

First Semester B.Arch. Degree Examination, Dec.2019/Jan.2020 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What is concrete? What are the factors affecting strength of the concrete? Explain briefly. (10 Marks)
- b. What are the types of steel used in the construction? Explain any one experiment which determines the quality of the steel. (10 Marks)

OR

- 2 a. Explain the different types of loads considered using the design of buildings according to IS-875 code. Also give different load combination for design. (10 Marks)
- b. Explain important properties of wood and aluminium. (10 Marks)

Module-2

- 3 a. Differentiate between determinate and indeterminate structures with examples. (06 Marks)
- b. Draw neat sketches of different types of supports with reactions. (04 Marks)
- c. Determine the magnitude, direction and location of resultant force for the coplanar non concurrent force system shown in Fig. Q3 (c) with respect to "O". (10 Marks)

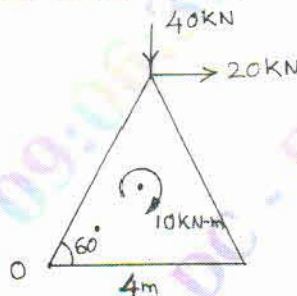


Fig. Q3 (c)

OR

- 4 a. What is free body diagram? Draw neat sketches. (05 Marks)
- b. Define : (i) Resultant (ii) Equilibrant
- (iii) Moment (iv) Principles of transmissibility (05 Marks)
- c. Determine magnitude and inclination of resultant of coplanar concurrent force system shown in Fig. Q4 (c). (10 Marks)

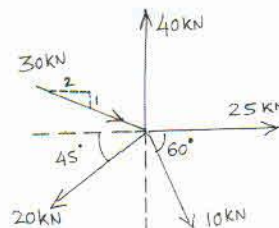


Fig. Q4 (c)

Module-3

- 5 a. Explain complete coplanar force system with sketches. (10 Marks)
 b. Define couple and characteristics of couple. (05 Marks)
 c. Determine support reaction for the beam shown in Fig. Q5 (c). (05 Marks)



Fig. Q5 (c)

OR

- 6 a. Determine vertical and horizontal reaction at 'A' also moment at 'A' for the cantilever beam shown in Fig. Q6 (a). (10 Marks)

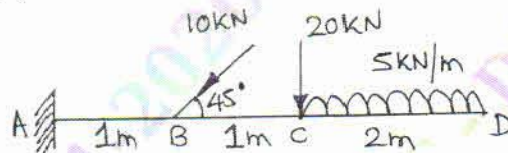


Fig. Q6 (a)

- b. Determine reactions at the supports for the simply supported beam shown in Fig. Q6 (b). (10 Marks)

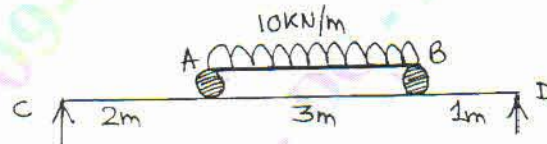


Fig. Q6 (b)

Module-4

- 7 a. Define centroid, centre of gravity, radius of gyration and parallel axis theorem. (04 Marks)
 b. Write moment of inertia expressions for rectangular, circular, triangle and semicircular sections about horizontal centroidal axis. (04 Marks)
 c. Determine centroid of the shaded portion shown in Fig. Q7 (c) with respect to "O". (12 Marks)

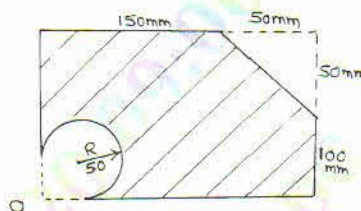


Fig. Q7 (c)

OR

- 8 a. Determine radius of gyration about centroidal axis for the shown in Fig. Q8 (a). (08 Marks)

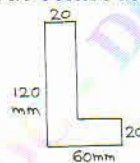


Fig. Q8 (a)

- b. Determine M.I. about horizontal centroidal axis for the Fig. Q8 (b). (12 Marks)

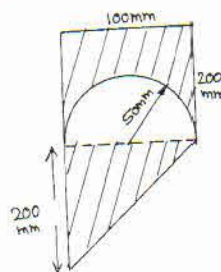


Fig. Q8 (b)

Module-5

- 9 a. What are the assumptions made in the analysis of trusses? (05 Marks)
 b. Determine reactions for the truss shown in Fig. Q9 (b). (05 Marks)

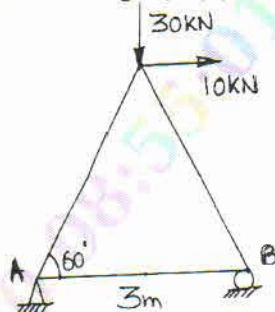


Fig. Q9 (b)

- c. Analyse the truss shown in Fig. Q9 (c) by method of joint. (10 Marks)

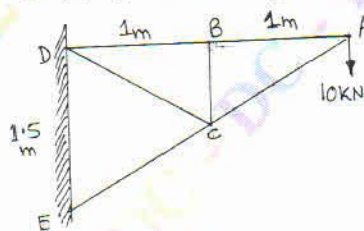


Fig. Q9 (c)

OR

- 10 a. Explain with sketches the types of trusses. (06 Marks)
 b. Analyse the truss shown in Fig. Q10 (b) by method of joint. Also calculate the dead load of the truss, if each member consists of 2ISA 50×50×5 mm at $(2 \times 3.8\text{kg/m})$. (14 Marks)

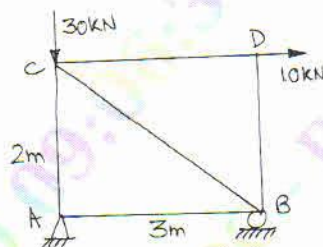


Fig. Q10 (b)
