B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

ADVANCED CONCRETE DESIGN

Time : 3 Hours] [Total Marks : 100

Note : (1) Attempt all questions.
      (2) All questions carry equal marks.

1 Attempt any two parts of the following : \(10 \times 2 = 20\)
   a) Design middle ring beam, balcony and vertical wall for an intze type tank shown in figure 1

Fig. 1

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b) Design the top dome, top ring beam and vertical wall for circular overhead tank shown in figure 2.

\[ \text{Fig. 2} \]

\[ \text{c) Design a ring beam of size } 300 \times 500 \text{ mm supported by columns of 300 dia and subjected to a load of 55 kN/m. Dia of staging is 5.0 m and HT in ring beam is 100 km. The co-efficient for BM are as given below:} \]

\[-\text{ve BM} = 0.137 \text{ WR}^2(2.0)\]
\[+\text{ve BM} = 0.07 \text{ WR}^2(2.0)\]
\[\text{torsion BM} = 0.021 \text{ WR}^2(2.0)\]

2 Attempt any two parts of the following : \(10 \times 2 = 20\)

a) Explain in detail how wind load is calculated in overhead water tanks.

b) Explain how horizontal load causes BM in columns and bracer of staging.

c) Design an annular raft foundation for following data:

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c/c dia of staging - 12.0m
BC of soil - 100 kN/m²
Total load at Base - 16000 kN
Windmount at Base - 4600 kN-M

3 Attempt any two parts of the following: 10×2=20
a) Explain the portal method of analysis for building frame.
b) Explain the cantilever method of analysis for building frame.
c) Discuss substitute frame method for analysis of building frames.

4 Attempt any two parts of the following: 10×2=20
a) Discuss the Pigeand’s method for finding out moment in a slab due to concentrated load.
b) Discuss Courban’s method of load distribution in longitudinal grades.
c) Design a slab bridge for clam AA (tracked) vehicle loading for the following data.
   Clean span = 4.5 m
   Clean width of roadway = 7.0 m
   Use M-25 concrete and HYSD 415 bars.

5 Attempt any four of the following: 4×5=20
i) High performance concrete
ii) High strength concrete
iii) Self compacting concrete
iv) Composite construction
v) Polymer concrete
vi) Fire reinforced concrete.