Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

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CE-305-CBGS

B.Tech., III Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Strength of Materials

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five question from given eight questions.

ii) All questions carry equal marks.

iii)In case of any doubt or dispute the English version question should be treated as final.

1. a) Give stress-strain diagram for elastic body (under Tensile load) and also explain it's various points upto failure of a body.

b) Explain following terms:
   i) Mohr's circle
   ii) Principle planes and principal stresses

i)

ii)

2. a) Deduce on expression for equation of pure bending with it's all assumptions.

b) Explain following terms.

i) Neutral axis

ii) Shear stress distribution across a beam (Rectangular)

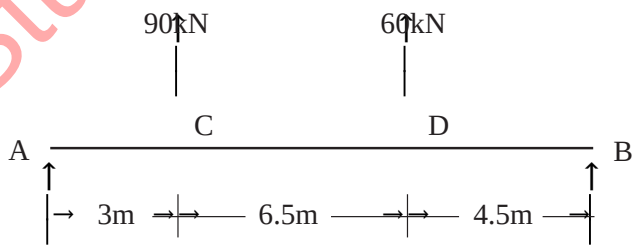
i)

ii) Shear stress

3. A steel girder of uniform section, 14 meters long is simply supported at its ends. It carries concentrated loads of 90 kN and 60kN at two points 3m and 4m from the two ends respectively. Calculate the deflection of the girder at the points under the two loads by the use of any method.

14

3m 4m



4. a) Explain following terms
   i) Slenderness ratio
   ii) Circumferential stresses

   i)

   ii)

   b) List out various theories of failure and also explain any one in detail.

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5. What do you understand by pure Torsion? Also deduce its expression at pure Torsion equation.

6. Define following terms.
   a) Shear centre
   b) Curved beam
   c) Unsymmetrical bending
   d) Euler’s formula

7. a) Deduce an expression for effective length of a column whose one end is fixed and other is free.

H$m°

b) A solid round bar 60 mm in dia and 2.5 m long is used as a strut. one end of the strut is fixed while its other end is hinged. Find the safe compressive load, for this strut using Euler's formula. Assume E = 2×10^5 N/mm^2 and f.o.s.=3.

60 mm dia a

E = 2×10^5 N/mm^2 and f.o.s.=3

8. Define any four from given below.
   i) Hook's Law
   ii) Temperature stresses
   iii) Castigliano's theorem
   iv) Bulk modulus
   v) Poisson's ratio

i)

ii)

iii)

iv)

v)

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