

AR—2027

Faculty of Engineering & Technology

B.Arch. (Architecture) Fifth Semester (CGS) Examination

ARCHITECTURE STRUCTURE-IV

(10039)

Paper—5 AR 03

Sections—A & B

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
- (2) Answer **THREE** questions from Section A and **THREE** questions from Section B.
- (3) Due credit will be given to neatness and adequate dimensions.
- (4) Assume suitable data wherever necessary.
- (5) Illustrate your answers wherever necessary with the help of neat sketches.
- (6) I.S.I. Hand book for structural Steel section, I.S. Code 800/1962 or 1964, I.S. 456 (Revised) I.S. 875 may be consulted.
- (7) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION—A

1. Explain the composition of concrete with their significance. 13

OR

2. Explain the different types of cement and admixtures used at construction sites. 13
3. Enlist the types of bars used as reinforcement with their characteristic strength. Also state the way and purpose behind bending bars. 13

OR

4. Explain in brief "The suitability of steel as reinforcing material." 13
5. State the recommendations for permissible stress in steel as per IS 456. Also state the recommendations in IS 875 about live loads of floors and roofs. 13

OR

6. Discuss the use of IS 456 : 2000 code for RCC members in brief. 13

SECTION—B

7. Find area of steel required if a beam 250×500 mm carries a factored moment of 165 kN-m. Use M 15 grade of concrete and mild steel. 13

OR

8. What is Limit State Design? Elaborate the concept with role of factor of safety. 13
9. Design a slab panel covering area of $3.2 \text{ m} \times 6 \text{ m}$ supported on 230 mm brick wall subjected to a superimposed load of 2 kN/m^2 with floor finish of 0.5 kN/m^2 . Use M 20 and Fe415. 14

OR

10. Design an RCC column of unsupported length of 4.0 m with following particulars :
 Axial factored load = 3000 kN
 Grade of concrete = M 20
 Grade of steel = Fe 415 14
11. Design a dog-legged staircase for the public building from the below data :
 (i) Height between floors = 3.2 m
 (ii) Riser = 160 mm
 (iii) Trade = 270 mm
 (iv) Width of landing = 5 m
 (v) Floor finish = 0.6 kN/m^2
 Assume the landing of staircase to be supported on 230 mm thick brick wall at the outer edge of landing parallel to the riser. Use M 20 grade of concrete and Fe 415 steel. 14

OR

12. Design a column footing with the following data :
 (i) Column size = 400×300 mm
 (ii) Axial Load on column = 1100 kN
 (iii) SBC = 200 kN/m^2 .
 (iv) Use M 20 and Fe 500 14