Sanjay Ghodawat University, Kolhapur

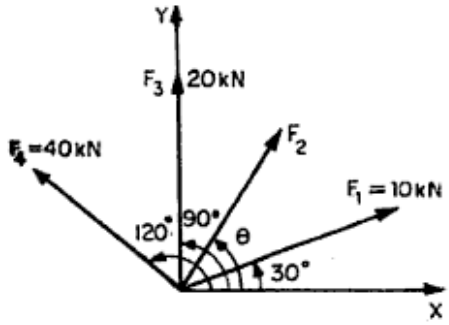
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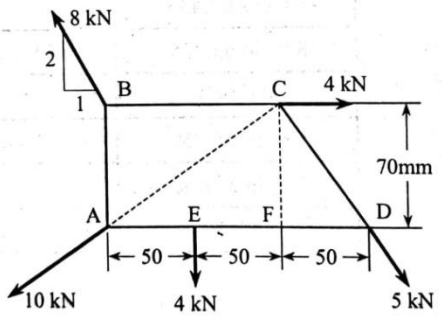
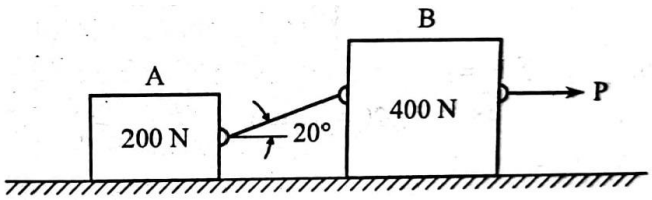
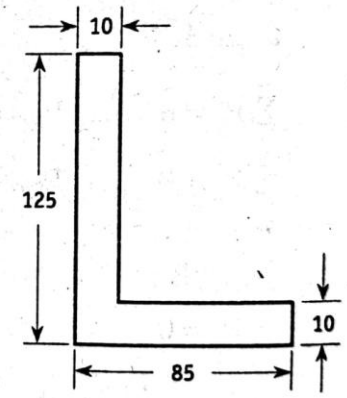
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EXM/P/09/00

Year and Program: 2020-21, FY B. Tech	**School of Technology**	**Department: F.Y B. Tech**
Course Code: FYT108R1	**Course Title: Engineering Mechanics**	**Semester : I**
Day and Date:	**End Semester Examination**	**Time : 2 Hrs.** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.
2) Use of Non programmable calculator is allowed.
3) Assume suitable data whenever required.

Q.1		**Answer/Solve the following (any Two)**	**Marks**	**Bloom's Level**	**CO**
	a)	State the law of parallelogram of forces and show that the resultant $R = \sqrt{P^2 + Q^2}$ when the two forces P and Q are acting at right angles to each other. Find the value of R if the angle between the forces is zero.	8	L2	CO1
	b)	The resultant of four forces which are acting at a point O as shown in fig. is along Y-axis. The magnitude of forces F1, F3 and F4 are 10kN, 20kN and 40kN respectively. The angles made by 10kN, 20kN and 40kN with X-axis are 30^o, 90^o, and 120^o respectively. Find the magnitude and direction of force F2 if resultant is 72kN.  Fig.01	8	L3	CO1
	c)	A lamina ABCDEA is acted upon by forces as indicated in the figure. Determine resultant of forces and locate the same on X and Y axes, assuming the lamina to be available in the 1st quadrant at the point A as the ref. point.	8	L3	CO1

		 Fig.02			
Q.2		**Answer/Solve the following (any two)**			
	a)	Illustrate the assumptions made in the analysis of Simple truss and Define zero force members.	8	L2	CO2
	b)	Two blocks, tied together by a 20^0 inclined string are to be moved by a force P as shown in fig. Find the magnitude of force P if the coefficient of friction under block A is 0.20 and under block B is 0.35.  Fig.03	8	L3	CO2
	c)	For the L-section shown in figure, determine M.I and Radius of gyration about two mutually perpendicular centroidal axes.  Fig.04	8	L3	CO2
Q.3		**Answer/Solve the following (any two)**			
	a)	Define: (i) Coefficient of Restitution (ii) Oblique Impact (iii) Direct Impact	9	L2	CO4
	b)	Particle A moves towards north with velocity and acceleration	9	L3	CO3

		35m/sec and 8m/sec^2 respectively. Particle B moves towards south with velocity and acceleration of 30m/sec and 10m/sec^2 respectively. What is relative velocity of A w.r.t B at time t =1.5 sec.			
	c)	A ball of mass 1kg moving with velocity 12m/sec undergoes a direct central impact with a stationary ball of mass 2 kg. The impact is of perfectly elastic. The speed of 2 kg mass ball after impact will be?	9	L3	CO4

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