Roll No ....

CE-7001 (CBGS)
B.E. VII Semester
Examination, November 2018
Choice Based Grading System (CBGS)
Advance Structural Design -I (RCC)
Time : Three Hours
Maximum Marks : 70

Note: a) Attempt any five questions. All questions carry equal marks.

    i) Assume suitable data if required and mention it clearly.

    ii) Use of IS 456 is permitted.

    v) Draw neat and clean diagrams as and when required to support your answer.

    https://www.rgpvonline.com

1. Compute the maximum bending moment for a solid slab bridge for the following data: 14

    Load   = Class AA tracked vehicle

    Clear span   = 6 m

    Clear width or road way   = 7.5 m

    Average thickness of wearing coat = 80 mm

    The width of bearing   = 0.4 m

    Use M-20 grade of concrete and Fe 415 steel.

2. Write short notes on the following: (Any four)   4×3.5=14

    a) IRC loadings for road bridges.

    b) Losses in prestressed concrete.

    c) Braced and unbraced building.

    d) Functions and types of shear wall.

    e) Merits and demerits of prestressed concrete.

3. What do you understand by a substitute frame? How do you select it? Discuss in brief the method of analysis.   14

4. Design side walls of a bunker to store 300 kN of coal, for the following data: 14

    Unit weight of coal   = 8340 N/m³

    Angle of repose   = 30°

    The stored coal is to be surcharged at its angle of repose. Take permissible stress in steel as 140 N/mm².

5. Distinguish clearly between a bunker and a silo. Using Airy's theory, show that the height up to which a bin behaves as a shallow bin is given by   14

$$h - b = \sqrt{\frac{\mu\left(1+\mu^2\right)}{\mu+\mu'}}$$

6. Design a conical dome of an Intze tank of 800,000 litres capacity. The height of staging is 16 m up to the bottom of tank. The bearing capacity of soil may be assumed to be 150 kN/m². Assume the intensity of wind pressure as 1500 N/m². Use M concrete and HYSD bars.   14

7. a) A circular tank has an internal diameter of 10 m and has maximum height water as 4 m. The walls of the tank are restrained at the base. Determine the values of maximum hoop tension and its location, and the maximum cantilever bending moment by the following methods: 7

    i) Reissner's method   ii) Carpenter's method

    b) Explain the method of designing a shear key for a retaining wall   https://www.rgpvonline.com   7

8. Design toe slab of a counter fort retaining wall to retain 7 m high embankment above ground level. The foundation is to be taken 1 m deep where the safe bearing capacity of soil may be taken as 180 kN/m². The top of earth retained is horizontal and soil weighs 18kN/m³ with angle of internal friction $\phi = 30°$. Coefficient of friction between concrete and soil may be taken as 0.5. Use M 20 concrete and Fe 415 steel.   14

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