

G.R. No.

P118-151 (T2)

OCTOBER 2018 / IN - SEM (T2)

F. Y. M. TECH. (Design Engineering) (SEMESTER - I)

COURSE NAME: Advanced Stress Analysis

COURSE CODE: MEPA11181

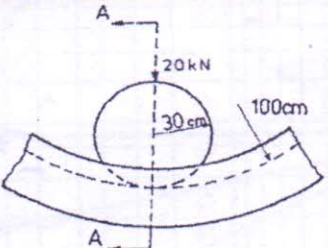
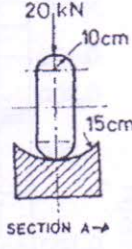
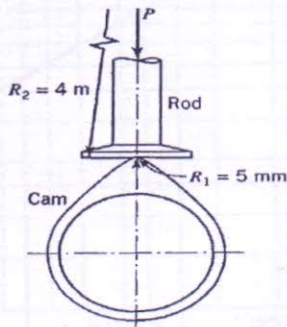
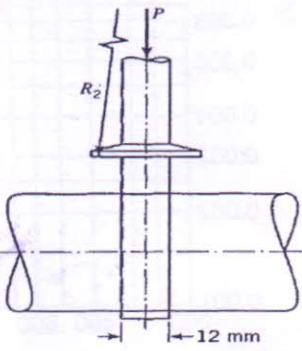
(PATTERN 2018)

Time: [30 Minutes]

[Max. Marks: 10]

(*) Instructions to candidates:

- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed
- 3) Use suitable data where ever required

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| Q. 1 | <p>A hardened steel roller ($E = 210 \text{ GPa}$ and $\nu = 0.29$) runs in an annular groove of cast iron member ($E = 110 \text{ GPa}$ and $\nu = 0.26$) with total load of 20 kN. Determine the maximum principal stress, maximum shear stress and locate the point where these stress occur.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> | 10 |
| | OR | |
| Q. 2 | <p>A cast-iron push rod ($E = 117 \text{ GPa}$ and $\nu = 0.20$) in a valve assembly is operated by a steel cam ($E = 200 \text{ GPa}$ and $\nu = 0.29$). The cam is cylindrical in shape and has a radius of curvature of 5.0 mm at its tip. The surface of the push rod that contacts the cam is spherical in shape with a radius of curvature 4.0 m so that the rod and cam are in point contact. If the allowable maximum principal stress of cast iron is -1400 MPa, determine the maximum load P that may act on the rod.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> | 10 |

