

## BACHELOR OF ARCHITECTURE

Term-End Examination

December, 2011

00162

### BAR-014 : THEORY OF STRUCTURES - II

Time : 3 hours

Maximum Marks : 70

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**Note :** Question No. 1 is *compulsory*. Answer *any four* questions from the remaining questions. Use of scientific calculator is *permitted*.

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1. Choose the most appropriate answer from the options given in questions (a) to (g). 7x2=14
- (a) Resultant support reaction for gravity loads may be inclined for :
- (i) a beam
  - (ii) an arch
  - (iii) a column
  - (iv) none of the above
- (b) Forces acting parallel to a cross section in a beam are :
- (i) axial forces
  - (ii) bending moments
  - (iii) shear forces
  - (iv) none of the above

- (c) Force of friction is affected by :
- (i) type of surfaces in contact
  - (ii) weight of object
  - (iii) all the above
  - (iv) none of the above
- (d) Longitudinal strain, in terms of change in length ( $\Delta L$ ) and original length ( $L$ ) may be given as :
- (i)  $L/\Delta L$
  - (ii)  $\Delta L/(L + \Delta L)$
  - (iii)  $\Delta L/L$
  - (iv)  $(L + \Delta L)/(L - \Delta L)$
- (e) BMD for a simply supported beam due to a UDL over its full span is :
- (i) parabolic in shape
  - (ii) rectangular
  - (iii) triangular
  - (iv) trapezoidal
- (f) In an internal pin introduced in a beam :
- (i) shear force is zero
  - (ii) bending moment is zero
  - (iii) SF and BM both are zero
  - (iv) none of the above

- (g) Normally wind load applies on a building :
- (i) in a horizontal direction
  - (ii) vertically
  - (iii) inclined at an angle of  $60^\circ$  from the ground
  - (iv) either vertically or inclined

2. (a) Explain how arches are different from beams. 7
- (b) Determine the resultant of the force system shown in Fig. 1 7

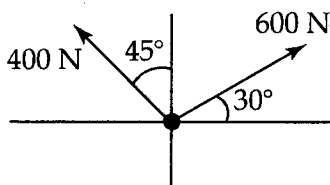


Fig. 1

3. (a) Explain how dead loads are transferred to foundations in an RCC frame consisting of beams and columns. 7
- (b) Explain the law of triangle of forces. 7
4. (a) Draw BMD and SFD for the beam, shown in Fig. 2. 7

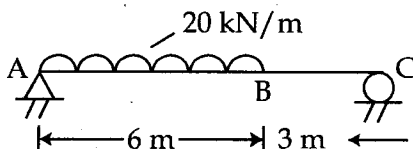


Fig. 2

- (b) Discuss the characteristics of a fixed support briefly. 7

5. (a) What do you understand by 'Polar moment of inertia' ? Write the parallel axis theorem. 7

- (b) Calculate external reactions at support points C and E in the truss, shown in Fig. 3 7

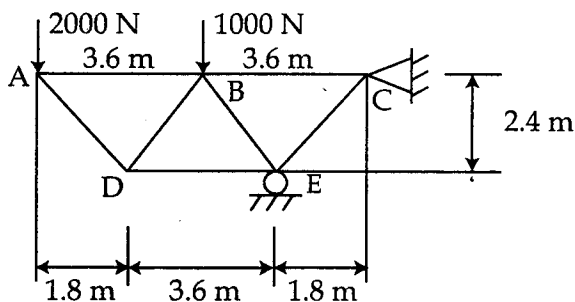


Fig. 3

(The truss is pin jointed.)

6. (a) What do you understand by centre of gravity of an area ? How do you calculate it ? 7

- (b) Determine the moment of inertia of the figure, shown in Fig. 4, about a horizontal axis, passing through the centre of gravity of the area. 7

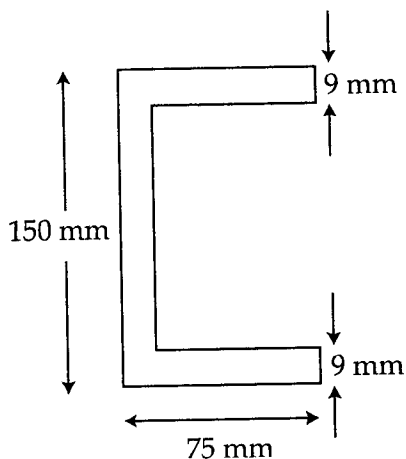


Fig. 4

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

- (a) Friction
- (b) Cuboidal forms
- (c) Asymmetrical layouts

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