No. of Printed Pages : 3

**BAR-024**

00682

# BACHELOR OF ARCHITECTURE

## Term-End Examination

## December, 2011

## BAR-024 : THEORY OF STRUCTURE - III

*Time : 3 hours* *Maximum Marks : 70*

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

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**1.** Choose the most appropriate option in each of the following questions : **7x2=14**

(a) Equal and opposite forces applied to a bar tend to elongate it. The stress, so produced in it, is called _____ stress.
(shear/tensile/transverse)

(b) For a cantilever with uniformly distributed load of W kN over its entire length L, the maximum bending moment will be equal to _____.

$\left(\frac{WL}{2}/WL/2WL\right)$

(c) The bending moment on a section is maximum where shearing force _____.
(is maximum/ is minimum/ changes sign)

(d) A long vertical member subjected to an axial compressive load is called a _____.
(Stanchion/tie/column)

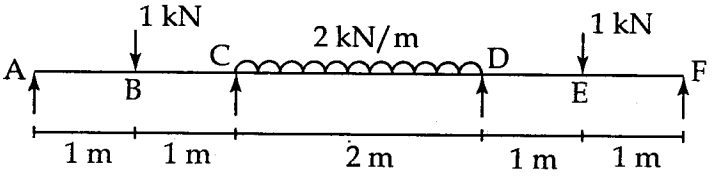
(e) The reaction at the supports will be perpendicular to the plane of the support, if the frame structure rests on a _____ support.
(roller/ hinged/ fixed)

(f) The centre of gravity of a homogeneous body is the point at which the whole _____ of the body is assumed to be concentrated.
(volume/ area/ weight)

(g) MI of a square of side b about an axis through its CG is equal to _____.

$\left(\frac{b^4}{12} / \frac{b^4}{8} / \frac{b^4}{4}\right)$

2. (a) Draw the SFD and BMD for the beam shown below : 7




(b) Differentiate between movable and immovable hinged support. 7

3. (a) Derive relation between BM and SF. 7

(b) Discuss statically determinate and Indeterminate trusses. 7

4. (a) Prove that the CG of a triangular plate must lie at the intersection of the medians. 7

(b) State the three equilibrium conditions for a column. Explain the factors on which the ultimate compressive load for a column depends. 7

5. (a) Determine the MI of an I shaped area about its centroidal axis as shown in Figure 1. (dimensions are in mm) 7

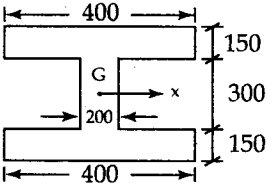



Figure.1

(b) Explain the properties of influence lines. 7

6. (a) Explain the necessity of the study of deflection in a beam. Write down its importance with regard to safety of beam. 7

(b) Discuss the uses and advantages of composite sections. 7

7. Write short notes on ***any four*** of the followings : **4x3½=14**

(a) Permissible stresses in compression members.

(b) Encased columns

(c) Resolution and composition of forces

(d) Moment of coplanar forces

(e) Static equilibrium conditions.