Code No: 154CA

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester (Special) Examinations, January/February - 2021
STRENGTH OF MATERIALS – II
(Civil Engineering)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. Determine the diameter of a solid shaft which will transmit 300 kN at 250 rpm. The maximum shear stress should not exceed 30 N/mm ^{2} and twist should not be more than 10^0 in a shaft length 2m. Take modulus of rigidity G= 1×10^5 N/mm^2. [15]

2. A closely coiled helical spring of round steel wire 10 mm in diameter having 10 complete turns with a mean diameter of 12 cm is subjected to an axial load of 1000 N. Determine the deflection of the spring and maximum shear stress in the wire. Take G = 0.8×10^5 N/mm^2. [15]

3. A slender column fixed at one end and free at the other end is subjected to an eccentric load. Develop the expression for the maximum length 'L' of the column such that the defection at the free end does not exceed the eccentricity `e' of the loading. [15]

4. Determine the Euler's crippling load for a hollow cylindrical steel column of 38 mm external diameter and 2.5 mm thick. Length of column is 2.3 m and hinged at its both ends. Take E=2×10^5N/mm^2. [15]

5. Explain about the determination of stresses in the Retaining walls. [15]

6. A masonry dam of rectangular section, 20 m high and 10m wide, has water up to a height of 16m on its one side. Determine Position of centre of pressure and the point at which the resultant cuts the base. Take weight density of masonry = 19.62kN/m ^{3} and of water = 9.81kN/m ^{3}. Calculate the maximum and minimum stress intensities at base of dam. [15]

7. Determine the thickness of the shell of 100mm internal diameter when it is subjected to an internal fluid pressure of 30N/mm^2. The permissible tensile stress is 60 N/mm^2. [15]

8. Discuss about Shear centre for symmetrical and unsymmetrical sections with examples. [15]

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