

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

December, 2017

00442

BAR-004 : THEORY OF STRUCTURES – I

Time : 3 hours

Maximum Marks : 70

Note : Question no. 1 is **compulsory**. Answer any **four** questions from the remaining part.

1. Choose the most appropriate answer from the options given in questions (a) to (g) below. $7 \times 2 = 14$
- (a) Which of the following supports gives the maximum number of reactions ?
- (i) Fixed
 - (ii) Hinged
 - (iii) Roller
 - (iv) Number of reactions is same for all
- (b) A member of length 'L' expands by ΔL . The strain is
- (i) $(L + \Delta L)/L$
 - (ii) $(L - \Delta L)/L$
 - (iii) $(L - \Delta L)/\Delta L$
 - (iv) $\Delta L/L$

- (c) Which of the following loads may *not* be permanent in nature ?
- (i) Dead load
 - (ii) Live load
 - (iii) Wind load
 - (iv) Live load and wind load
- (d) Choose the strongest material.
- (i) Stone
 - (ii) Brick
 - (iii) Soil
 - (iv) Steel
- (e) Strains and stresses inside structural members are
- (i) related to each other
 - (ii) not related
 - (iii) never related
 - (iv) seldom related
- (f) Displacements in a stiff structure would be
- (i) small
 - (ii) large
 - (iii) very large
 - (iv) infinite

- (g) First priority for a structure is
- (i) safety
 - (ii) economy
 - (iii) both safety and economy
 - (iv) strength
2. (a) Draw a neat sketch of stress – strain curve for mild steel and write a brief note about it. 7
- (b) Describe Hooke's law briefly. 7
3. (a) Discuss how wind force acts on buildings. 7
- (b) What do you understand by dead loads ? Discuss briefly. 7
4. (a) Draw a neat sketch of a plane pin-jointed truss. 7
- (b) What do you mean by 'Design' of structures ? Explain briefly. 7
5. (a) What is meant by 'Function of a structure' ? Classify structures based on function. 7
- (b) Explain why adequate factor of safety is needed in the design of structures. 7
6. (a) What are primary elements of structures ? Describe briefly. 7
- (b) What do you understand by model testing ? Is it important for building structures ? Discuss briefly. 7

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

(a) Forces of Nature

(b) Effect of Strength on Performance of Structures

(c) Natural and Man-made Forms
