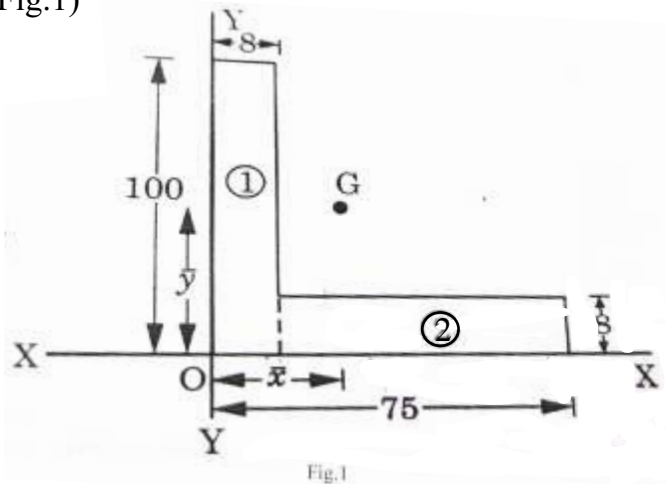


- Q.34 Write the steps followed for analysis of truss by joint method.
- Q.35 Define and explain the term: Perfect frame and deficient frame.

SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)
- Q.36 A beam AB 10 m long has supports at its ends A and B. it carries a point load 5 kN at 3 m from A and a point of 5kN at 7 m from A and a U.D.L. of 1 kN/m between the point loads. Draw the shear force and bending moment diagrams.
- Q.37 A steel plate of width 60 mm and of thickness 10 mm is bent into a circular arc of radius 10 m. Determine the maximum stress induced and the bending moment which will produce the maximum stress. Take $E = 2 \times 10^5 \text{ N/mm}^2$.
- Q.38 Find the position of centroid of an unequal angle section 100 mm x 75 mm x 8 mm with its longer leg vertical. (Fig.1)



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4th Sem / Arch Subject:- Structural Mechanics

Time : 3Hrs.

M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

- Q.1 Force is measured by product of
a) Mass and velocity
b) Weight and acceleration
c) Mass and acceleration
d) Momentum and velocity
- Q.2 A single force can be balanced by
a) Two force of equal magnitude
b) A single force of equal magnitude and in opposite direction.
c) Cannot be balanced at all
d) None of the above
- Q.3 Centroid of a triangle lies at the point of intersection of
a) Altitude b) Medians
c) Bisector of angles d) Diagonals
- Q.4 The modulus of elasticity is expected to have higher value for
a) Copper b) Brass
c) Steel d) Aluminum
- Q.5 The point of contraflexure occurs in case of
a) Cantilevers only
b) Continuous beams
c) Overhanging beams only
d) all types of beam

- Q.6 A simply supported beam of length L carrying a load W concentrated at the centre of span will have a maximum bending moment of
- a) $WL/8$ b) $WL/2$
 c) $WL/16$ d) $WL/4$
- Q.7 Which of the following are statically indeterminate beams?
- a) Fixed beams b) Continuous beams
 c) Both (a) and (b) d) Cantilevers
- Q.8 When a beam is subjected to a bending moment the strain in a layer is _____ the distance from the neutral axis.
- a) Directly proportional to
 b) Inversely proportional to
 c) Equal to
 d) Independent of
- Q.9 The section modulus of a rectangular section about an axis through its C.G. is
- a) $b/2$ b) $bd^2/2$
 c) $d/2$ d) $bd^2/6$
- Q.10 For a perfect frame, the relation between number of joints 'j' and number of members 'n' is
- a) $n = 2j$ b) $n - 3 = 2j$
 c) $n > 2j - 3$ d) $n = 2j - 3$

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

- Q.11 Force has _____ as well as _____
- Q.12 Two equal and unlike parallel forces having different lines of action constitute a _____
- Q.13 The _____ affect of a force is called moment.
- Q.14 Effect of tensile force is to _____ the length of the body.

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- Q.15 The positive bending moment is also called _____
- Q.16 B.M. is _____ at a section where S.F. is zero after changing its sign.
- Q.17 A beam whose both ends are fixed is known as _____
- Q.18 The bending stress on the neutral axis is _____
- Q.19 Moment of resistance = _____ x section modulus.
- Q.20 The member subjected to compression is called a _____

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 State polygon law of forces with neat sketches.
- Q.22 Define force. Write characteristics of a force. What are the effects of force?
- Q.23 Describe Varignon's theorem of moments.
- Q.24 State perpendicular axis theorem.
- Q.25 Define moment of inertia and write moment of inertia of rectangular section.
- Q.26 Define stress. Write its S.I unit. Name different types of stresses.
- Q.27 Define volumetric strain and shear strain.
- Q.28 Define Point load, uniformly distributed load and uniformly varying load.
- Q.29 Explain different type of support with help of neat sketch.
- Q.30 Give sign convention for Shear force in general with diagram.
- Q.31 Draw the S.F. and B.M diagrams for a simply supported beam carrying a point load W at its mid span.
- Q.32 What are the assumptions made in the theory of simple bending?
- Q.33 What do you understand by neutral axis and moment of resistance?

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