

Enroll No

Q.P.Code
E 1116

Course Code: RA203

Course Name: Engineering Mechanics

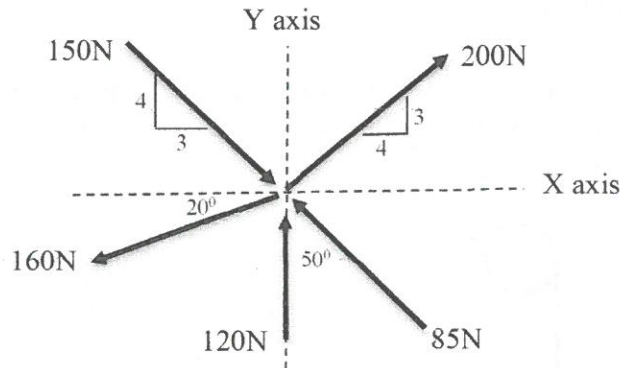
Day & Date: Monday 03/11/2025

Time : 2:30 To 5:30

Max Marks: 100

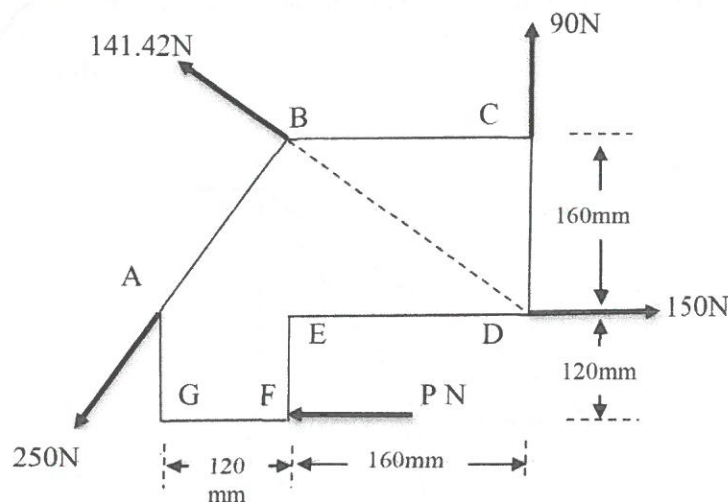
- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures in rounded() brackets within the question, indicate the scheme of marking for respective part of the question, whereas, figures in the first right column indicate total marks for that whole question.
 - 3) CO is the index number of the Course Outcome statement.
 - 4) The Bloom's taxonomy level (BL) for 1,2,3,4,5 and 6 is remember, understand, apply, analyze, evaluate and create respectively.
 - 5) Assume suitable data if necessary.
 - 6) Use of non-programmable calculators is allowed

- Q.1**
- | | | | | |
|-----|---|----|-----|-------|
| (a) | Define couple. State the properties of couple | 05 | CO1 | BL 01 |
| (b) | Compute resultant of the force system as shown in figure. | 10 | CO1 | BL 02 |

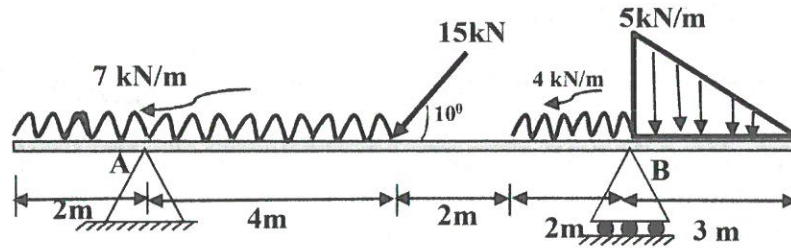


OR

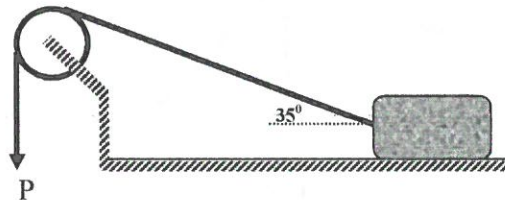
- (b)** The force system as shown in figure has unknown force P. Compute the magnitude of unknown force P such that resultant of all forces pass through point A. Hence determine magnitude and direction of resultant. 10 CO1 BL 02



- Q.2 (a)** Explain various types of supports of a beam and draw neat sketch of reactions offered by each support. **05 CO2 BL01**
- (b)** Compute support reactions for the beam loaded and supported as shown in figure. **10 CO2 BL 03**

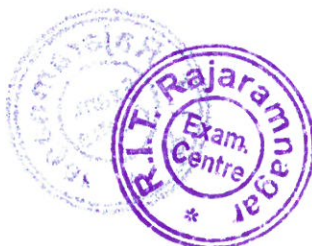
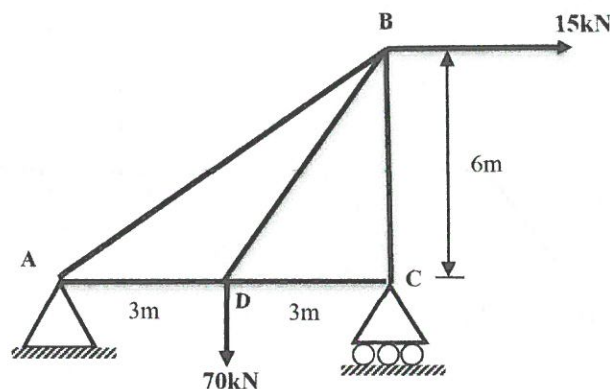


- Q.3 (a)** Define 1) Angle of Repose 2) Angle of Friction **04 CO2 BL 01**
- (b)** A body of weight 60 N is moving along a rough horizontal plane by a pull of 17N acting at an angle of 15° with horizontal. Compute the coefficient of friction. **05 CO2 BL 04**
- (c)** Compute the value of effort P, just to move the block of 175N if coefficient of friction between the block and floor is 0.3. Assume the pulley as frictionless. **06 CO2 BL 04**

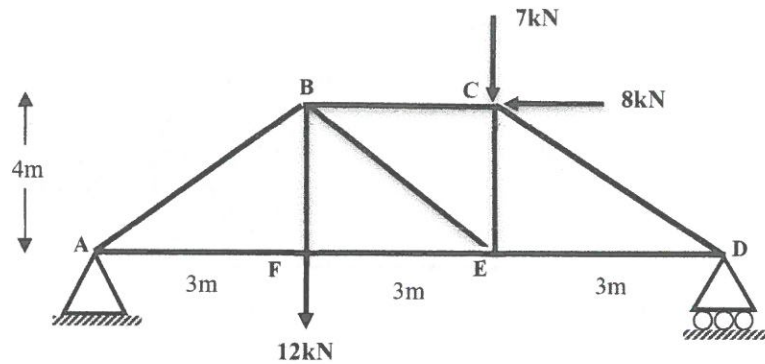


- Q.4 (a)** Compute the force in each member of the truss as shown in figure and tabulate the result with magnitude and nature of force in the members. **08 CO2 BL 04**

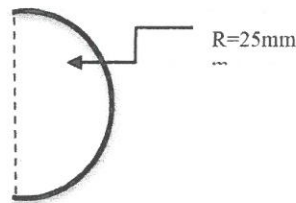
Apply Method of Joints



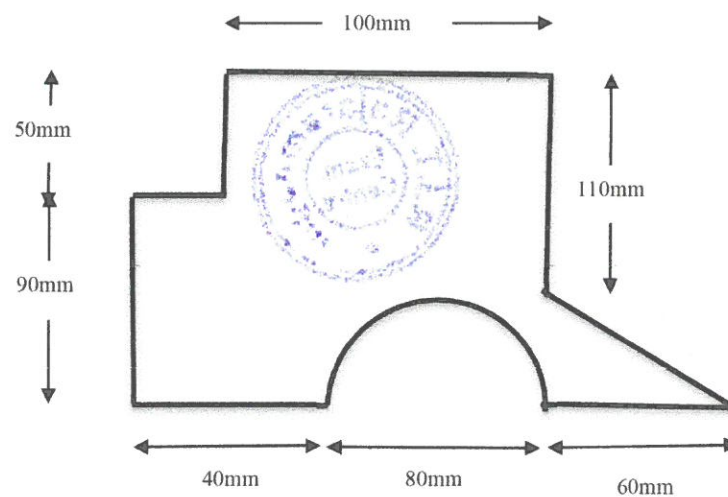
- (b) Compute the force in member BC, BE and FE of the truss as shown in figure and tabulate the result with magnitude and nature of force in the members. 07 CO2 BL 04
Apply Method of sections



- Q.5 (a)** Compute x and y coordinate of centroid of the semicircular plane lamina as shown in figure. 04 CO3 BL 04



- (b) Compute centroid of the plane lamina as shown in figure. 16 CO3 BL 04

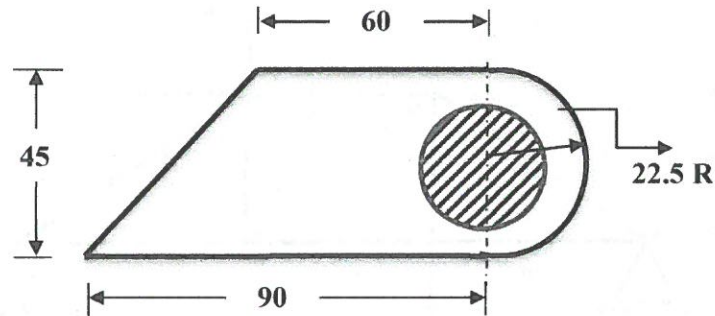


Q.6 (a) State parallel axis theorem, perpendicular axis theorem

05 CO3 BL 01

- (b) Compute Moment of Inertia of composite figure about horizontal Centroidal axis from which hatched circle of radius 15mm is removed. All dimensions are in millimeter.

15 CO3 BL 04



OR

- (b) Compute Moment of Inertia of composite figure given below about horizontal Centroidal axis. All dimensions are in millimeter.

15 CO3 BL 04

