No. of Printed Pages : 3

BAR-014

BACHELOR OF ARCHITECTURE (B ARCH)

00551

Term-End Examination

December, 2013

BAR-014 : THEORY OF STRUCTURES - II

Time : 3 hours *Maximum Marks : 70*

Note : *Question No. 1 is **compulsory**. Attempt **any four** questions from the remaining questions. Use of scientific calculator is **permitted**.*

1. Choose the most appropriate answer from the options given in questions (a) to (g) below. **2x7=14**

   (a) 'King post' is the name of

   (i) a rigid frame

   (ii) an arch

   (iii) a truss

   (iv) a column

   (b) Pin jointed truss shown in Fig 1 is

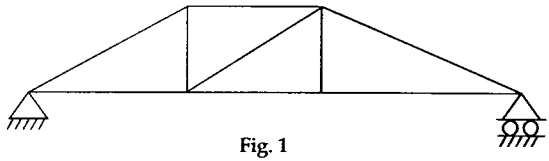

Fig. 1

   (i) determinate

   (ii) indeterminate

   (iii) unstable

   (iv) externally redundant

(c) A support which can not bear a horizontal load is
   (i) fixed support
   (ii) pin support
   (iii) hinged support
   (iv) roller support

(d) In a pin jointed truss, areas are divided in the shape of triangles because :
   (i) triangles look good
   (ii) triangular shape is a stable shape
   (iii) of convention of its use for a long time
   (iv) law of triangle of forces has to be applied to the truss

(e) Example of an elastic material is/are
   (i) stone (ii) steel
   (iii) brick (iv) steel and brick

(f) For a plane structure, a fixed support can have, at the most
   (i) 2 reactions (ii) 3 reactions
   (iii) 6 reactions (iv) 9 reactions

(g) Which of the shapes has its centre of gravity most uniformly placed ?
   (i) square (ii) circle
   (iii) rectangle (iv) triangle

2. (a) What do you understand, by a 'simply supported beam'? What difference would be created to the beam if one of the supports is changed by a fixed support ? 7

   (b) Describe how an arch transfers loading effects towards its supports. 7

3. (a) What do you understand by Young's modulus of elasticity ? 7

   (b) Draw a strain - stress curve for mild steel and describe it briefly. 7

4. (a) Draw SFD and BMD for the structure shown in Fig 2. 7

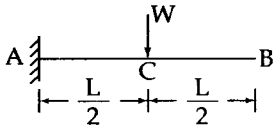

Fig. 2

EI is constant for the cantilever beam.

(b) Explain why strong and stable foundations are needed for structures. 7

5. (a) Describe a simple geometrical form and its structural behaviour. 7

(b) Explain the parallel axis theorem involved in the calculation of moment of inertia. 7

6. (a) Why rigid frames are so called ? Discuss briefly. 7

(b) What shall be the effect on forces in members of a pin jointed truss if joints of the truss are welded ? 7

7. Write short notes on *any two*. 2x7=14

(a) Brittle materials

(b) Arches and domes

(c) Hooke's law