ASD

2009

106328　　　　**CIVIL ENGINEERING (Paper II)**

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/she will be penalised.

SECTION - A

1.　(a)　State the advantages and disadvantages of plane tabling.　　**10**

　　　　(Minimum five points for each)

　　(b)　State and explain the applications of aerial photo interpretation.　　**10**

　　(c)　Due to some problems with the equipment, the bearings and two sides were not　　**14**
　　　　taken for a closed traverse ABCDEA. From the available data compute the
　　　　bearings of the two sides.

Line	AB	BC	CD	DE	EA
Length (m)	230.5	250.2	210.8	240.3	265.4
Bearing	N 36°45'E	S 82° 48'E	S 10°10'E	Missing	Missing

2.　(a)　What are reverse curves ? What is the necessity of providing reverse curves ?　　**10**
　　　　What are the disadvantages of a reverse curve ?

　　(b)　Explain the principle of triangulation. What are the purposes of triangulation　　**10**
　　　　surveys ?

P.T.O.

(c) A 50 metre long tape has been standardised at 25°C under a pull of 100 N. During 14
the field measurements the tape was supported at two points A and B. The
elevations of A and B were 110.385 m and 110.120 m with respect to a local
bench mark. Elevation of A above mean sea level is 1163. 853 m. The temperature
and pull during the measurement were 42°C and 150 N respectively. Find the
corrected length of a tape length reduced to mean sea level.

[Consider radius of earth = 6370 KM,

Coefficient of linear thermal expansion = $11 \times 10^{-6}/°C$

Elasticity modulus of tape = 2×10^{11} N/m²]

SECTION - B

3. (a) What are the various ingredients of Portland cement ? Discuss the function played 14
by each in imparting specific properties to it.

(b) What are the characteristics of good brick earth ? 10

(c) What is plastering ? What are the objectives of plastering ? 10

4. (a) Inside dimensions of a stair in a residential structure are 2.5 m × 5.0 m and height 14
of the room is 3.6 m. Design a dog-legged staircase with a rise of 15 centimeter.

(b) Write short note on acoustical defects. 10

(c) What are traps ? Draw neat sketches for P-trap, Q-trap and S-trap. 10

SECTION - C

5. (a) Differentiate between load bearing structure and frame structure. 13

(b) State the advantages of steel trusses over timber trusses. 10

(c) State various methods used for dewatering of foundation trenches. Explain with 10
a sketch, the well-point system.

6. (a) Prepare an approximate estimate of a residential building with following details. 13
   - RCC frame (G + 4 Storeys)
   - Plinth area (on each floor) = 500 m²
   - Plinth area rate_____ = Rs. 1,00,000 per m²
   - Cost of electrification, plumbing etc., 15% of building cost.
   - Provide 5% for contingencies and 2% for work-charged establishment of
     total cost.

(b) What is an estimate ? Explain the difference between revised estimate and supplementary estimate.   **10**

(c) What do you mean by depreciation ? Differentiate between depreciation and obsolescence.   **10**

SECTION - D

7. (a) What do you mean by consistency of soils ? State the uses of consistency limits.   **10**

(b) A load of 1200 kN acts as a point load at the surface of a soil mass. Determine the stress at a point 4 m below and 3 m away from the point of action of load by Boussinesq's formula. Compare the value with that obtained from Westergaard's theory, considering poisson ratio $= 0$.   **10**

(c) Under certain loading, a layer of clay is expected to undergo full settlement of 18 centimeters. Also, it is expected to settle by 5 centimeters in the period of 2 months of loading. Find the time required for the clay layer to settle by 10 centimeters.   **13**

$$\left[\text{for U<60\%, time factor} = \frac{\pi}{4}\left(\frac{U}{100}\right)^2 \right]$$

8. (a) Distinguish between consolidation and compaction. Also calculate the compactive energy applied to soil during stand Proctor test.   **10**

(b) What are the limiting values of lateral earth pressure at a depth of 3 m in a uniform sand fill with unit weight of 18 kN/m^3 and $\phi = 32°$. The ground surface is level.   **10**

If a retaining wall with a smooth and vertical back is interposed, determine the total active and passive thrusts which will act on the wall.

(c) Distinguish between :   **13**

(i)   General shear and punching shear failures.

(ii) Deep foundation and shallow foundation.

(iii) Finite and infinite slopes and causes of failure of slopes.

SECTION - E

9. (a) What are the objectives of construction management ? State and describe the functions (like planning, organising...) of construction management.   10

   (b) Describe the importance of safety in construction. What are the various safety measures adopted at the time of demolition of a building ?   10

   (c) Write detailed note on quality control of following construction items :   13

   (i) Concrete   (ii) Steel

   (iii) Form-work   (iv) Sanitary and water supply

10. (a) What are the principles normally adopted in storing materials ?   10

   (b) Define and explain the following :   10

   (i) Event   (ii) Activity

   (iii) Dummy   (iv) Float

   (c) State the different methods of estimating depreciation of construction equipment.   13

   Explain double decline balance method of depreciation with the help of following example.

   Cost of equipment = Rs. 12 lakhs.

   Estimated life of equipment = 5 years.

   Estimated salvage value = Rs. 2 lakhs.

   Calculate depreciation and book value for each of the five years life.

SECTION - F

11. (a) What is fold ? With the help of neat sketches describe various parts of a fold.   10

   (b) What are the factors of metamorphism ? Write five structures of the metamorphic rock with neat sketches.   10

   (c) What is a dam ? Describe the types of dam and suitable rock types of site in their selection.   13

12. (a) State the advantages of circular section and horse-shoe section of tunnels. Explain   **10**
         the various parameters considered to arrive at dimensions to be given to a tunnel
         section.

    (b) Explain with the help of neat sketch the central drift method of tunnelling in   **10**
         rock. State the advantages and disadvantages of this method.

    (c) What are the requirements of ventilating system in a tunnel ? Explain the natural   **13**
         and mechanical methods of ventilation.

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