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15ENG15

First Semester B.Arch. Degree Examination, July/August 2021

Building Structures – I

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions.

2. Missing data if any can be assumed suitably.

- 1 a. Define structures. Name and sketch some manmade and natural cantilever structures. (10 Marks)
 b. What are the different types of structural systems? Give examples. (10 Marks)
- 2 a. Write short note on: (i) Dome (ii) Vault (iii) Shell
(iv) Cable stayed (v) Membranes and net. (10 Marks)
 b. Explain the load path of any structures in details. (10 Marks)
- 3 a. Define dead load and live load with examples. (10 Marks)
 b. What are the advantages and disadvantages of wood, steel, concrete, masonry structures? (10 Marks)
- 4 a. Briefly explain tall buildings and long span buildings. (10 Marks)
 b. What are the ingredients used in plain concrete? Indicate the properties of the ingredient. (10 Marks)
- 5 a. Determine the magnitude and direction of resultant force from the Fig. Q5 (a).

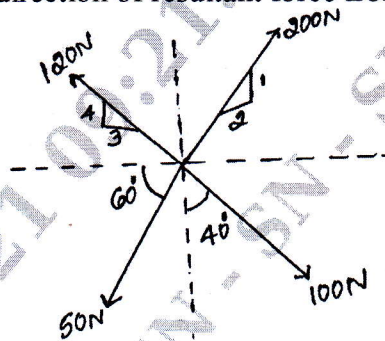


Fig. Q5 (a)

(10 Marks)

- b. Explain the concept of compression, tension, bending and torsion with sketches. (10 Marks)

- 6 a. What are the different types of supports? Explain with neat sketches. (08 Marks)
 b. Calculate reactions at support A and B for the beam shown in Fig. Q6 (b).

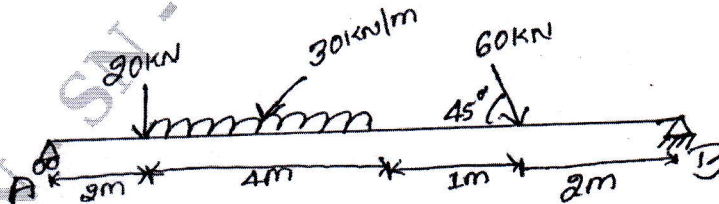


Fig. Q6 (b)

(12 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.

- 7 a. Explain Hooke's law. Derive the equation $\Delta L = \frac{PL}{AE}$. (10 Marks)
- b. A Prismatic bar of cross section of 25 mm × 50 mm is stretched by 1.5 mm due to axial pull 90 KN. Length of the bar is 2 m. Calculate stress, strain and modulus of elasticity. (07 Marks)
- c. Explain resultant of forces. (03 Marks)
- 8 a. With the help of neat sketch draw stress-strain graph of mild steel specimen under tension indicate all the important points. (08 Marks)
- b. Find the resultant of system of coplanar forces acting on a lamina as showing Fig.Q8 (b). Each square has a side of 10 mm.

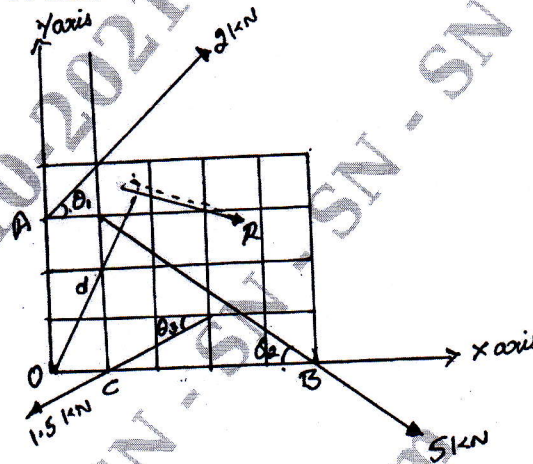


Fig. Q8 (b)

(12 Marks)

- 9 a. List any five common types of trusses with neat sketches. (10 Marks)
- b. Determine the reactions at the support A and D for the truss shown in Fig. Q9 (b).

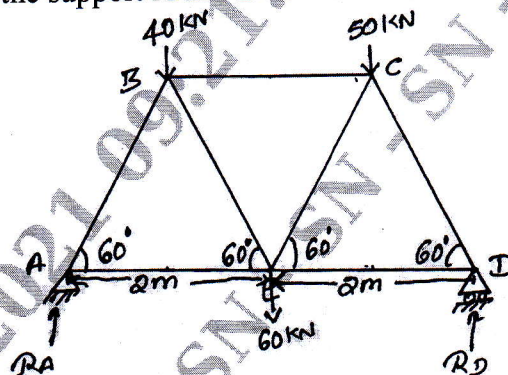


Fig. Q9 (b)

(10 Marks)

- 10 Explain the methods used to analyze the trusses. (20 Marks)
