

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

December, 2017

00382

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 scientific calculator is permitted.

1. Choose the most appropriate answer from the options given in questions (a) to (g) below : $7 \times 2 = 14$
- (a) Maximum bending moment in a beam occurs when
- (i) Shear force is minimum
 - (ii) Deflection is minimum
 - (iii) Shear force is maximum
 - (iv) Deflection is maximum
- (b) A propped cantilever has
- (i) both ends fixed
 - (ii) one end fixed and the other free
 - (iii) one end fixed and the other with a roller support
 - (iv) one end hinged and the other with a roller support

- (c) A simply supported beam of length 'L' is subjected to a UDL of intensity 'w' per unit length over its whole span. Shear force near the support will be
- (i) $\frac{wL^2}{2}$
 - (ii) $\frac{wL}{2}$
 - (iii) wL
 - (iv) None of these
- (d) Building element used for vertical transportation is
- (i) Column
 - (ii) Window
 - (iii) Staircase
 - (iv) None of these
- (e) Method of joints may be applied for the analysis of trusses having
- (i) Welded Joints
 - (ii) Pinned Joints
 - (iii) Rigid Joints
 - (iv) None of these
- (f) A structure should have
- (i) stability
 - (ii) stiffness
 - (iii) strength
 - (iv) All of these

- (g) Beams in a building generally require _____ reinforcement as compared to arches.
- (i) more
 - (ii) less
 - (iii) equal
 - (iv) None of these
2. (a) Discuss two important considerations in the construction of bearing wall systems in view of structural safety. 7
- (b) Discuss various functions of columns for the construction of a building. 7
3. (a) Discuss locations where lintels are provided. Explain the precautions to be taken for the construction of lintels. 7
- (b) Define simple geometric forms. Discuss the salient properties of these briefly. 7
4. (a) Explain the role of foundation for a structure. Discuss various factors for the selection of foundation for general building. 7
- (b) Differentiate between a Pin-jointed truss and a Welded joint truss in terms of the load transfer mechanism of these trusses. 7

5. Write short notes on any *two* of the following : $2 \times 7 = 14$
- (a) Behaviour of Brick Masonry Arch
 - (b) Stress – Strain Characteristic of Medium Tensile Steel
 - (c) Cuboidal and Prismatic Forms
6. (a) Define ductile and brittle materials used for the construction of a building. Explain the utility of ductile materials. 7
- (b) Enlist components of a reinforced concrete framed system. Briefly describe the role of any one of these components. 7
7. (a) Discuss why transverse reinforcement is provided in a beam of an RC framed building. 7
- (b) Describe some advantages of indeterminate structures over determinate ones. 7
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