

JK Lakshmipat University, Jaipur

Institute of Engineering and Technology

End Term – Examination

B.Tech.[2nd YEAR]/[3rd Sem.]/[2013-14]

Course Name: STRENGTH OF MATERIALS & MECHANICS OF STRUCTURES

Course Code: CE301

Max Marks: 40

Time: 03.00 hr

Instructions:

1. Attempt all sections.

Section A

Q.1. Attempt all five questions. Each question carry equal marks.

(5 MARKS)

(a) The deformation per unit length is called

- (i) tensile stress (ii) compressive stress (iii) shear stress (iv) strain

(b) Hook's law holds good up to

- (i) yield point (ii) elastic limit (iii) plastic limit (iv) breaking point

(c) A beam which is fixed at one end and free at the other is called

- (i) simply supported beam (ii) fixed beam
(iii) overhanging beam (iv) cantilever beam

(d) The bending moment on a section is maximum where shear force is

- (i) minimum (ii) maximum (iii) changing sign (iv) zero

(e) Bending moment diagram for a cantilever beam loaded with uniformly distributed load will be a parabolic curve.

- (i) Correct (ii) Incorrect

Q.2 Write short on the following ?

(5 MARKS)

(a) Explain theory of simple bending with its assumptions?

(b) Explain theorem of perpendicular and parallel axis?

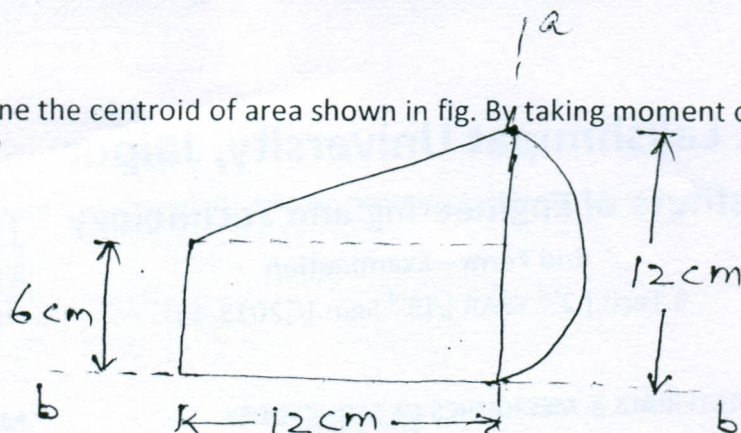
Section B

Note :- Attempt any four question? Each question carry equal marks?

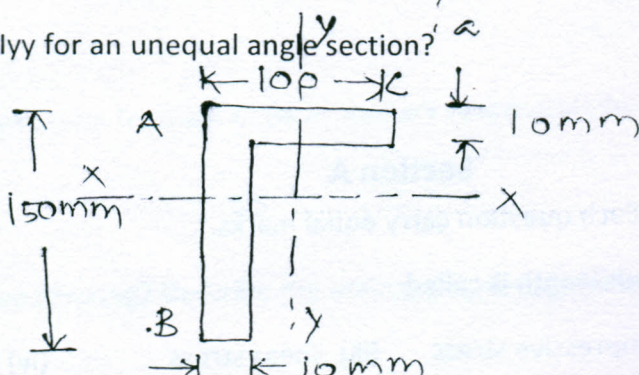
Q.3 Define Stress and Strain ? Also explain the relationship between stress – strain for mild steel by stress – strain relationship curve in detail ? State the Hooke's Law ?

(5 MARKS)

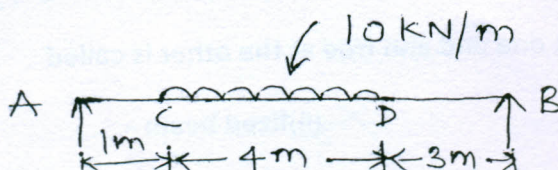
Q.4 Determine the centroid of area shown in fig. By taking moment of area about the given a-a axis and b-b axis? (5 MARKS)



Q.5 Find I_{xx} and I_{yy} for an unequal angle section? (5 MARKS)



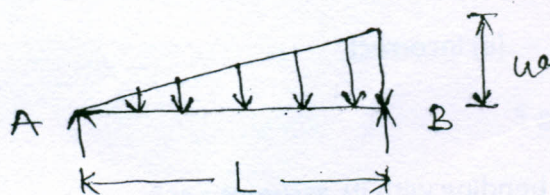
Q.6 Draw the S.F.D. and B.M.D. for a simply supported beam of length 8m and carrying a U.D.L. of 10kN for distance of 4m as shown in fig. (5 MARKS)



Q.7 A steel plate of width 120mm and of thickness 20mm is bent into a circular arc of radius 10m. Determine the max. stress induced and the bending moment which will produce the max. stress. Take $E = 2 \times 10^5 \text{ N/mm}^2$.

Section C (Compulsory to attempt internal choice)

Q.8 Derive an expression for the shear force and bending moment diagram for a simply supported beam carrying a uniformly varying load from zero at one end to w per unit length at the free end? (10 MARKS)



OR

Q.8 A member ABC is formed by connecting a steel bar of 20mm diameter to an aluminium bar of 30mm diameter and is subjected to forces as shown in fig. Determine the total deformation of the bar, taking E for aluminium as $0.7 \times 10^5 \text{ N/mm}^2$ and that for steel as $2 \times 10^5 \text{ N/mm}^2$. (10 MARKS)

