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**SUBJECT CODE NO: H-123**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**T.E. (Civil)**  
**Design of Structures - II (RCC)**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Question No. 1 and 6 are compulsory. Answer any two from section A & section B.
  - ii. Assume suitable data if necessary.
  - iii. Figures to right indicate the maximum marks.
  - iv. Use of non – programmable calculator is allowed.
  - v. Use of IS: 456 – 2000 is permitted.

**Section A**

- Q.1
- a) What are the advantage and disadvantages of providing large clear cover to reinforcement in flexural member? 03
  - b) Enumerate the different types of limit state with brief description. 04
  - c) Why is the provision of minimum reinforcement in Reinforced concrete beam? 03
- Q.2 Design simply supported beam of span 6M. is to carry A uniform dead load of 20KN/M. inclusive of self wt of beam. and uniform live load of 30KN/M. The width of the support is 230mm. assume M – 25 concrete and Fe – 415. 15
- Q.3 Design cantilever beam of span 2.75 Mt. is to carry A uniformly distributed load of 20 KN/M. The width of the support is 230mm. Assume M – 25 concrete and Fe- 500. Show the curtailment of reinforcement. 15
- Q.4
- a) What is mean by cracking? Explain the types of cracks. 03
  - b) A beam  $300\text{mm} \times 560\text{mm}$  effective is subjected to a factored bending moment 310KN. Determine the area of steel for doubly reinforced section. Use M – 20 concrete and Fe – 250 steel. Assume  $d' = 50\text{mm}$ . 12
- Q.5 An Isolated simply supported T – Beam has flange width 2300MM and flange thickness of 120MM, the effective span of the beam is 3.5 meter. The effective depth of the beam is 580MM and width 300MM. The beam having the reinforcement with 8 – 20 MM Tor use M20 and Fe 415 grade determine the moment of resistance of the section. 15

## Section B

- Q.6 Explain the following terms. 10
- Development length and necessity of the check.
  - Necessity of torsion reinforcement in the slab.
  - Relationship for the load carrying capacity of an axially loaded short column.
  - One – way slab and Two – way slab.
- Q.7 Design a reinforced concrete slab for a room  $4.2M \times 6.5M$  supported on a beam of Width 250MM. 15  
The slab is continuous over all supports, carrying a live load of  $4KN/M^2$  & floor finish  $1.0 KN/M^2$  assume mild exposure. Fe – 415 grade steel.
- Q.8 Design a dog legged stair case for a residential building having a room size  $5m \times 2.5M$ . Floor to 15  
floor height is 3M. The column size  $230MM \times 380MM$  take live load  $3KN/M^2$  & floor finish load  $0.9KN/M^2$  Use M20 and Fe – 415 grades.
- Q.9 Design isolated footing for square column  $500mm \times 500mm$  reinforced with 8 bars of 20mm 15  
diameter. And carrying axial load of 2000KN, S B C of soil is  $300KN/M^2$  at a depth of 2.0m below ground level. Assume M25 grade of concrete & Fe- 415 grade of steel. Show the reinforcement in details.
- Q.10 Design a rectangular column subjected to ultimate load of 2000KN. The column is 3.5M long & 15  
effectively held position at both ends but not restrained against rotation.  
Take M- 20 & Fe – 500 grades.