Hall Ticket Number:

Code No. : 32011

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Civil Engg.) III Year II-Semester Main Examinations, May-2017

Reinforced Concrete Design-II

Time: 3 hours Max. Marks: 70

Note: i) Answer **all** questions in **Part-A** and **Part-B**
ii) Missing data, if any may, suitably be assumed
iii) Use of IS 456, code for water tanks and bridges are permitted

Part-A (10 × 2 = 20 Marks)

1. State the conditions in which combined footings are preferred.
2. What is the purpose of providing shear key in retaining walls?
3. Differentiate between counter fort retaining wall and cantilever retaining wall.
4. State the necessity of distribution reinforcement in water tanks.
5. List the situations in which overhead water tanks are preferred over ground level tanks.
6. What are the various checks in design of water tanks?
7. List the conditions in which Courbon's theory is effective in the analysis of girders.
8. Explain the use of pigeaud's curves in the determination of bending moments in a slab.
9. State the design forces on the kerb.
10. Determine the impact factor for class A loading for a span of 12 m.

Part-B (50 Marks)

11. Design a combined footing supporting two columns of an hospital building having column size of 400 × 400 mm each subjected to an axial loads of 1000 kN and 1300 kN on columns with a spacing of 3 m centre to centre. The SBC of soil shall be taken as 350 kN/m^2. The concrete and steel grades are M 20 and Fe 415. Sketch combined footing along with reinforcement details. [15]

(or)

12. Design a cantilever retaining wall to retain earth 4m above ground level. The top of the earth is to be level. The density of soil is 15 kN/m^3 and the angle of internal friction of soil is 30^0, the safe bearing capacity of soil is 200 kN/m^2 and coefficient of friction between soil and wall is 0.4. Use M 20 concrete and Fe 415. Sketch a neat section of a retaining wall along with reinforcement. [15]

13. Design a rectangular water tank of 10 m × 10 m in plan and 5 m deep. It rests on the ground with its walls fixed at the base. Use M 20 concrete and Fe 415 steel. Sketch a neat section of tank showing main reinforcement and transverse reinforcement. Apply all checks as per IS codes. [15]

(or)

14. Design the top dome and side wall of an overhead circular water tank of capacity 1.75 million litres, supported on an elevated tower comprising 12 columns. Adopt M 20 grade concrete and Fe 415 grade steel. Sketch the reinforcement details. [15]

Contd...2

15. Design interior panel of a T-beam bridge using the data as follows: [20]
width of the carriage way 7.5 m, railing of 150 mm thick RC wall, kerb 600 mm × 225 mm, wearing coat of 90 mm thick asphalt concrete, spacing of longitudinal girders spaced at 3.0 m centre to centre, spacing of cross girders of 3.5 m centre to centre. Consider Class – AA (tracked) loading and materials of M 20 and Fe 415.

(or)

16. Design an RC slab culvert for IRC class A loading to suit the following data: [20]
A two lane carriage way = 7.5 m wide
Foot paths on either side = 1.2 m wide
Clear span = 7 m
Wearing coat = 80 mm
Width of bearing = 0.5 m
Materials = M 25 and Fe 415
Sketch the details of reinforcements in the longitudinal and cross sections of the slab.

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