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14ENG1.5

First Semester B.Arch. Degree Examination, Dec.2015/Jan.2016
Building Structures – I

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE questions, choosing ONE full question from each module.
2. Missing data may be assumed suitably.

Module - 1

- 1 Explain different types of structural systems and types of structural elements with neat sketches. (20 Marks)
- 2 Draw & describe the structural principles of a typical building in relation to ground of your own choice & show the load path and load transfer. (20 Marks)

Module - 2

- 3 What are the different types of structural materials? Explain its mechanical properties, advantages and disadvantages of structural materials. (20 Marks)
- 4 Explain the different types of loads with neat sketches and example. (20 Marks)

Module - 3

- 5 a. What are different types of supports and principle of support conditions? What are the equations of static equilibrium? (10 Marks)
- b. Find the reactions of support for the following beam shown in Fig.Q5(b) (10 Marks)

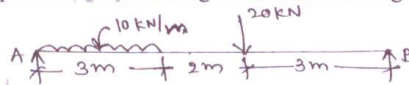


Fig.Q5(b)

- 6 a. Define the terms Tension, compression, shear, bending torsion, stress with its symbols and notations. (12 Marks)
- b. Find the compressive stress for a column of c/s (i) 230×450 mm (ii) 200×200 mm for a load of 500 kN. (08 Marks)

Module - 4

- 7 a. Explain the stress-strain relationship for mild steel specimen. (10 Marks)
- b. Find the tensile stress and elongation caused by tensile force of 100 kN in a steel member 3.5 m long having a cross-section area of 1000 mm² with $E = 2.1 \times 10^5 \text{ N/mm}^2$. (10 Marks)
- 8 a. Determine the resultant of given force system shown in Fig.Q8(a). (15 Marks)

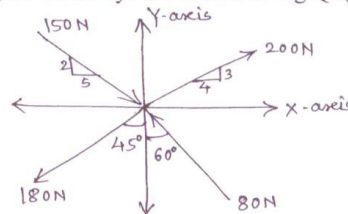
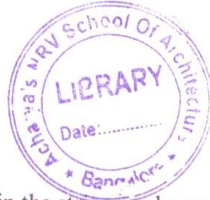


Fig.Q8(a)

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.



14ENG1.5

- b. The X-component of tension 'T' in the string as shown in Fig.Q8(b) is 600 N. Determine the actual force and its Y-component. (05 Marks)

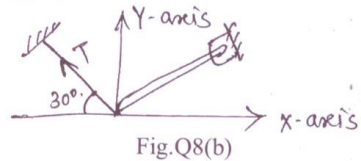


Fig.Q8(b)

Module - 5

- 9 a. Explain graphic method in analysis of truss. (10 Marks)
b. Explain common truss configuration with neat sketches. (10 Marks)
- 10 Find the self weight or dead load of the truss shown in Fig.Q10 and support reactions for self weight using ISA 75×75×10 (wt. per meter 11 kg/m) as truss members; the truss span is 8 m with 6 divisions and height 3 m. (20 Marks)

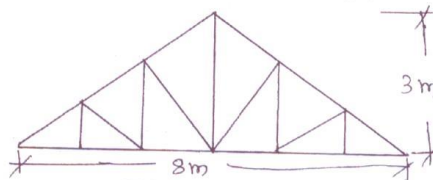


Fig.Q10
