2007

CIVIL ENGINEERING (Paper II)   006312

Time allowed : 3 Hours }   **{ Maximum Marks : 200**

Note :   (i)   *Solve one question from each section.*

(ii)   *If more than one questions are attempted in a section, the excess will be ignored.*

(iii)   *Figures to the right indicate the number of marks for the question / sub-question.*

(iv)   *Make suitable assumptions, if necessary and state the same.*

(v)   *Use of log-tables, non-programmable calculators is permitted.*

(vi)   *Use of any kind of I.S. Codes and Steel Table Codes is <u>NOT</u> permitted.*

(vii)   *Candidate should not write roll number, any name (including their own), signature address or any indication of their identity anywhere inside the answer book otherwise he will be penalised.*

SECTION - A

1.   (a)   The following are the lengths and bearings of the sides of a closed traverse ABCD.   **15**
Compute the length and bearing of line DA :

Line	Length in meter	Bearings
AB	76.80	140° 12'
BC	195.60	36° 24'
CD	37.20	338° 48'
DA	?	?

(b)   Explain clearly the two point problem and how it is solved ?   **11**

(c)   What are the characteristics of contour lines ?   **8**

P.T.O.

2. (a) The following is the data relative to observations made on a vertically held staff **12** with a tachometer fitted with an anallatic lens. The constant of the instrument was 100. Calculate the distance 'AB' and the reduced levels of 'A' and 'B' :

Instrument Station	Height of axis	Staff Station	WCB	Vertical Angle	Hair Readings	Remark
O	1.56	A	12° 25 '	0° 0 '	1.88, 2.25, 2.62	R.L. of "O" 130.25
		B	60° 45 '	+15° 10 '	1.83, 2.15, 2.47	

(b) What is transition curve ? Why it is used ? Define shift of a curve. **10**

(c) What is meant by a satellite station and reduction to centre ? How would you **12** correct the observation when made upon an eccentric signal ?

SECTION - B

3. (a) What are the common defects in paintings, their causes and remedial measures ? **10**

(b) What are the methods of Artificial seasoning ? **10**

(c) Explain setting time test of cement and its importance. **14**

4. (a) Describe various types of fire protection systems. **12**

(b) What are the factors affecting ventilation of building ? **10**

(c) Mention the various aspects and prospects to be considered under Regulations **12** and Byelaws, by the Architect while planning and designing the layout of a building.

SECTION - C

5. (a) What is meant by safe bearing capacity of soil ? Explain plate loading test for **10** determination of bearing capacity ?

(b) What are the general principles in bricks masonry construction ? What are the **11** rules for bricks bonding ?

(c) What are the advantages of constructing steel roof trusses over timber trusses ? **12** Explain any one method of Damp proofing of flat RCC roofs.

(b) Define the following terms with reference to CPM/PERT network. **10**

    (i) Dummy activity

    (ii) Critical Path

    (iii) Float

    (iv) Dangling Error

    (v) Event

(c) Enumerate the factors in selecting the pump. Differentiate clearly between a **11** reciprocating pump and a centrifugal pump.

SECTION - F

11. (a) Describe 'Needle beam method' of tunnelling and state the soil condition suitable **12** for this.

    (b) Explain the different methods of ventilation during construction of tunnels. **10**

    (c) What are the factors influencing the shape of tunnels ? **11**

12. (a) What are faults ? How are faults recognized in the field ? **10**

    (b) What are the main geological problems associated with Dam sites ? Explain **11**

    (c) What is Sedimentary Rock ? Classify Sedimentary rocks into various classes and **12** give a brief description of each class.

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SECTION - D

7. (a) Compute the intensity of active and passive earth pressure at depth 8 meter in dry cohesionless sand with an angle of internal friction of 30° and unit weight of 18 kN/m³. Also calculate the total earth pressure and its line of action. What will be the intensity of active pressure if the water level rises to the ground level ? Take saturated unit weight of sand as 22 kN/m³. **11**

   (b) Define : **12**

      (i) Shear strength

      (ii) Cohesion

      (iii) Angle of internal friction of soil

      (iv) Optimum moisture content

   (c) What is Coffer dam ? Explain its type with sketches. **10**

8. (a) What are the different methods of soil stabilization ? **11**

   (b) What is a flow net ? What are its uses ? **10**

   (c) What are the different types of shallow foundation ? Discuss with sketches. **12**

SECTION - E

9. (a) What is A-B-C control policy of inventory ? What are the objectives and functions of store management ? **11**

   (b) What is control chart ? Explain any two control charts of sampling plan. **12**

   (c) What is scientific management ? Explain principles of scientific management. **10**

10. (a) What safety measures will you adopt in the following situations : **12**

      (i) Storage and handling of building materials.

      (ii) Demolition of a building

6.   (a)   The line plan of a residential building is given in figure No. 1.   **20**

Figure 1. Not to scale.

$W_1 = 0.9\,m \times 1.40\,m$

$W_2 = 0.75\,m \times 1.40\,m$

$D_1 = 1.00\,m \times 2.00\,m$

$D_2 = 0.90\,m \times 2.00\,m$
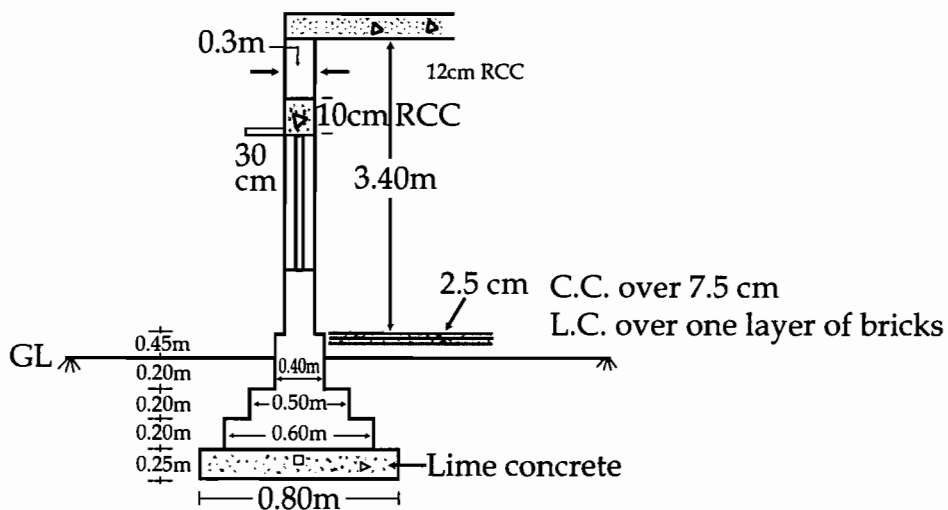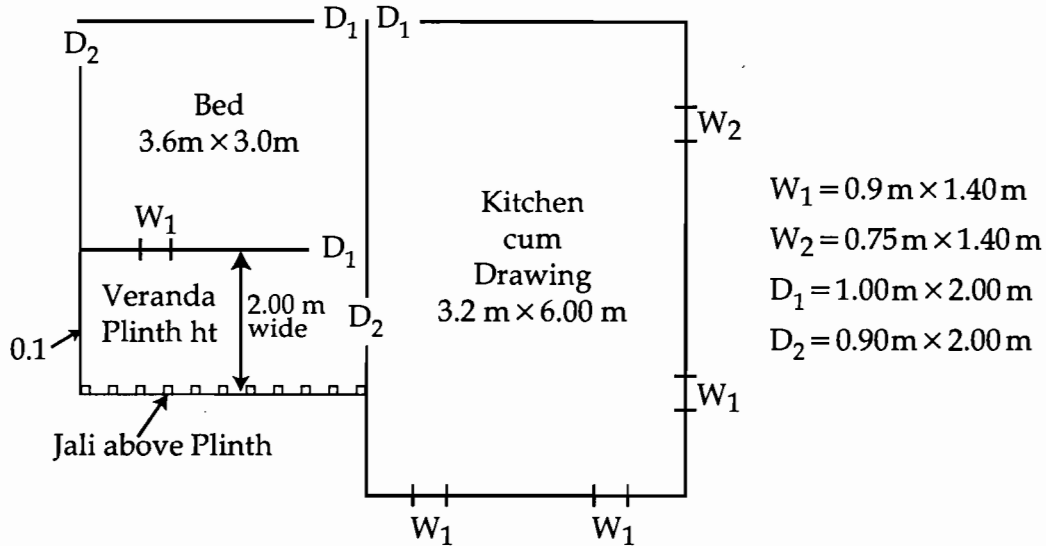
Section of Main Wall

Estimate the quantities of the following items of work in measurement sheet.

(i)   Excavation

(ii)   2.5 cm. thick D.P.C. at plinth

(iii)   Ist class brick work in foundation and plinth in lime mortar

(iv)   Inside plastering

(b)   What is unbalanced tender ? Explain with example.   **8**

(c)   What are the factors to be considered in Rate analysis ?   **5**