**NR**

**Code No: NR 410114**

IV B.Tech I Semester Supplementary Examinations, November-2005

STRUCTURAL ENGINEERING-III (RCC STEEL) DESIGN & DRAWING
(Civil Engineering)

Time: 3 hours Max Marks: 80

**PART-A**

**Answer any ONE question from PART-A [32Marks]**

1. Design a deck slab bridge for the following data:
   Clear distance between abutments: 6.7m
   Road: National Highway (Two lane)
   Footpath: 1m on either side
   Wearing Coat: 80mm(average)
   Loading: IRC class AA (Tracked)
   Materials: M-30 concrete; Fe-415 steel
   Draw to a suitable scale;
   i) Longitudinal section of the bridge with reinforcement details.
   ii) Cross section of the slab with all details. [24+8]

2. Design the central section of a riveted plate girder for a bridge for a live load of 80 kN/m longer than the span and dead load of 40 kN/m. The girder is simply supported over a span of 16m. Also design the intermediate and end bearing stiffness.
   Draw the longitudinal and cross section of the girder with all details. [24+8]

**PART-B**

**Answer any THREE questions from PART-B**

3. Design a reinforced box culvert having inside dimensions of 3mx3m. This culvert is subjected to a dead load of 14,000N/m$^2$ and a live load of 60 kN/m$^2$. The unit weight of soil is 18,000 N/m$^3$. The angle of repose of soil is 30$^0$. Use M-25 concrete and Fe- 415 steel. Show the reinforcement details. [16]

**Contd…2**

4. A dog legged staircase for a residential flat consists of 18 steps, each of 300mm tread and 180mm rise, with an intermediate landing 1.2m in width at the middle. The width of stair case is also 1.2m. If the flights are of equal number of steps. Design the staircase and detail the steel use $f_{ck} = 20N/mm^2$ and $f_y = 415N/mm^2$. [16]

5. a) Explain briefly chimneys made in concrete.
   b) Obtain expressions for stresses in chimney shaft due to self weight and wind pressure. [4+12]

6. Design an intz type water tank of the ring beam and top dome at the junction of top dome and vertical wall. The diameter of the tank is 6.5m. Rise of the dome can be taken as ¼ span. Live load $0.5kN/m^2$. Use M-25 concrete and Fe-250 steel. [16]

7. Explain the following in brief: [4+4+4+4]

   a) Design of stairs as per IS-456
   b) Effective width method of analysis
   c) Economic span length
   d) Dynamic effect on R.C. Chimney.

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