Model Question Paper

Seventh Semester B.Tech Degree Examination, November 2016

(2013 Scheme)

13.702 DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES (C)

Time : 4 Hours        Max Marks :150

Instructions: Use of relevant codes IS:456-2000, IS:3370, IRC 6 and 21 and design charts are permitted.

PART-A (Answer all questions)

1. Explain different types of retaining walls with neat sketches 20 Marks
2. What are the design principles of prestressed concrete bridges. 20 Marks

PART-B

(Answer any one full question from each module.)

Module I

3.a) Design a cantilever retaining wall to retain earth 4 m high above ground level. Consider the backfill surface to be inclined at an angle of 15° with the horizontal. The unit weight of soil is 18 kN/m³, angle of repose 30°; safe bearing capacity of soil 150 kN/m² and coefficient of friction between soil and concrete is 0.5. Use M20 concrete and Fe 415 grade steel.

Draw to a suitable scale: i) Vertical cross section of retaining wall and 25 Marks
b) ii) Longitudinal section through stem

OR
4.a) Design a circular water tank at a height of 6m resting on six columns. The capacity of the tank is $1.1 \times 10^5$ litres. Use M20 concrete and Fe 415 grade steel.

Draw to a suitable scale: i) Vertical section showing reinforcement details and ii) Plan showing reinforcement in the base slab

Module II

5.a) Design a slab bridge for the following requirements:

- Clear span: 4.5 m
- Clear width of road way: 7 m
- Live load: Class A loading
- Average thickness of wearing coat: 80 mm

Use M20 concrete and Fe 415 grade steel.

Draw to a suitable scale: i) Longitudinal section showing reinforcement details and ii) Plan showing reinforcement in the slab.

OR

6.a) Design the interior panel of a flat slab 5.5 x 6.25 m in size for a super imposed live load of 7 kN/m$^2$. Use M20 concrete and Fe 415 grade steel.

Draw to a suitable scale: i) Cross section through column strip and ii) Plan showing top reinforcement in the slab.