

**School of Engineering**  
B.TECH Civil Engineering  
Mid Term Examination - Nov 2023

Duration : 90 Minutes  
Max Marks : 50

**Sem III - G1UA302B - Mechanics of Materials**

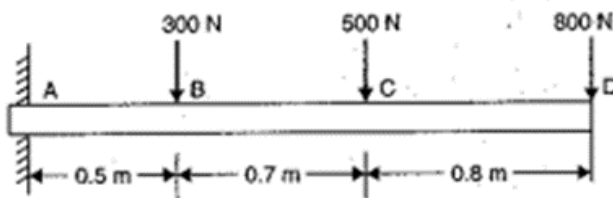
General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

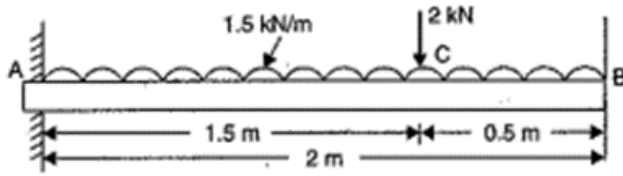
- 1) Classify the term centre of gravity K2 (2)
- 2) Define the Hooke's law K1 (3)
- 3) Explain the term Castiglione's theorem. K2 (4)
- 4) Outline the term centre of gravity and Centroid K2 (6)
- 5) Identify the i) young's modulus ii) the stress at elastic limit iii) % elongation & iv) % decrease in area, for tensile test was conducted on a mild steel bar. The following data as follow, Dia of the seel bar= 3cm , Gauge length of the bar=20cm, load at elastic limit=250KN, Extension at a load of 150KN =0.21mm, Max Load=380KN, Total Extension=60mm, Dia of the rod at failure=2.25cm K3 (6)
- 6) Solve a cantilever of length 2m carries a point load as shown in fig. Draw S.F and B.M diagram for the cantilever beam. K3 (9)



- 7) Examine the maximum instantaneous stress induced the tensile of 60KN is suddenly applied to a circular bar of 4cm diameter and 5m long. If the value of  $E=2.0 \times 10^5 \text{ N/mm}^2$  K4 (8)

- 8) Analyse cantilever beam of length 2m carries a UDL of 1.5 kN/m run over the whole length and a Point load of 2 kN at a distance of 0.5m from the free end. Draw S.F and B.M diagram for the cantilever beam.

K4 (12)



OR

- Analyse cantilever beam 1.5m long is loaded with an UDL of 2 kN/m run over of length of 1.25 from free end and a Point load of 2 kN at a distance of 0.25m from the free end. Draw S.F and B.M diagram for the cantilever beam.

K4 (12)

