

Roll No.

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**B. E. (Second Semester) (CGPA)
EXAMINATION, 2011-12**

(Civil Engg. Branch)

ENGINEERING MECHANICS

(CE-204)

Time : Three Hours

Maximum Marks : 60

Note : All questions are compulsory.

1. Fill in the blanks :

- (a) Product of inertia about principal axis is $1\frac{1}{2}$
- (b) Expression for ratio of tensions on the two sides of a belt is given by..... $1\frac{1}{2}$
- (c) System of forces in which all the forces in a plane meet at a point is called $1\frac{1}{2}$
- (d) Expression for Horizontal Range of projectile is given by $1\frac{1}{2}$

Choose the correct answer :

- (e) A body of weight W is placed on an inclined plane. The inclination of the plane with the horizontal is less than the angle of friction. The body :
- (i) will be in equilibrium

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- (ii) moves downwards
 (iii) moves upwards
 (iv) None of these
- (f) Moment of inertia of a circular lamina of diameter D about an axis passing through C.G. and perpendicular to plane of lamina is :
 (i) $\frac{\pi D^4}{32}$ (ii) $\frac{\pi D^4}{16}$
 (iii) $\frac{\pi D^3}{32}$ (iv) None of these
- (g) The relation between number of joints (j) and number of members (n) in a perfect frame is :
 (i) $j = 2n - 3$ (ii) $n = 2j$
 (iii) $j = 3n - 2$ (iv) $n = 3j$
- (h) A beam which is provided more than two supports is :
 (i) Overhanging beam (ii) Continuous beam
 (iii) Fixed beam (iv) None of these

2. (a) Write condition of equilibrium. 2
 (b) A system of connected flexible cable is shown in figure. Determine the forces in various segments of the cable. 8

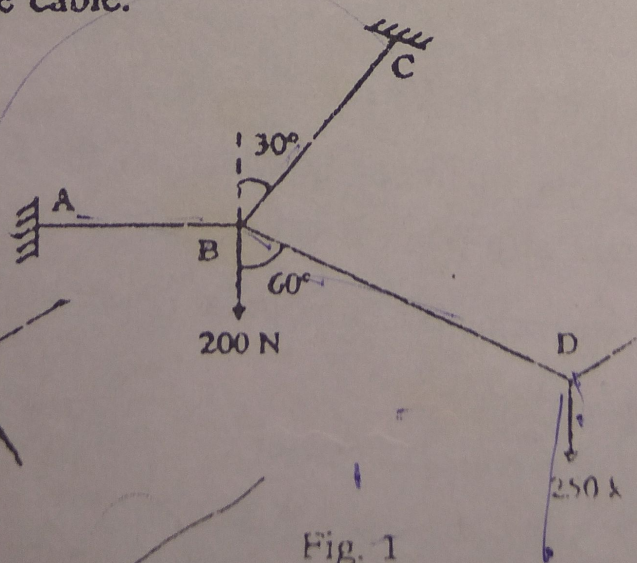


Fig. 1

(a) Write short notes on the following :

3

(i) Imperfect truss (ii) Redundant truss

(b) Find the forces in different members of truss as shown in figure.

7

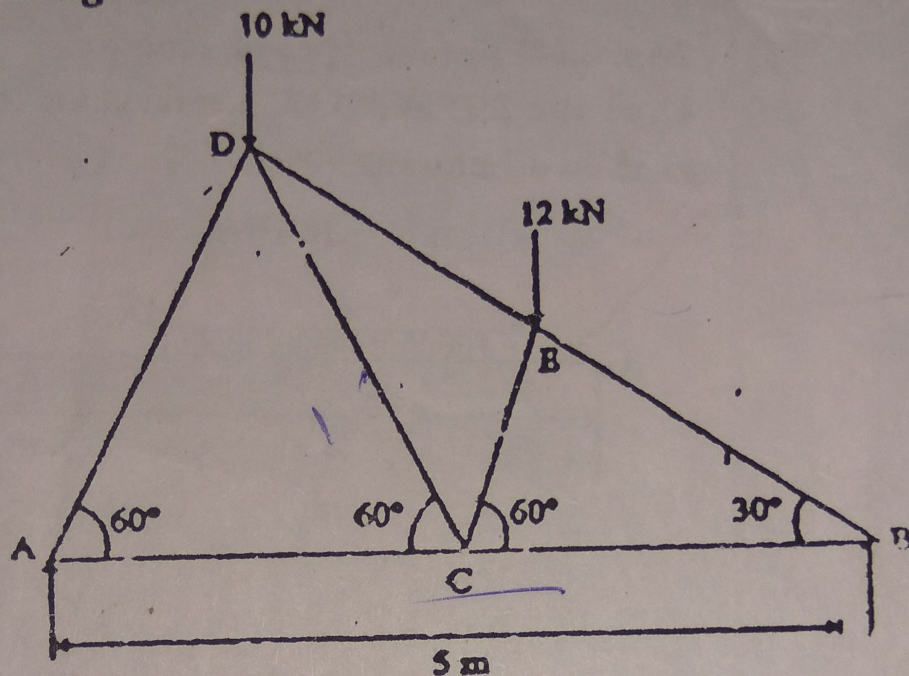


Fig. 2

3. (a) Write perpendicular axis theorem.

3

(b) Find the moment of inertia of the shaded area shown below edge AB.

7

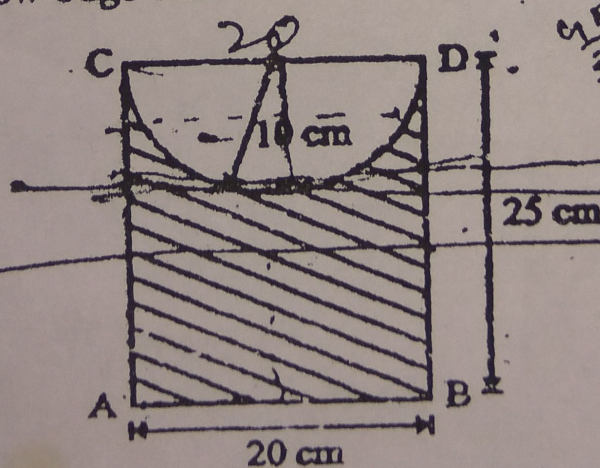


Fig. 3

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Or

- (a) Explain different types of support. 2
- (b) Draw the S.F. and B.M. diagrams for the beam loaded as shown below. 8

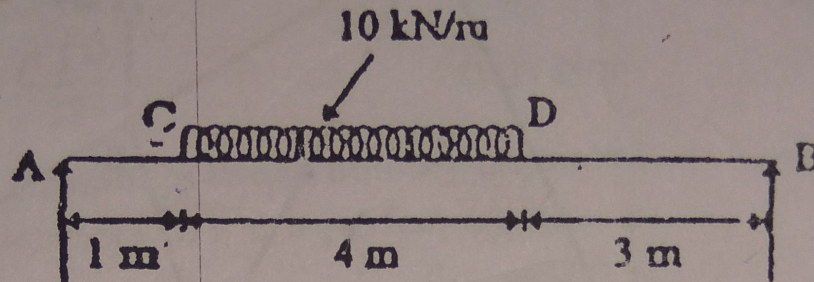


Fig. 7

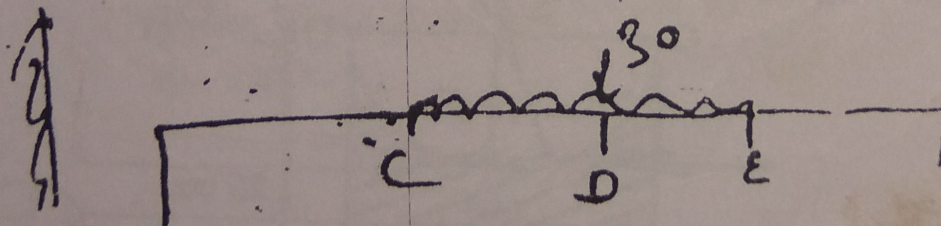
$$R_B \times 8 + 10$$

$$40x$$

$$10 \times 4 \times 4$$

$$160$$

$$C_{10} \times 2$$



$$X - x_1 A_1 + x_2 A_2$$