Code: 1G641

II B.Tech. II Semester Supplementary Examinations October 2020
Strength of Materials-II
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)
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1. a) Explain the strains in a thin cylindrical shells due to internal pressure?

    b) Calculate the safe working pressure for a spherical vessel of 1.5m diameter and 1.5 cm wall thickness, if the tensile stress is limited to 4500N/cm^2.

2. Write the expression for maximum and minimum hoop stress for a thick cylindrical shell subjected to only internal fluid pressure?

3. a) Write the expression for torsional moment of resistance for a circular shaft.

    b) Generate the expressions for polar moment of inertial for solid and hallow circular shafts?

4. a) Derive the elongation of close coiled helical spring subjected to axial pull of W, with a diameter d, number of coils n and modulus of rigidity c.

    b) A close coiled helical spring is to be made out of 5mm diameter wire that is 2.0m long so that it deflects by 20mm under an axial load of 50KN. Determine the mean diameter of the coils. Take C=81GN/m^2.

5. a) Write the assumptions of Euler's theorem for long columns?

    b) Illustrate the intensity of crippling load for long column when both ends are hinged and fixed.

6. A short wooden pillar is rectangular in section of size 40cmx24cm.It carries at the top two point loads P and Q in the vertical plane bisecting the thickness p acting at 5cm from the centre on one side and Q at 8cm on the other side. If the stress is throughout compressive and the extreme intensity of stress on the side on which P acts three times the extreme intensity on the other side, calculate P:Q.

7. Write the assumptions made for the analysis of beam subjected to unsymmetrical bending. Determine the stresses due to unsymmetrical bending and deflection?

8. Design a semi-circular beam supported on three equally spaced columns. The centers of the columns are on a circular curve of diameter 8m.The beam is support a uniformly distributed factored load of 5KN in addition to its own weight.
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