

End Semester Examinations - 2015-16 Even Semester - May 2016

14CE2029 Advanced Reinforced Concrete Structures

Set B

Time : 3 hrs
Total Marks: 100

1. a) Label the components of flat slab and its types. (5)
- b) Design the interior panel of a flat slab floor system for a warehouse 22 m x 22 m divided into panels of 5m x 5m with drops and column head, using the provisions of IS 456 for the direct design method.
- Loading class = 6.25 kN/m^2
- Column size = 550 mm diameter
- Materials = M 25 grade concrete and Fe 415 bars (15)

OR

2. a) Describe the necessity of flat slab. Also comment on its advantages.(5)
- b) Design the exterior panel of a flat slab floor system for a warehouse 24m by 24 m divided into panels of 6 m by 6m.
- Loading class = 5 kN/mm^2
- Column size = 450mm diameter
- Materials = M 20 grade concrete and Fe 415 HYSD bars (15)
3. a) List out the various IRC loading for bridge design and discuss the conditions for Courbon's method. (5)
- b) A simply supported RC slab is required for the deck of a road bridge having the data given below:
- Width of carriage = 6.8 m
- Width of kerb = 600mm
- Clear span = 5 m
- Width of bearing = 400mm
- Thickness of wearing coat = 80mm
- Type of loading: IRC class AA or A, whichever gives the worse effect.
- Materials: M20 grade of concrete, Fe 415 grade HYSD bars (15)

OR

4. Design the deck slab and longitudinal girder of T-beam girder bridge to suit the following data:
- Clear roadway = 7.5m .Assume three T-beams spaced at 2.5m intervals. Effective span of T-beam = 14m.
- Assume cross beams at 3.5 m intervals. M20 grade of concrete and Fe 415 HYSD bars

5. a) Explain the concept of corbel and modes of failures with neat diagram. (5)
- b) Design a corbel to support a gantry girder reaction of 350kN at service condition acting at a distance of 225mm from the face of a 350 x350 mm column. The concrete mix of grade M25 and HYSD steel of grade Fe415 are used for construction. (15)

OR

6. a) Describe briefly on provisions of reinforcement in deep beam.(5)
- b) Design an interior span of a continuous deep beam 500mm wide and 6 m deep simply supported over a clear span of 10m. The beam carries a UDL of 180kN/m at the service state and is supported on wall of 500mm thick on each end. Use M20 & Fe415 steel having permissible tensile stress of 230 N/mm². (15)
7. a) Name two approximate methods by which design of grid floor is carried out. Explain any one briefly. (5)
- b) A RC grid floor is to be designed to cover a floor area of 11 m x 15 m. The spacing of ribs in mutually perpendicular direction is 1.5 m c/c. Live load on floor is 3kN/m². Adopt M20 and Fe 415. Assume the ends are simply supported. Analyze the grid floor by IS 456: 2000 and design suitable reinforcement in the grid floor. (15)

OR

8. a) Explain the concept of grid floor and comment on its types and uses.(5)
- b) A RC grid floor is to be designed to cover a floor area of 13 m x 17 m. The spacing of ribs in mutually perpendicular direction is 1.5 m c/c. Live load on floor is 2.5kN/m². Adopt M30 and Fe 415. Assume the ends are simply supported. Analyze the grid floor by Rankine Grashoff Method and design suitable reinforcement in the grid floor. (15)
9. a) Describe briefly on domes and identify its uses in civil engineering.(5)
- b) Design a conical dome roof for a room with base diameter as 12m. The live load due to wind and snow may be taken as 1000N/m². The height of the roof is 4m. Use M20 concrete and Fe 415 steel. (15)

Wishing you All the Best
