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14ENG1.5

**First Semester B.Arch. Degree Examination, Dec.2014/Jan.2015**  
**Building Structures – I**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, choosing ONE question from each part.**  
**2. Missing data may be suitably assumed and clearly stated.**

**Part – 1**

- 1 a. Explain evolution of structures with respect to historical perspective and present developments. (10 Marks)
- b. Explain load path and load transfer with suitable examples for a natural structure and a man made structure. (10 Marks)
- 2 a. Explain vertical structural system and lateral structural system with suitable examples. (10 Marks)
- b. Explain shear walls, with relevant sketches. (10 Marks)

**Part – 2**

- 3 Explain the choice of structural material for domestic buildings, industrial buildings, tall buildings and long span buildings. (20 Marks)
- 4 Write short notes with examples:
  - a. Live load and Dead load. (05 Marks)
  - b. Static load and Dynamic load. (05 Marks)
  - c. Wind load and Seismic load. (05 Marks)
  - d. Impact load and Thermal load. (05 Marks)

**Part – 3**

- 5 a. Explain mechanism of load transfer with respect to load flow by tributary load and load path. (10 Marks)
- b. Find the support reaction, at C and D for the structure shown in Fig. Q5 (b). (10 Marks)

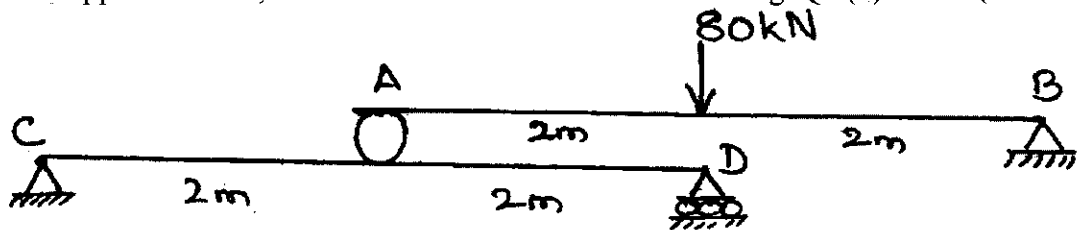


Fig. Q5 (b)

- 6 Differentiate:
  - a. Load, reaction and moment. (10 Marks)
  - b. Compression, Tension and Torsion. (10 Marks)

**Part – 4**

- 7 a. With the help of neat sketch, explain the stress strain relationship for mild steel specimen. (08 Marks)
- b. A tension test is conducted on a steel rod of gauge length 55 mm and diameter 10 mm. The rod during the test elongates to 80 mm. A maximum load of 80 kN may be applied on the rod but it yields at 35 kN and finally breaks at 40 kN. Find the following parameters:
- The yield strength.
  - The ultimate strength.
  - The strength at the point of failure.
  - The actual strength at the point of failure, when the local diameter is reduced to 5 mm.
  - The percentage elongation.
  - The percentage reduction in area, where necking occurs. (12 Marks)
- 8 a. State parallelogram law of forces and explain. (04 Marks)
- b. State polygon law of forces and explain. (04 Marks)
- c. A system of four forces acting at a point on a body is as shown in Fig. Q8 (c). Determine the resultant. (12 Marks)

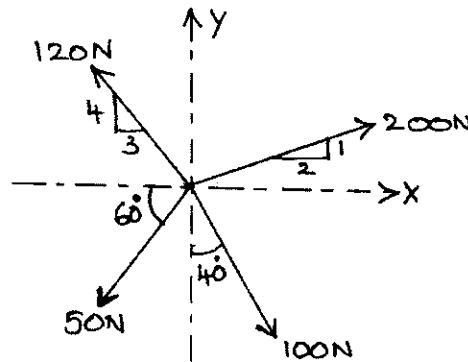


Fig. Q8 (c)

**Part – 5**

- 9 a. Explain graphic method in analysis of truss. (10 Marks)
- b. Find the support reactions for the truss shown in Fig.Q 9(b) using graphic method of analysis. (10 Marks)

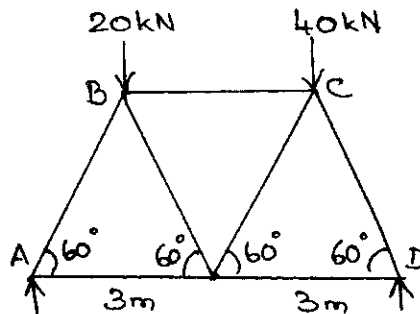


Fig. Q9 (b)

- 10 a. Explain the concept of triangulation with relevant sketches. (10 Marks)
- b. Explain the common truss configurations with relevant sketches. (10 Marks)

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