No. of Printed Pages : 4

BAR-014

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

00392

December, 2016

BAR-014 : THEORY OF STRUCTURES – II

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Answer any **four** questions from the remaining questions. Use of calculator is permitted.*

1. Choose the most appropriate answer from the options given in questions (a) to (g) below. *7×2=14*

(a) The number of reactions which can be produced at a fixed support in a plane structure are

(i) 2

(ii) 3

(iii) 4

(iv) 6

(b) The material of a structure should be

(i) strong

(ii) ductile

(iii) durable

(iv) All of the above

(c) Which of the following is a three-dimensional element ?

(i) Arch

(ii) Dome

(iii) Beam

(iv) Bearing wall

(d) For normal static dead loads, which of the structural elements would be subjected to axial thrust ?

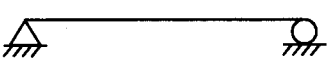
(i) Beam

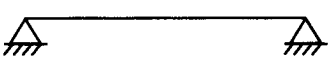
(ii) Arch

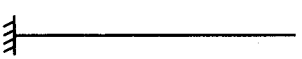
(iii) Lintel

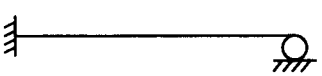
(iv) All of the above

(e) Which of the following is an example of a simply supported beam ?

(i) 

(ii) 

(iii) 

(iv) 

(f) For static gravity loads, the bending moment would, in the case of a cantilever, be

(i) zero at the hinged support

(ii) zero at the fixed support

(iii) zero at the free end

(iv) zero somewhere but its location cannot be specified in a general sense

(g) Young's modulus of elasticity relates stress and

(i) bearing capacity

(ii) ductility

(iii) strength

(iv) strain

2. (a) Write any four qualities of a structural material. Explain the importance of any one of these qualities. 7

(b) What do you understand by a stable structure ? Draw a neat sketch of a stable structure and show the various types of reactions at the location of supports due to external loads applied on the structure. 7

3. (a) A simply supported beam of span 'L' is supporting a concentrated load 'W' at mid span. Calculate the intensity of a UDL of length 'L' which, if applied in place of W, would produce the same bending moment at the centre of beam span. 7

(b) Draw a neat sketch of an arch with appropriate types of supports. 7

4. (a) Discuss various characteristics of plane pin jointed trusses of steel. 7

(b) Discuss how structural behaviour of two beams — one very stiff and the other one flexible — would be different when same external forces are applied on them. Support conditions for both may be taken to be the same. 7

5. (a) Explain how forces are transferred in an arch with a neat sketch. 7

(b) Provide sketches of any two simple geometric forms of structures. 7

6. (a) Draw shear force diagram for a simply supported beam of span 'L' loaded with a point load 'P' at mid span. 7

(b) What is meant by a layout of a building structural system ? Explain. 7

7. Write short notes on any ***two*** of the following topics : *2×7=14*

(a) Lintel

(b) Consideration of safety in buildings

(c) Poisson's ratio