

Model Paper for End  
MODEL PAPER – BOARD DIPLOMA EXAMINATION,  
(C-23)DCE—FIRST YEAR EXAMINATION  
ENGINEERING MECHANICS (C-105)

[Total Marks: 80

Examination

PART—A

10×3 =30 Marks

**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 sentence

- 1) Define the terms 1.Static 2.Dynamics. (CO1)
- 2) State Parallelogram and triangle law of forces (CO1)
- 3) State the characteristics of couple. (CO1)
- 4) Distinguish between centriod and centre of gravity (CO2)
- 5) State and explain Parallel axis theorem (CO2)
- 6) Find the M.O.I of rectangle of width 200 mm and depth 400 mm about it's base (CO2)
- 7) Draw Stress-Strain Curve for Mild Steel specimen and indicate salient points (CO3)
- 8) State elastic constants and write their relationship. (CO3)
- 9) Define the terms Shear Force and Bending Moment (CO4)
- 10) Obtain the expressions for maximum SF and BM for SS beam carrying UDL through its length. (CO4)

PART – B

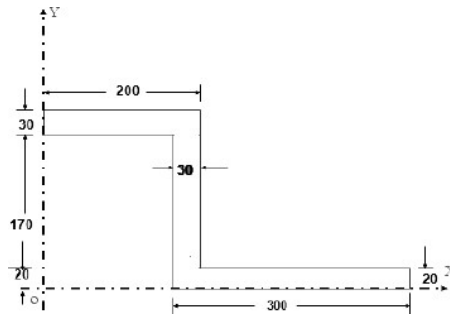
5 x 10 = 50 marks

**Instructions:**

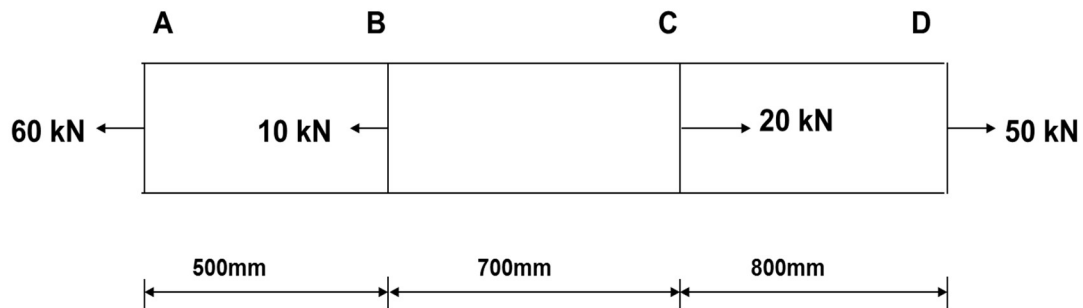
- i) Answer any FIVE questions
- ii) Each question carries TEN marks.
- iii) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11) (A) Find the magnitude and direction of resultant force for following forces acting at a point
  - (a) 80 KN due N
  - (b) 20 KN due N-E
  - (c) 40 KN due E
  - (d) 60 KN at 60° E of S and
  - (e) 70 KN at 60° S of W (CO1)
- 12) Find the magnitude and direction of the resultant of the two forces 80kN and 120 kN acting at a point with an included angle 60° between them. The force 120kN being horizontal (CO1)

- 13) Locate the centre of gravity of given Z – section with reference to the axes OX and OY. (CO2)



- 14) Find the Moment of Inertia of an angular section 350 x 250 x 16 mm with its long leg vertical.
- 15) A metal bar of 3 m long and 30 mm x 80 mm in cross section is stretched by 1.5 mm under an axial pull of 60 kN. Calculate the Tensile Stress, Longitudinal strain produced and Young's modulus of the material of the bar. (CO3)
- 16) A steel bar 30 mm diameter is acted upon by forces as shown in the fig. Find the total elongation in the bar taking  $E = 2.1 \times 10^5 \text{ N/mm}^2$



- 17) A cantilever 5m long carries three point loads of 20 kN, 30 kN at 1m, 2.5m and 4m respectively from free end. Draw S.F and B.M diagrams. Calculate S.F and B.M at 4.5 m from free end. (CO4)
- 18) A beam of span 8m freely supported at its ends carries a UDL of 10kN/m over a length of 3m from the left hand support. It also carries another UDL of 15kN/m over a length of 2m from the right hand support in addition to a point load of 30kN at its mid span. Calculate the Maximum SF and BM and draw SFD and BMD. (CO4)