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First Semester B.Arch. Degree Examination, July/August 2022 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List and explain the properties of concrete and steel. Giving emphasis on structural properties. (10 Marks)
- b. List the tests conducted on fresh concrete. Explain any one in detail. (10 Marks)

OR

- 2 a. List and explain different types of loads as per IS-875 code. (10 Marks)
- b. Write short notes on the following construction materials. i) Steel ii) Aluminium
iii) Wood iv) Glass. (10 Marks)

Module-2

- 3 a. State and explain principle of transmissibility and parallelogram law of forces. (10 Marks)
- b. Define force and state its characteristics, explain different types of force systems with neat sketches. (10 Marks)

OR

- 4 a. Compute the resultant of the forces shown in Fig Q4(a)

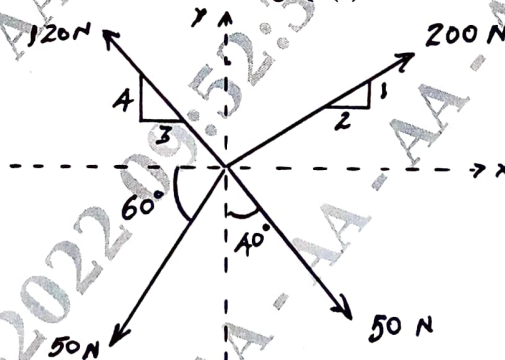


Fig Q4(a)

(10 Marks)

- b. Three forces acting on a hook are as shown in FigQ4(b), determine the direction of the fourth force of magnitude 100N such that the hook is pulled in 'x', direction only. Determine the resultant force in 'x' direction.

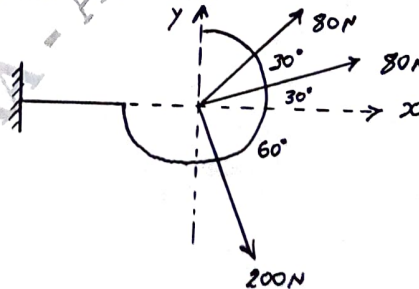


Fig Q4(b)

(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-3

- 5 a. List the different types of loads, beams and supports with neat sketches. (10 Marks)
 b. Define couple and list the characteristics of A couple. (05 Marks)
 c. Explain statically determinate and statically indeterminate beams. (05 Marks)

OR

- 6 a. Determine the magnitude, direction of the resultant force for the force system, shown in Fig Q6(a). Locate the resultant force with respect to point 'D'.

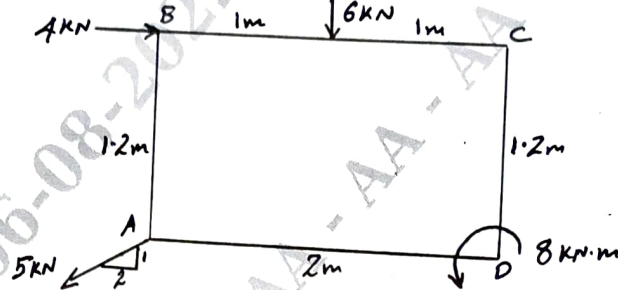


Fig Q6(a)

- b. Determine the support reactions of the overhanging beam shown in Fig Q6(b). (10 Marks)

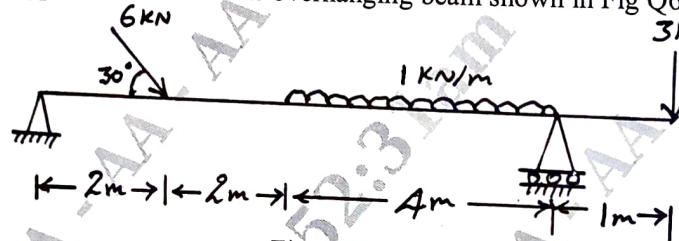


Fig Q6(b)

(10 Marks)

Module-4

- 7 a. Locate the centroid of the shaded area shown in Fig Q7(a).

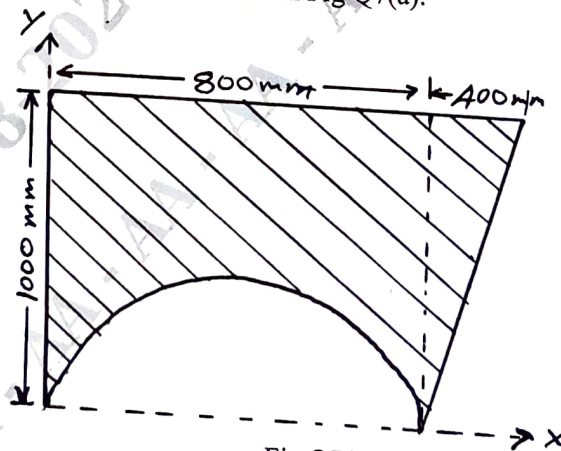


Fig Q7(a)

(10 Marks)

- b. Locate centroid of lamina shown in Fig Q7(b) with respect point A.

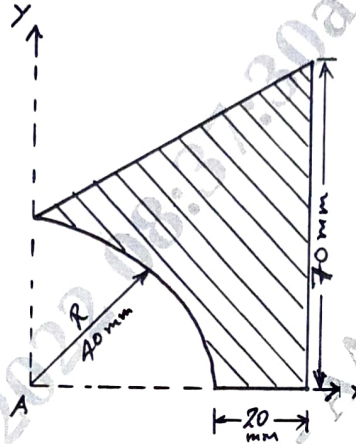


Fig Q7(b)

(10 Marks)

OR

- 8 a. State and prove parallel and perpendicular axis theorem. (10 Marks)
 b. Find the M.I of a concrete beam section shown in Fig Q8(b) about horizontal and vertical axis passing through the centroid.

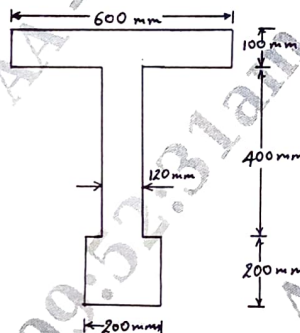


Fig Q8(b)

(10 Marks)

Module-5

- 9 a. Write a note about triangulation concept. List and explain the different types of trusses. (10 Marks)
 b. Find the forces in all the members of the truss shown in Fig Q9(b).

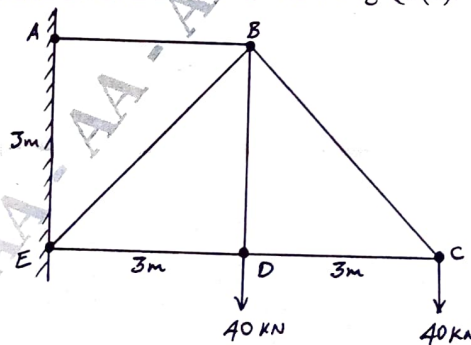


Fig Q9(b)

(10 Marks)

OR

- 10 a. List the assumptions made in analysis of truss. (05 Marks)
 b. Determine the forces in all the members of the truss shown in Fig Q10(b). All inclined members are at 60° to horizontal and length of each member is 2m.

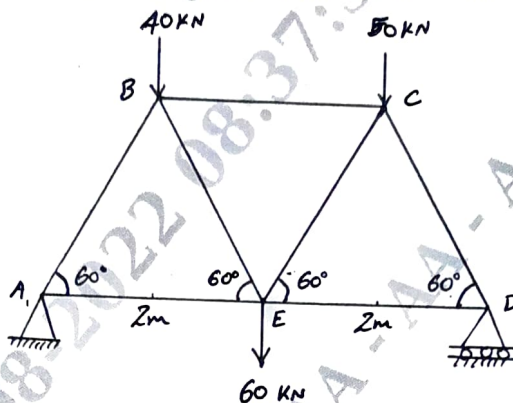


Fig Q10(b)

(15 Marks)
