No. of Printed Pages : 4 **BAR-044**

BACHELOR OF ARCHITECTURE

00424

Term-End Examination

June, 2011

BAR-044 : THEORY OF STRUCTURES - V

Time : 3 hours *Maximum Marks : 70*

Note : *Question No.1 is* ***compulsory.*** *Attempt* ***any four*** *questions from the remaining questions. Use of calculator is permitted.*

1. Choose the most appropriate answer from the answers given in questions (a) to (g). **2x7=14**

(a) Select the correct statement.

(i) strength of M 20 concrete is taken to be 20 N/m^2

(ii) quality of water does not affect quality of concrete

(iii) mild steel is more ductile than medium tensile steel

(iv) chlorides do not affect reinforcement

(b) Normally slabs

(i) are not provided with shear reinforcement

(ii) have small thickness

(iii) of one way nature are designed as beams.

(iv) all the above

(c) Concrete in tension zone in a beam

(i) is neglected

(ii) is not neglected

(iii) is neglected but its self weight is considered

(iv) is not required

(d) In doubly reinforced sections

(i) amount of tensile reinforcement is doubled

(ii) number of shear stirrups is doubled

(iii) steel in compression zone is not provided

(iv) steel is provided in compression zone also.

(e) Overturning is considered in

(i) Limit state of collapse

(ii) Limit state of serviceability

(iii) both the above

(iv) none of the above

(f) Characteristic load is defined as the load that has a _____ percent probability of not being exceeded during the life of the structure.

(i) 5 (ii) 10 (iii) 90 (iv) 95

(g) For limit state of collapse, partial safety factors for concrete and steel, respectively, are

(i) 1.15 and 1.5

(ii) 1.15 and 3

(iii) 1.5 and 3

(iv) 1.5 and 1.15

2. (a) Explain, briefly, what are over reinforced sections. 7

(b) Compare stress - strain curves of mild steel and medium tensile steel. 7

3. (a) Check if the beam shown in Fig. 1 is under reinforced. 7

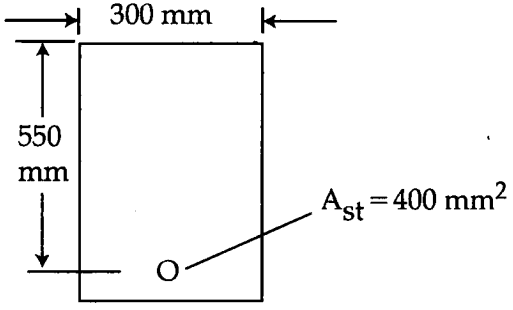

Fig. 1

Take f_y = 415 MPa and grade of concrete as M 20.

(b) What do you understand by diagonal tension ? What are its effects in RC beams ? 7

4. (a) Explain procedure of design of a one way RC slab. 7

(b) Discuss the role of cover - concrete in RC structures. 7

5. (a) How do you differentiate between short and long RC columns ? Which one may fail by buckling ? 7

(b) Write the assumptions taken in the design of RC beams. 7

6. (a) Describe one way and two way shear with the help of neat sketches. 7

(b) Discuss the significance of bond between concrete and steel in RC structures with examples. 7

7. Write short notes on *any two* of the following. **2x7=14**

(a) Working stress method

(b) Durability of concrete

(c) Fire resistance of concrete