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First Semester B. Arch Degree Examination, June/July 2015

Building Structures - I

Time: 4 hrs.

Max. Marks:100

- Note:** 1. Answer any FIVE full questions, selecting ONE full question from each part.
2. Missing data, if any, may be assumed suitably.

PART 1

- 1 a. Explain with neat sketch the classification of structural elements based on geometry and stiffness. (10 Marks)
b. Draw and describe the properties of arch. Indicate load path. (10 Marks)

OR

- 2 a. Explain the resistance mode for any five structural system with neat sketch. (10 Marks)
b. Write short note on:
i) Vault ii) Dome iii) Shell iv) Cable stayed v) membrane & net. (10 Marks)

PART 2

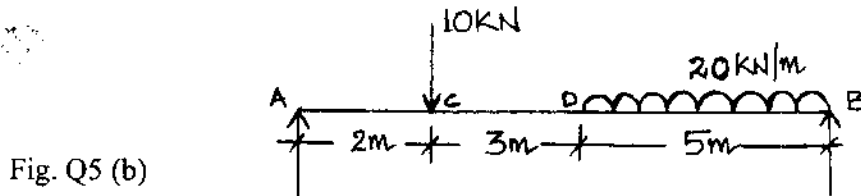
- 3 a. Explain masonry and fabric structure with manmade example. (08 Marks)
b. List the advantages and disadvantages of structural materials wood, concrete and steel. (12 Marks)

OR

- 4 a. Explain the following briefly. (12 Marks)
i) Dead load ii) Live load iii) Gravity load iv) Lateral load.
b. Calculate the dead load of a RCC beam of size 23×30 cm, length of beam is 5m. Unit weight of R.C.C beam is given by 2400Kg/m^3 . (08 Marks)

PART 3

- 5 a. Describe load path and tributary load. Explain the mechanism of load transfer. (10 Marks)
b. Find the reactions at support for the following beam shown in Fig. 5(b).



(10 Marks)

OR

- 6 a. What is free body diagram? Write at least 2 cases to show FBD is useful. (08 Marks)
b. Draw and describe the following : compression, tension, bending, torsion, shear. (12 Marks)

PART 4

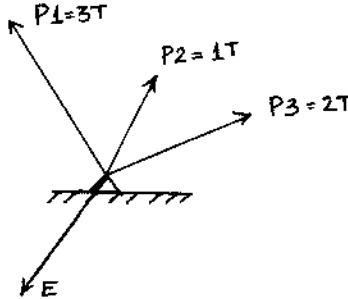
- 7 a. With the help of neat sketch explain the stress strain relationship for mild steel specimen. (10 Marks)

- b. Find compressive stress for a square column of $100\text{mm} \times 100\text{mm}$ cross section and a load of $70T$. (04 Marks)
- c. Find the elongation caused by a tensile force of 600 kN in a steel member 2500mm long having a cross section area of 500mm^2 with $E = 204000\text{ N/mm}^2$. (06 Marks)

OR

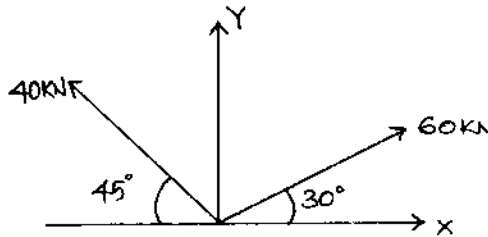
- 8 a. Find resultant E shown in Fig. Q8 (a) by graphic method. (08 Marks)

Fig. Q8 (a)



- b. Determine the components on the x and y axis of a force of 10kN that acts at an angle of 60° . (04 Marks)
- c. Show the resultant force in magnitude and direction for the force shown in Fig. 8 (c).

Fig. Q8 (c)



(08 Marks)

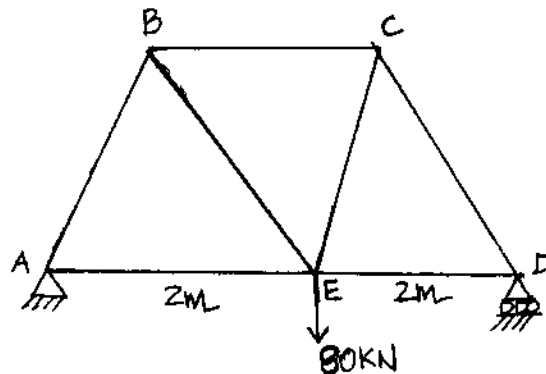
PART 5

- 9 a. Explain geometric stability of truss with neat sketch. (10 Marks)
- b. List any 5 common types of trusses with a neat sketch. (10 Marks)

OR

- 10 a. Explain graphic method in analysis of truss. (10 Marks)
- b. Determine the support reaction of the truss shown in Fig. Q10 (b).

Fig. Q10 (b)



(10 Marks)
