No. of Printed Pages : **4**

BAR-024

00425

BACHELOR OF ARCHITECTURE

Term-End Examination

June, 2012

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 calculator is **permitted**.*

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

(a) For a simply supported beam with central load, the BM will be maximum at the _____.

(supports / centre / $1/4^{th}$ of the span)

(b) For a simply supported beam carrying udl of WkN on its entire length L, the maximum BM will be equal to _____.

$$\left(\frac{WL}{4} \;/\; \frac{WL}{6} \;/\; \frac{WL}{8}\right)$$

(c) If a beam of unifom section is subjected throughout its length to a uniform bending moment, it will bend to a _____ arc. (parabolic / circular / semi-parabolic)

(d) In a three hinged arch, the BM will be zero at _____.

(right hinge / left hinge / all the three hinges)

(e) Ties are load carrying members of a frame, which are subjected to axial _____ loads. (tension / compression / torsinal)

(f) The CG of a quadrant of a circle lies along its central radius at a distance of _____ R. (0.2 / 0.4 / 0.6)

(g) MI of a triangular section (base b, height h) about an axis through its CG and parallel to the base is _____.

$\left(\frac{bh^3}{36} / \frac{bh^3}{12} / \frac{bh^3}{4}\right)$

2. (a) Draw the SFD and BMD for the beam shown in Figure 1. 7

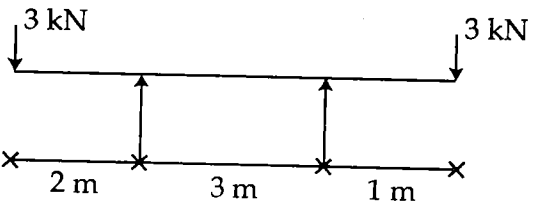

Figure - 1

(b) Differentiate between a point load and a distributed load. 7

3. (a) Explain law of parallelogram of forces. 7

(b) What do you understand by truss analysis ? Explain the assumptions on which the primary analysis of a plane truss is based. 7

4. (a) Explain the concept of CG. Specify its uses in engineering applications. 7

(b) What do you understand by effective length of a column ? How can it affect the ultimate load for a long column ? 7

5. (a) Determine the MI of a T shaped area about its centroidal axis as shown in Figure 2 (dimensions are in mm). 7

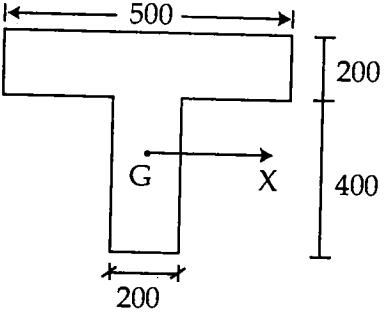

Figure - 2

(b) State various empirical formulae for estimating the buckling load of columns. 7

6. (a) Discuss horizontal shear stress and its variations across a cross section of a beam. 7

(b) State the assumptions made in the theory of composite sections. 7

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

(a) Compound columns.

(b) Coplanar forces.

(c) Properties of couples.

(d) Pure bending stress.

(e) Short and long column.