

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

June, 2016

00348

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. $7 \times 2 = 14$

- (a) A roller support develops
- (i) a horizontal reaction
 - (ii) a vertical reaction
 - (iii) a moment
 - (iv) All the above

- (b) Percentage expansion in a bar in respect to its original length on application of axial forces is termed as
- (i) Stress
 - (ii) Ductility
 - (iii) Young's modulus
 - (iv) Strain
- (c) What types of structural elements out of those given below, were used in ancient buildings ?
- (i) Steel trusses
 - (ii) Rigid concrete frames
 - (iii) Concrete beams
 - (iv) Arches
- (d) Which of the following materials is ductile ?
- (i) Glass
 - (ii) Brick
 - (iii) Stone
 - (iv) Steel
- (e) Which of the following is a 3-D representation of an arch ?
- (i) Beam
 - (ii) Fixed support
 - (iii) Dome
 - (iv) Truss

(f) A simply supported beam of span 'L' is subjected to a uniformly distributed load of intensity 'w' throughout its span length. Vertical reaction at any of its supports is given as

(i) wL

(ii) $\frac{wL^2}{2}$

(iii) $\frac{wL}{2}$

(iv) $\frac{wL^2}{8}$

(g) A beam section is subjected to

(i) Shear force

(ii) Bending moment

(iii) Both the above

(iv) None of the above

2. (a) An arch is provided with a roller and a hinged support respectively at its two ends. Describe how the arch would be different from a simply supported beam in terms of the load transfer mechanism. 7

(b) What do you understand by stress ? Discuss briefly. 7

3. (a) Explain the various characteristics of a pin-jointed truss. 7
- (b) What is a bearing wall system ? Describe with the help of a neat sketch. 7
4. (a) Draw the shear force diagram for a simply supported beam subjected to a UDL of intensity 'p' over its full length which is 'L'. 7
- (b) Discuss why stiffness is a desired quality of a lintel. 7
5. (a) Compare the working aspects of a fixed support to those of a hinged one. 7
- (b) What do you understand by a rigid frame ? Explain with a neat sketch. 7
6. (a) What are simple geometric forms ? Give some examples. 7
- (b) Write and explain some advantages of symmetrical layouts of structural systems in buildings. 7
7. Write short notes on any *two* of the following topics : $2 \times 7 = 14$
- (a) Cuboidal and Prismatic Forms
- (b) Desired Qualities of Structural Materials
- (c) Foundations of Buildings
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