



C09-C-106

3016

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2018

DCE—FIRST YEAR EXAMINATION

ENGINEERING MACHANICS

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

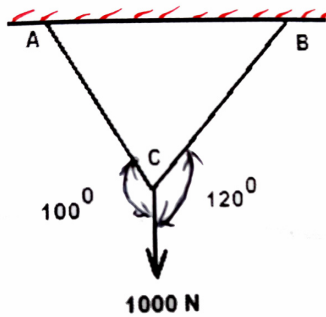
1. Define the system of forces a) Co-planar Forces b) Non-Coplanar Forces.
2. A body is acted upon by an upward force of 500kN and horizontal force of 800kN. Find the Magnitude and direction of the resultant force.
3. Define the centre of gravity of a body.
4. State the Parallel axis theorem.
5. Define *i)* Young's modulus *ii)* Shear modulus
6. Define the terms a) Malleability b) Ductility
7. If a bar is subjected to liner strain 1×10^{-3} and lateral starin 2.5×10^{-4} . Find the poisson's ratio.
8. Find the support reactions for a simply supported beam of span 8m subjected to point laods 10kN and 20kN at 3m and 6m from left hand support respectively.
9. Define Shear force and Bending Moment.
10. Define Point of Contra flexure.

PART-B

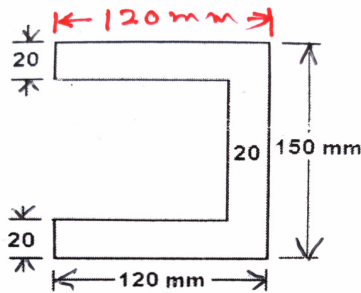
10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each questions carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

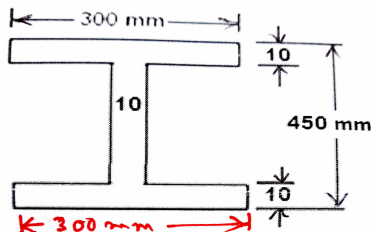
11. A weight of 1000N is supported by two chains as shown in figure below. Determine the tension in each chain.



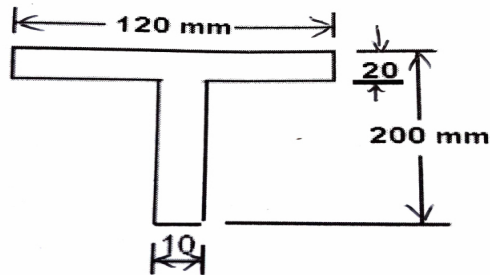
12. Find the Centroid \bar{X} from the back of the channel given in the figure below.



13. Find moment of inertia about the Centroidal axes for given I - section.

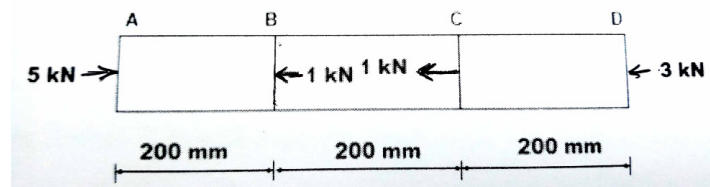


14. a) Find the Centroid \bar{Y} for the T-section shown in the figure below.



- b) Find the moment of inertia about X-axis and Y-axis for a rectangle of width 300mm and 450mm depth.

15. A copper rod 20mm diameter and 500mm long undergoes an elongation of 1mm and decrease in diameter 9×10^{-3} mm under tensile load of 50kN. Determine the Young's Modulus and Poisson's ratio.
16. A bar of steel of diameter 20mm and length 600mm is subjected to forces as shown below. Determine the change in length. $E = 2 \times 10^5 \text{ N/nm}^2$.



17. Draw SFD and BMD for a Simply supported beam of span 4m subjected to Uniformly distributed load of 15 kN/m throughout the span and give the values of Max. B.M and S.F
18. Draw SFD and BMD for a Cantilever beam of span 3m subjected to UDL 30N/m throughout the span. State the Maximum Values of SF and BM.

* * *