Total No. of Questions : 4]

SEAT No. :

PE583

[Total No. of Pages : 2

[6578]-56

S.E. (Robotics and Automation) (Insem)

STRENGTH OF MATERIALS

(2019 Pattern) (Semester - III) (211082)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Solve Two Questions.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Assume suitable data, if necessary.*
4) *Use of Logarithmic Table, Slide rule is Electronic pocket calculator is allowed.*
5) *Figures to the right indicate full marks.*

Q1) a) State the Hooke's & Draw the diagram from Ductile Material along with Nomenclature. **[4]**

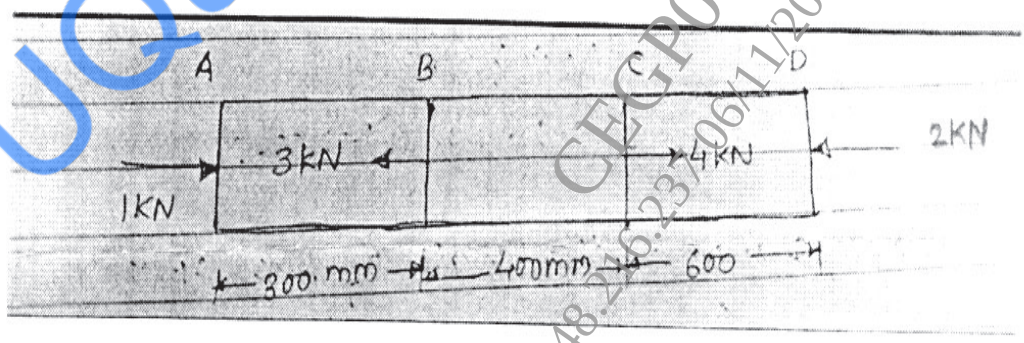
b) In a tensile test Carried out on 16mm diameter rod the elongation measured on 100mm length was found to be0.1mm under a load of 40KN. The change in diameter was found to be 0.045 mm. Determine Young's Modulus and Passions Ratio for Material also find change in Volume of bar. **[5]**

c) A steel bar 4m long is subjected to a pull of 85 KN. It is 30 mm in diameter for 1m of its length,25 mm Diameter for Next 2 m and 22 mm diameter for remaining length. Find the Total elongation of the BAR E = 200GPA. **[6]**

OR

Q2) a) Explain the concept of Thermal Stresses in Composite Bar and also derive the expression for same. **[5]**

b) A steel bar ABCD of Uniform cross section 100mm^2 is subjected to the axial forces as shown in fig Calculate change in length of the bar. Take E = 2×10^5 MPa **[5]**



P.T.O.

c) A circular hole is punched through 5mm thickness Al Plate if the ultimate sharing strength of AL is 120 MPa and safe compressive l strength for the punch is 80 MPa determine the maximum diameter of the hole that can be Punched. **[5]**

Q3) a) State The Different Types of Beam along with Figure. **[4]**

b) Define the Following Terms **[3]**

i) Beam

ii) Shear force Diagram

iii) Bending Moment Diagram

c) Draw the Shear Force and bending moment diagram AB of length 8m having point load of 4KN, 10 KN and 7KN at 1.5m,4m,6m from end A respectively. **[8]**

OR

Q4) a) Draw the Shear force and Bending Moment Diagram for the simply Supported Beam carrying UDL of 18 KN/m run spread a distance of 4m from the left end. Take the span of beam as 9m. **[7]**

b) A Mild steel rod of 20mm diameter and 300 mm long is enclosed centrally inside a hallow copper Tube and external diameter 30 mm and internal diameter 25 mm. This composite bar is subjected to an axial pull of 40KN. Find the stresses developed in rod and Tube take E_s = 200 KN/mm^2 E_s = 100 KN/mm^2 **[8]**