

   (e) The permissible voltage drop for any circuit must not be more than 5% for power loads for the declared supply of voltage.

(f) Several wires when stranded together in a common insulation one known as cable.

(g) Cast - in - situ concrete can be plain or reinforced.

(h) Rate analysis of an item assists in determining the working cost of an item.

2. Write short notes on *any three* of the following : **3x2=6**

(a) Use of RCCB.

(b) Slump Test.

(c) MES SSR Part II.

(d) Plastering and its purpose.

(e) Concreting under water.

(f) Broad categories of cement concrete works.

SECTION 'B'

Attempt *any two* questions only :

3\. (a) Structurally water pipes of an external water supply scheme must resist a number of forces. Explain briefly each of the forces. 7

(b) Write short notes on :

(i) Air valves used in water supply schemes. 7

(ii) Methods of water treatment.

(iii) Testing of water mains after laying.

4\. (a) Draw a labelled cross - section of a typical pipe earthing system. Define earth electrode, earthing lead and earth continuity conductor. 7

(b) An external electrification scheme has to be planned for feeding a load of 30 kW. The specifications are : 7

(i) Length of line - 750 mtrs.

(ii) Supply - 415 V/240 V, 0.8 p.f. lagging.

(iii) 3 phase 4 wire vertical configuration system.

(iv) Span between 2 poles - 50 mtrs.

(v) Size of conductor -

ACSR $6/1 \times 2.59$ weasel.

Calculate the following :

(A) Number of 8 mtr long PCC poles required.

(B) Current in the circuit carried by the overhead line.

(C) Length of ACSR conductor required.

(D) Number of shackle insulation required.

(E) Draw a line plan of the proposed scheme.

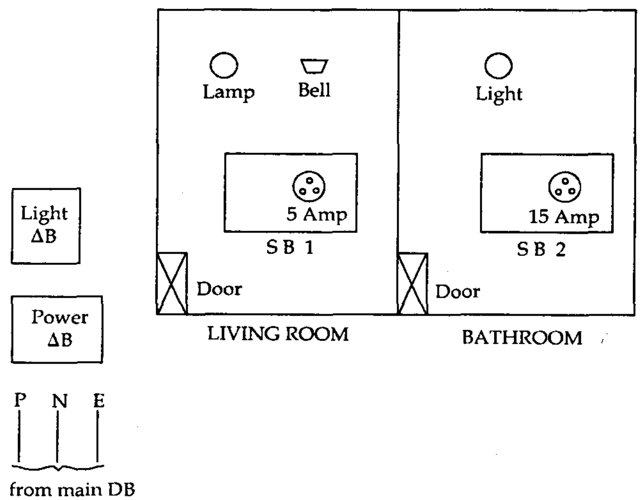
5. (a) Briefly explain the following methods of lighting calculations : 7

(i) Watts per square meter method.

(ii) Lumen or light lux method.

(iii) Inverse square law method.

(b) Draw the schematic and wiring diagram for controlling one lamp, one bell from one switch board including one 5 Amp. socket and another switch board controlling one geyser point (15 Amps) and one light as shown in the plan. All connections originate from sub-main ΔB. Recommend the size of copper wire for light circuit and power circuit. 7



SECTION 'C'

Attempt *any two* questions only :

6. (a) What is the purpose of slump test ? Explain the procedure for carrying out slump test. Explain the procedure for rate analysis of plain concrete work. 7

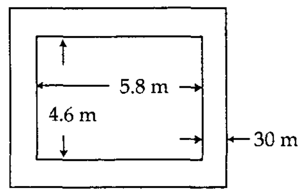
   (b) Explain the following : 7

   (i) Average cross - sectional area method for calculating earth work in long trenches.

   (ii) Centre - line method for calculating earthwork in excavation in building foundation.

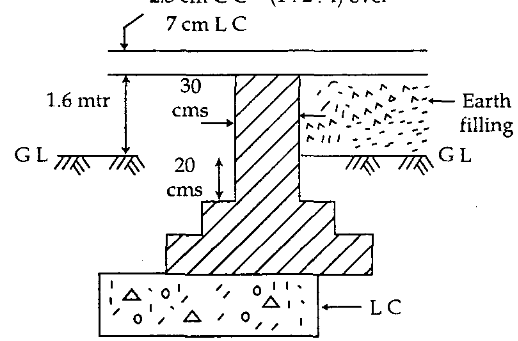
7. (a) Explain earthwork in excavation for laying of pipes and cables in trenches. Draw the standard or ideal cross - section of a trench for laying of an LT cable. 7

(b) A simple brick masonary platform has to be plastered over outside face of walls with 13 mm thick plastering in CM (1 : 6) upto 10 cm below GL. Compute the required quantity of this plastering as per format given. **7**



Section Plan A - A

(Not to scale)



Section through a (not to scale) wall of the platform.

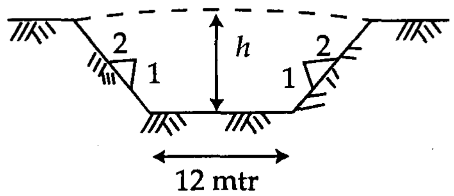
Compute in a tabular manner :

Item	No	L (m)	B (m)	H/Δ(m)	Quantity	Remarks
13 mm Thick Plastering as specified						
				Total		

8. A survey was conducted for a proposed road of 150 mtrs and the data recorded is given below. The proposed width of road formation is 12.0 mtrs, side slopes in cutting are 1 : 2 and side slopes in filling is 1 : 2.5. Cross slope of the ground is NIL. Calculate the quantity of earthwork as per format given. **14**

Chainage →	0	25	50	75	100	125	150
RL of ground →	104	104.4	104.55	104.80	105.1	105.8	105.6
RL of Proposed formation →	104.13	104.3	104.46	104.63	104.80	104.96	105.13
Proposed gradient of road	← Rising gradient of 1 mtr in 150 mtr →						
Obligatory Point - 104.80 at 100 mtr chainage							

Cross section in cutting :



Compute Earth work as per format :

Chainage	Difference of GL & formation		Mean value		Total × sectional area b × hm+zh²m	Distance between adjacent chainage points (*l*)	Qty of Earthwork between 2 chainage points	
	Cutting (h)	filling (h)	Cutting (hm)	filling (hm)			Cutting	filling
0	-	0.13						
14.06	0	0						
25	0.10	-						
50	0.09	-						
75	0.17	-						
100	0.30	-						
125	0.84	-						
150	0.47	-						
All dimensions in metres						TOTAL	?	?