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BAR-004

BACHELOR OF ARCHITECTURE

Term-End Examination

June, 2010

00409

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). **7x2=14**
- (a) Due to wind loads, a building may :
- (i) slide
 - (ii) overturn
 - (iii) overturn as well as slide
 - (iv) no effect
- (b) Young's modulus is given as :
- (i) lateral stress/lateral strain
 - (ii) lateral stress/longitudinal strain
 - (iii) longitudinal stress/longitudinal strain.
 - (iv) longitudinal stress/lateral strain
- (c) Out of the following materials which one is the ductile material ?
Brick, stone, steel, Glass
- (i) steel
 - (ii) brick
 - (iii) glass
 - (iv) stone

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- (d) The number of reactions at a fixed support in a plane structure are :
- (i) 4
 - (ii) 6
 - (iii) 2
 - (iv) 3
- (e) In a pin jointed truss, forces are applied :
- (i) at the joints
 - (ii) at the middle of members
 - (iii) at the quarter span of a member
 - (iv) at joints as well as at the middle of the members
- (f) A structure should be :
- (i) stable
 - (ii) safe
 - (iii) economical
 - (iv) all of the above
- (g) Out of the following, which one is a time dependent phenomenon ?
- (i) elastic deformation
 - (ii) creep deformation
 - (iii) temperature strain
 - (iv) none of the above
2. (a) Explain how a fixed support is different from a hinged support ? 7
- (b) What do you understand by yield point ? 7
Explain with the help of stress-strain curve of mild steel.
3. (a) What do you understand by Dead Loads and live loads ? Explain with examples. 7

- (b) What are the effects of temperature variations on materials used in buildings ? Explain taking example of a truss with hinged supports on both ends. 7
4. (a) What are various functions of any structural frame work ? Describe with the help of neat sketches. 7
- (b) Why analysis of forces is important for a structural framework ? Discuss it with reference to a communication tower. 7
5. (a) What do you understand by 'factor of safety' ? Describe the factors affecting it. 7
- (b) What do you understand by stiffness ? How is it related to strength ? 7
6. (a) Explain the likely effects of wind forces on a high rise building. How can such a building be made safer against wind ? 7
- (b) What do you understand by 'design of structures' ? What considerations are important for it ? Discuss briefly. 7
7. Write short note on *any two* of the following : $2 \times 7 = 14$
- (a) Forces of nature
- (b) Stability of structures
- (c) Types of stresses