R18

Code No: 154CA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, November/December - 2020
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. A Railway wagon having a mass of 5000kg and moving with a speed of 10km/h has to be stopped by four buffer springs in which the maximum compression allowed is 200mm. Determine the number of turns in each spring when the diameter of the wire is 30mm and the mean diameter of the coil is 150mm. Take $G=8\times10^4 N/mm^2$. [15]

2. A hollow circular shaft has to transmit 120 kW at 160 r.p.m. Find the internal and external diameters of the shaft, if the maximum Torque transmitted in each revolution exceeds the mean by 30%. Take allowable shear stress as 70 N/mm^2 and diameter ratio is 0.6. [15]

3. Develop the equation for maximum bending moment of a strut subjected to Compressive axial load and a transverse point load at Centre and whose both ends are pinned. [15]

4. An axially loaded column 6m high and having both ends fixed is made up of a wide flanged R.S.J having following properties. Section: 300 mm × 200 mm, Area: 7000 mm^2, I_{xx}: $12400\times10^4 mm^4$, I_{yy}: $1760\times10^4 mm^4$ and E: $2\times10^5 N/mm^2$. Determine the working load of the column using Euler's formula. Take factor of safety as 4. [15]

5. A masonry dam of trapezoidal section of 10m high. It has top width of 1m and bottom width 7m. The face exposed to water has a slope of 1 horizontal to 10 vertical. Determine the maximum and minimum stresses on the base, when the water level coincides with top of the dam. Take unit weight of masonry as 19.62 kN/m^2. [15]

6. Discuss about the determination of stresses in the chimneys. [15]

7. Develop the expressions for computations of hoop stress. [15]

8. Discuss about deflection of a beam under unsymmetrical bending. [15]

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