

CBCS SCHEME

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15ENG15

First Semester B.Arch. Degree Examination, Jan./Feb. 2021 Building Structure – I

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, may be assumed suitably.

Module-1

- 1 a. Define structure, and explain load transfer mechanism from a structural element to the ground with sketches. (10 Marks)
b. Sketch and explain the following: i) Arch ii) Dome. (10 Marks)

OR

- 2 a. Explain the historical evolution of structures with sketches. (10 Marks)
b. Sketch and explain the following : i) Truss ii) Shell. (10 Marks)

Module-2

- 3 a. Explain the terms Modulus of Elasticity and Ductility with respect to structural steel. (10 Marks)
b. Explain with examples: i) Dead Load ii) Imposed load. (10 Marks)

OR

- 4 a. Write explanatory notes on Brick masonry and stone masonry. (10 Marks)
b. Explain with examples : i) Impact load ii) Thermal load. (10 Marks)

Module-3

- 5 a. Calculate the reactions at the supports for the beam shown in Fig Q5(a).

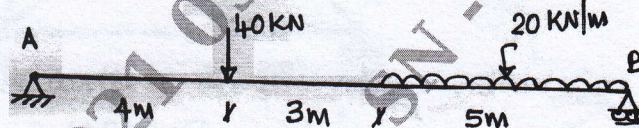


Fig Q5(a)

- b. Explain the concept of Tension and compression with neat sketches. (10 Marks)

OR

- 6 a. Calculate the resultant of the following force system. Shown in Fig Q6(a).

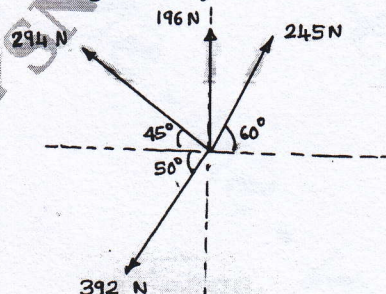


Fig Q6(a)

- b. State and explain the equations of Equilibrium of coplanar non-concurrent force system. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. A bar 2000mm long and 30mm in diameter is subjected to an axial pull of 30,000N. If the modulus of Elasticity of the material is $2 \times 10^5 \text{ N/mm}^2$. Calculate:
 i) Stress ii) Elongation of bar iii) Strain. (12 Marks)
 b. With a neat sketch explain coplanar concurrent force system and coplanar non-concurrent force system. (08 Marks)

OR

- 8 a. A bar of 30mm diameter is subjected to an axial pull of 60,000N. The measured elongation on a gauge length of 200mm is 0.09mm and change in dia is 0.0039mm. Calculate the elastic constants. (12 Marks)
 b. With neat sketches, explain Resultant Force and Equilibrant Force. (08 Marks)

Module-5

- 9 a. With usual notations $m = 2j - 3$, explain the terms perfect truss, Redundant truss and Deficient truss. (12 Marks)
 b. Sketch and explain any two truss configuration. (08 Marks)

OR

- 10 a. Explain the method of calculation of self weight of truss with a neat sketch. (10 Marks)
 b. Calculate the reactions at the supports for the truss shown in Fig Q10(b).

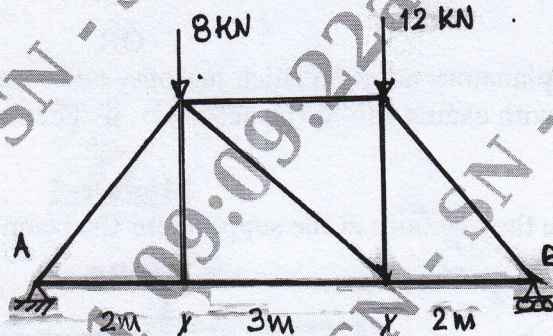


Fig Q10(b)

(10 Marks)
