

Code No: R22012

R10

SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2018
STRENGTH OF MATERIALS
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. An overhanging beam ABC is loaded as shown in Figure 1. Find the slopes over (15M)  
each support and at the right end. Find also the maximum upward deflection  
between the supports and the deflection at the right end. Take  $E = 2 \times 10^5 \text{ N/mm}^2$   
and  $I = 5 \times 10^8 \text{ mm}^4$

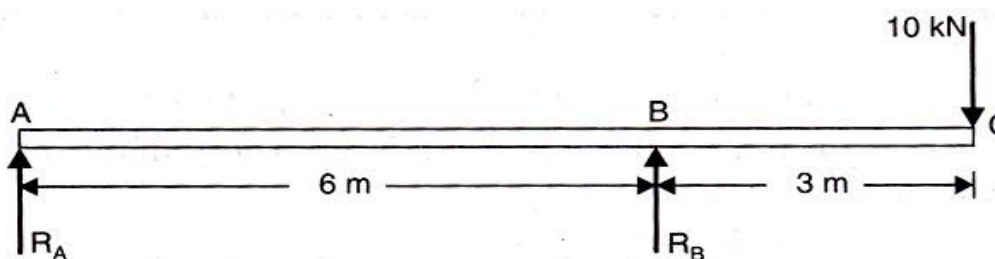


Figure 1

2. a) What is the difference between thin cylinders and thick cylinders? (5M)  
b) Derive the expressions for circumferential stress and longitudinal stress of a thin (10M)  
cylinder.
3. a) Derive an expression for a member subjected to direct stress in one plane. (8M)  
b) Define and explain the maximum shear stress theory of failure. (7M)
4. a) A closely coiled helical spring made of 12mm diameter steel wire has 16 coils of (12M)  
100 mm mean diameter. The spring is subjected to an axial load of 100N. Calculate  
the maximum shear stress induced, the deflection and stiffness of the spring.  
b) What is a polar section modulus? (3M)
5. Derive Rankine's Gordon formula what are the limitations. (15M)

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6. A short column of external diameter 40cm and internal diameter 20 cm carries an eccentric load of 80kN. Find the greatest eccentricity which the load can have without producing tension the cross section. (15M)
7. a) How to determine the resultant stress in unsymmetrical bending? (9M)  
b) Explain the terms unsymmetrical bending and shear centre. (6M)
8. Derive the forces in the truss shown in the figure below. (15M)

