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4th Sem / Civil

Subject:- Structural Mechanics

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 A material which can be drawn into wires without rupture is called

a) Ductile Material b) Brittle Material
c) Malleable Material d) All the above

Q.2 The unit of strain is

a) N/cm b) N/mm
c) mm d) No unit

Q.3 At the point contra flexure

a) B.M is minimum
b) B.M is maximum
c) B.M is either zero or change sign
d) All the above

Q.4 The unit of moment in inertia

a) L b) L^2
c) L^3 d) L□

Q.5 Neutral axis of a beam is the axis of

a) Zero stress b) Maximum stress
c) Negative stress d) Positive stress

Q.6 Shear stress at a section in beam varies along

a) Depth b) width
c) Perimeter d) None of these

Q.29 Draw the stress -strain diagram of Mild Steel.

Q.30 What do you mean by Composite Section.

Q.31 Draw the detail shear stress distribution diagram for a circular section.

Q.32 What is necessity for calculating deflection for a beam.

Q.33 Write the classification of column.

Q.34 Define type of frame

Q.35 What is the relation between Elastic constant.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 A bar 300 mm long is 50 mm x 50 mm in section for 120 mm of its length, 20 mm diameter for 80 mm of length and 40 mm diameter for remaining length. If the tensile force of 80 kN is applied to the bar, calculate the stresses induced in the different sections and total elongations of the bar. Take E = $2x10^{Ù}5N/mm^2$.

Q.37 Explain the different type of beams along with their neat sketches.

Q.38 A simply supported beam is carrying a UDL of 2.5 KN/m over a length of 2.5 m from the right end. The length of the beam of 5m, Draw the S.F & B.M diagram for the beam.

Q.7 The load at which the column just buckle is known as
a) critical load b) Buckling load
c) Crippling load d) All the above

Q.8 Effective length of column with both end fixed is given by
a) L b) L/2
c) 2L d) None of these

Q.9 A column whose slenderness ratio is greater than 120 is known as
a) Short Column b) Long Column
c) Medium Column d) Composite4 Column

Q.10 If n=2J -3 than the frame is named as
a) Perfect frame b) Deficient frame
c) Redundant frame d) None of these

SECTION-B

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

Q.11 Define Elasticity.

Q.12 Example of Brittle Material

Q.13 Define Stress

Q.14 Define Bending Moment.

Q.15 Unit of section modulus_____.

Q.16 Neutral axis of a section always passes through its _____

Q.17 Moment of resistance = _____ x section modulus.

Q.18 Define shear stress in beam.

Q.19 Euler's formula is applicable for_____ column only.

Q.20 A frame in which number of member more than (2J-3) is called _____ Frame

SECTION-C

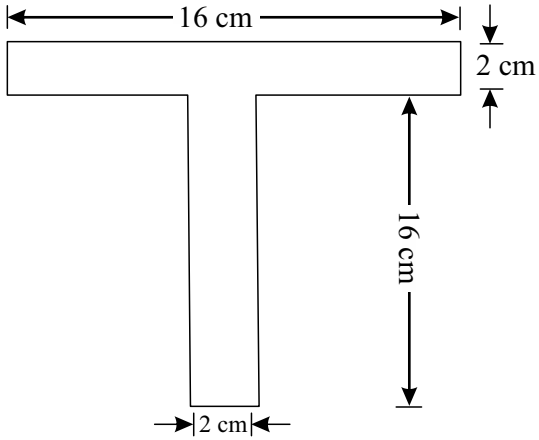
Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define mechanical properties of material

Q.22 Explain types of load.

Q.23 Draw the SFD & BMD for a cantilever beam carrying UDL over the whole span.

Q.24 Find the moment of inertia of T section as show in Fig. About X-X and Y-Y axis passing through the centroid of the section



Q.25 Write the assumption made in the theory of simple bending.

Q.26 Define & Explain Hook's Law.

Q.27 Define Theorem of parallel Axis.

Q.28 A rectangular beam 300 mm deep is simply supported over a span of 4m. What UDL per metre the beam may carry, if the bending stress is not to exceed 120 N/mm². Take I=8x10Ù6mm □