ROLL NO.	

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 80 | Max Time: 120 Mins | Weightage: 40 %

ENDTERM FINAL EXAMINATION

I Semester AY 2017-18 | Course: **CIV 201 STRENGTH OF MATERIALS** | 18 DECEM 2017

Instructions:

i. Write legibly

ii. Scientific and non programmable calculators are permitted

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Part A

[4 Q x 5 M= 20 Marks]

1. Differentiate between long columns, intermediate columns and short columns based on slenderness ratio

2. List five assumptions made in theory of pure torsion.

3. Differentiate between section Modulus and Polar Modulus with necessary equations

4. Explain Principal planes and stresses in case of strained element of a loaded structure

Part B

[2 Q x 15 M= 30 Marks]

5a. Derive the Bending equation $M/I = E/R = \sigma_b / Y$

5b. A Solid round bar 3m long and 5omm in diameter is used as a strut . Determine the crippling load for the given end conditions. Take $E = 2.0 \times 10^5$ N/mm^2.

a. Both the ends hinged

b. Both the ends of the struts fixed

c. One end fixed and other end hinged

d. One end of the strut fixed and other end free

Also find the safe load in each of the above cases using a factor safety of 3.

6a. Draw the shear stress distribution across a rectangular section subjected to sheer force of F.

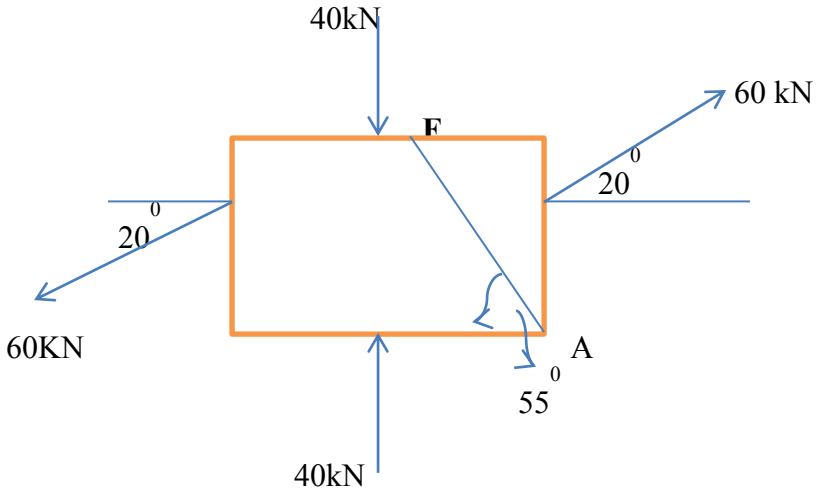
6**b.** A simply supported beam of span 1.3m having a cross section 150mm by 250mm deep carries a point load W at the Centre**.** The permissible stress are 7N/mm^2 in bending and 1 N/mm^2 in shearing. Calculate safe load W.

Part C

[2 Q x 15M= 30 Marks]

7a. With neat diagram Explain the concept of 'Mohr's Circle'

7b. The state of stress at a point in an elastic material is shown in Figure shown. Find the resultant Stress and its inclination on a plane AF inclined at 55^0 to the horizontal



8. A cast iron beam is of T-section. The flange has dimensions of 100mm x 20mm ,and the web is 80mm x 20mm. The beam is simply supported on a span of 8m. The beam carries a uniformly distributed load of 1.5kN/m length on the entire span. Determine the maximum tensile and maximum compressive stress

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Max Marks: 40 | Max Time:60Mins | Weightage: 20 %

TEST 2

I Semester AY 2017-2018 | Course: **CIV 201 Strength of Materials** | 27 OCT 2017

Instructions:

i. Write legibly
ii. Scientific and non-programmable calculators are permitted

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Part A

(3Q x 3 M= 09 Marks)

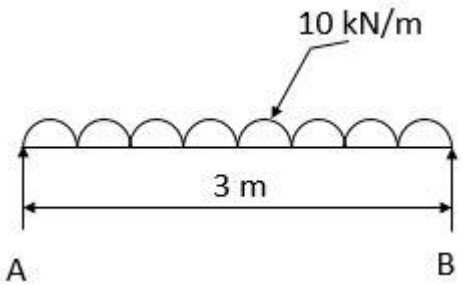
1 . Explain the terms

a. Shear force and shear force diagrams
b. Bending Moment and Bending Moment diagrams
c. Relationship between load intensity, shear force and Bending Moment

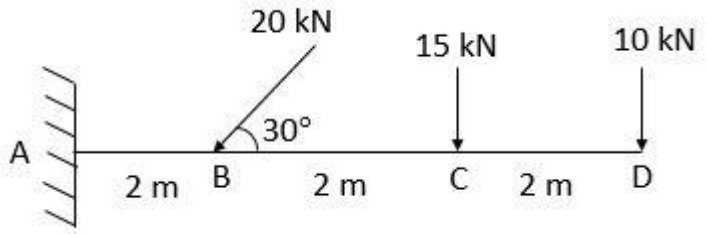
Part B

(2Q x 8M =16 marks)

2. Draw the Shear force and Bending moment diagrms for the simply supported Beam subjected to uniformly distributed load shown in figure and find Maximum Bending Moment.



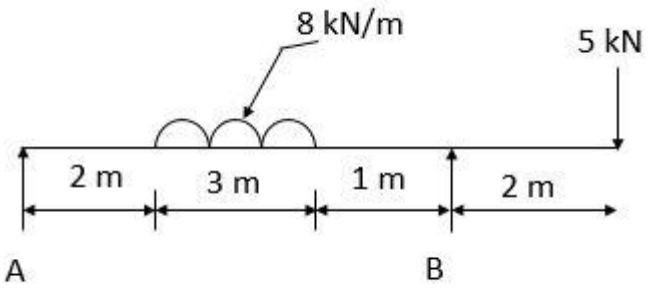
3. Draw the Shear force and Bending moment for the cantilever beam loaded as showing in the figure and find the Maximum shear force.



Part C

(1 Q x 15 M= 15Marks)

4. Draw SFD and BMD for the single overhang beam loaded shown in the figure and locate point of contra flexure if any



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 40 | Max Time: 60 Mins | Weightage: 20 %

TEST 1

I Semester 2017-2018 | Course: **CIV 201 Strength of Materials** | 16 SEPT 2017

Instructions:

i. Write legibly
ii. Scientific and non-programmable calculators are permitted
iii. Assume the appropriate values of the constants if required

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Part A

(3Q x 3 M= 09 Marks)

1. A rod is 2m long at a temperature of 10 degree centigrade. Find the expansion of the rod when the Temperature is raised to 80 degree centigrade. If the Expansion is prevented, find the stress induced in the material of the rod. Take E =1 x 10^5 N/mm^2 and coefficient of thermal expansion α=0.0000 12 per degree centigrade

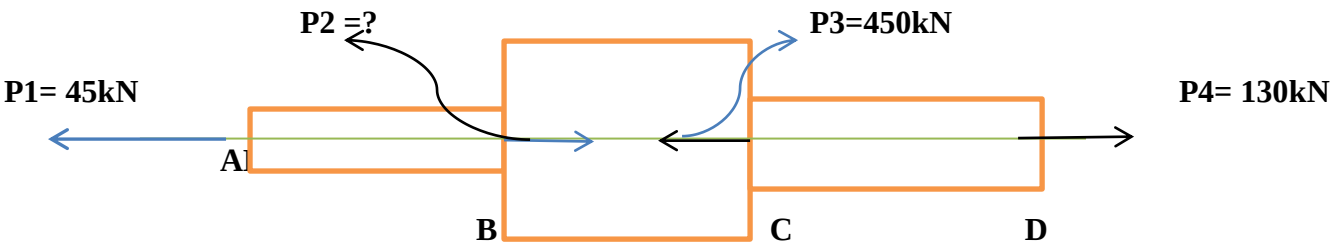
2. Draw the stress and strain curve for behavior of a mild steel specimen subjected to tension test and name the salient points of the stress strain curve

3. Define Hookes Law and Elastic limit

Part B

(2 Q x 8 M= 16 Marks)

4. A member ABCD is subjected to point loads as shown in the figure **Q4 Fig(1)**. Calculate the unknown force $\mathbf{P_2}$ necessary for the equilibrium. Determine the total elongation of the bar assuming E=2.1 x 10^5 N/mm^2 .Given that $\mathbf{L_{AB}}$ **=1200mm** $\mathbf{L_{BC}}$ **= 600mm** $\mathbf{L_{CD}}$ **=900mm**
$\mathbf{A_{AB}}$ **=625mm^2** $\mathbf{A_{BC}}$ **= 2500mm^2** $\mathbf{A_{CD}}$ **=1250mm^2**



Q4 Fig(1).

5. Explain with a neat sketch the temperature stress equations for the compound bar.

Part C

(1 Q x 15 M= 15Marks)

6 A Bar of cross section 8mm x 8mm is subjected to an axial pull of 7000N. The lateral dimension of bar is found to be changed to 7.9985 mm x 7.9985mm. If the Modulus of Rigidity of the material is 0.8×10^5 MPa , determine the Poisson's Ratio, Modulus of Elasticity and Bulk Modulus.