

BACHELOR OF ARCHITECTURE (B.ARCH)

Term-End Examination

June, 2014

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 questions.

1. Choose the most appropriate answer from the options given in questions (a) to (g) below : **7x2=14**
- (a) The necessary condition for equilibrium of body is :
- (i) $\Sigma V = 0$ (ii) $\Sigma H = 0$
(iii) $\Sigma M = 0$ (iv) All of the above
- (b) In a plane structure, a roller support has number of reaction equal to :
- (i) 2 (ii) 3
(iii) 1 (iv) None of these
- (c) Modulus of rupture is a measure of :
- (i) Direct tensile strength
(ii) Direct compressive strength
(iii) Flexural tensile strength
(iv) None of the above

- (d) The effective length of a column depends upon :
 - (i) supports conditions
 - (ii) un-supported length
 - (iii) both the above
 - (iv) none of these
 - (e) A propped cantilever has :
 - (i) one end hinged and other roller support
 - (ii) one end fixed and other free
 - (iii) both ends fixed
 - (iv) one end fixed and other having a roller support
 - (f) Live loads :
 - (i) do not change their position
 - (ii) are normally taken to be wind loads
 - (iii) change their position frequently
 - (iv) none of the above
 - (g) Structure should have :
 - (i) stiffness (ii) stability
 - (iii) strength (iv) all of the above
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- 2. (a) Explain wind loads. How are they different from gravity loads ? 7
 - (b) Explain relation between stress and strain. Discuss a procedure to obtain this relation. 7
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- 3. (a) Draw a neat sketch of a roller support. Discuss its characteristics. 7
 - (b) What do you understand by a theoretical model of a structure ? What should be its characteristics ? 7

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| 4. | (a) | Define Factor of Safety. Explain its role in the analysis of a structure. | 7 |
| | (b) | Define bending stresses. Discuss their occurrence in a structure. | 7 |
| 5. | (a) | Explain briefly how stability of a structure can be checked. | 7 |
| | (b) | Discuss factors affecting strength in a structure. | 7 |
| 6. | (a) | What are primary elements ? What should be the required behaviour of two primary elements in a typical structure ? | 7 |
| | (b) | Define stiffness. Discuss its importance in a structure. | 7 |
| 7. | (a) | Explain the mechanism of transfer of loads in a structure towards the foundation. | 7 |
| | (b) | What are the objectives of analysis of structures ? Enlist steps of analysing a structure. | 7 |
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