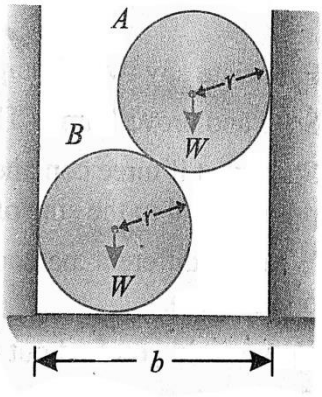
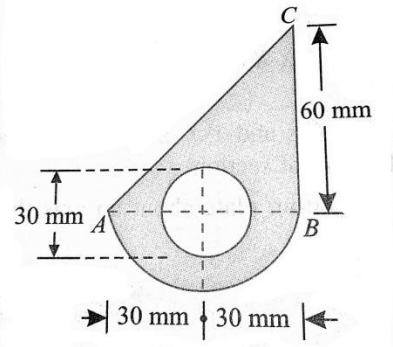
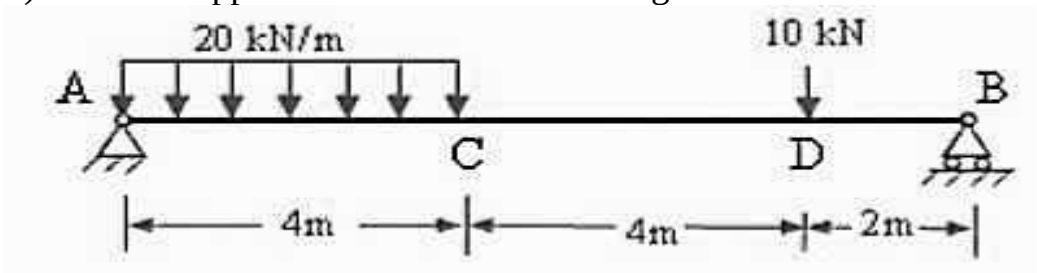
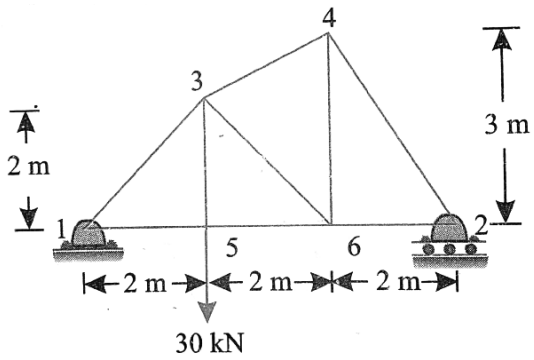
MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY

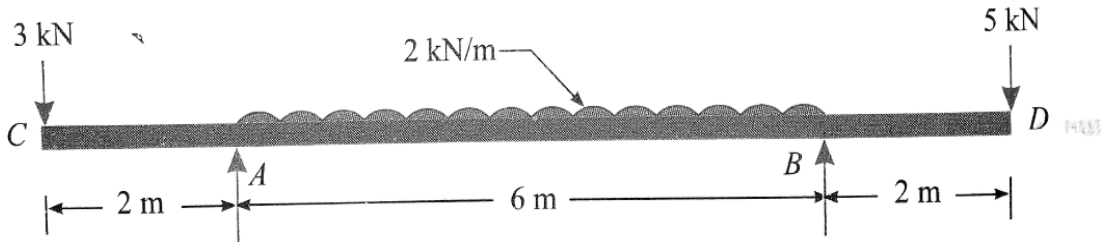
CIVIL ENGINEERING DEPARTMENT

END TERM EXAM JUNE 2021

Subject: Engg. Mechanics	**Subject code: CE125**
Group: A	**Maximum marks: 60**
Note: Attempt all question	**Semester: II**
Max. Time- 180 min.	
Subject Coordinator – Dr. Sarvesh P.S. Rajput	

Q.1	A) State and prove parallelogram law of forces? B) Distinguish clearly between resolution of forces and composition of forces? C) The following forces act at a point: (i) 20 N inclined at 30º towards North of East. (ii) 25 N towards North. (iii)30 N towards North West and (iv)35 N inclined at 40º towards South of west. Find the magnitude and direction of resultant force.	02 03 05
Q.2	A) State and prove Lami's Theorem. B) Two smooth spheres of weight W and radius r each are in equilibrium in a horizontal channel of A and B vertical sides as shown figure. Find the force exerted by each sphere on the other, if r=250 mm,b=900 mm and W =100N.  	04 06
Q.3	A) Prove the perpendicular axis theorem in the determination of moment of inertia of areas with the help of neat sketch.	03

	B) Find the moment of inertia of the lamina with a circular hole of 30 mm diameter above the axis AB as shown in figure below.  	07
Q.4	A) What are various type of loadings? Distinguish clearly between uniformly distributed load, uniformly varying load and triangular load.	03
	B) Find the support reaction of the following beam  	07
Q-5	A) What are the assumptions made, while finding out the forces in the various members of a framed structure?	02
	B) State and explain the analytical methods for finding out the forces in perfect frame?	02
	C) A plane truss of 6 m span is subjected to a point load of 30 kN as shown in the figure .Find the forces in all the member of the truss and tabulate the result.  	06

Q-6	A) Define the terms Shear force and Bending Moment?	02
	B) What do you understand by the term,'point of contraflexure'?	01
	B) A beam 10 m long carries load as shown in figure.Draw the shear force and bending moment diagrams for the beam .  	07