

Code No: NR 410114

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**IV- B.Tech- I-Semester – Supplementary- Examinations-April/May –2005**  
**STRUCTURAL ENGINEERING-III (RCC & STEEL) DESIGN AND DRAWING**  
**(Civil Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any TWO questions from part A and THREE questions from part B**

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**NOTE: Use of I.S. codes and Design charts permitted .**  
**Assume suitable data whenever necessary.**

**Part-A**

**(32 Marks)**

1. Design an R.C. slab bridge for a span of 6m, if the clear width of roadway=8m, to carry a live load of IRC: class A loading using M30 grade of concrete. The average thickness of wearing coat is 80mm. Draw to a suitable scale  
(a) C.S. and (b) L.S. of the bridge showing the reinforcement details.
2. Design a plate girder railway bridge of span 20m c/c of bearings for broad-gauge (B.G) single track main-line loading. Draw to a suitable scale the  
(a) L.S. and (b) C.S showing the details.

**Part-B**

**(48 Marks)**

3. Design an R.C. box culvert having inside dimensions  $3.5 \text{ m} \times 3.5 \text{ m}$  to carry a super imposed dead load of  $12 \text{ KN/m}^2$  and a live load of  $50 \text{ KN/m}^2$ . Consider any one case of loading. Take  $\rho=18\text{KN/m}^3$  and  $\phi=30^\circ$  for the soil.
4. Design one flight of stairs for a building taking the number of steps=14, tread =300mm and rise=150mm; width of landing beams=400mm. Use M20 grede concrete and Fe 415 steel.
5. Design an R.C. chimney of 30m height having 3m dia using M25 grade of concrete and Fe-415 grade steel. Check for stresses. Sketch the reinforcement details.

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6. Design the roof dome, top ring beam and cylindrical wall of an Intze type of water tank, 10m dia, the central rise of dome = 1.6m; vertical height of wall=4.5m. Assume suitable sloping bottom. Use M:20 grade of concrete and Fe415 grade steel.
7. Write short notes on any THREE of the following:-
- (a) Piegand's method of analysis.
  - (b) Courbon's theory.
  - (c) Foot bridges.
  - (d) Economic span length of bridge.

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