BM.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

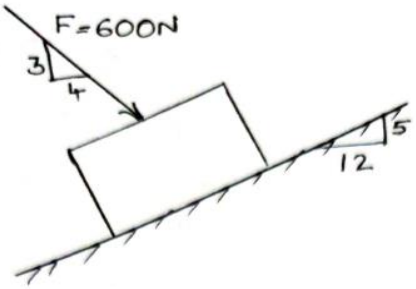
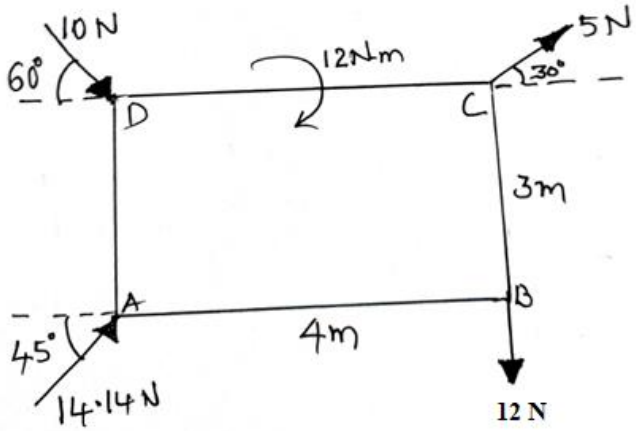
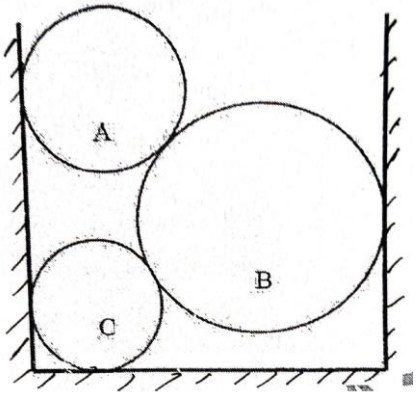
February / March 2024 Semester End Main Examinations

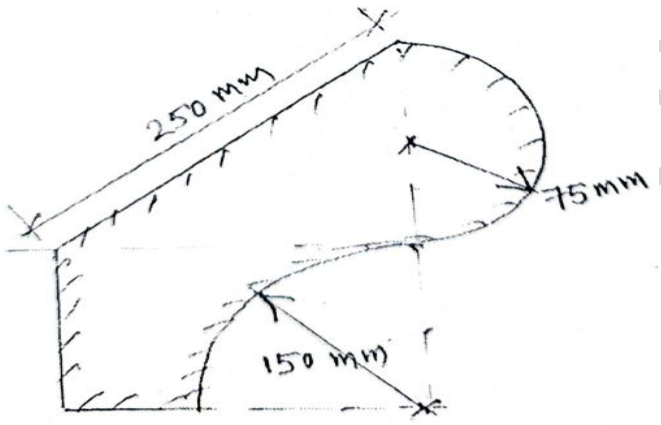
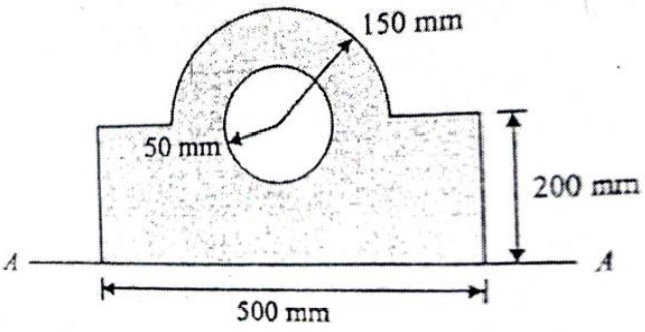
Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 23CV1ESICV / 22CV1ESICV/ 22CV2ESICV **Max Marks: 100**
Course: Introduction to Civil Engineering

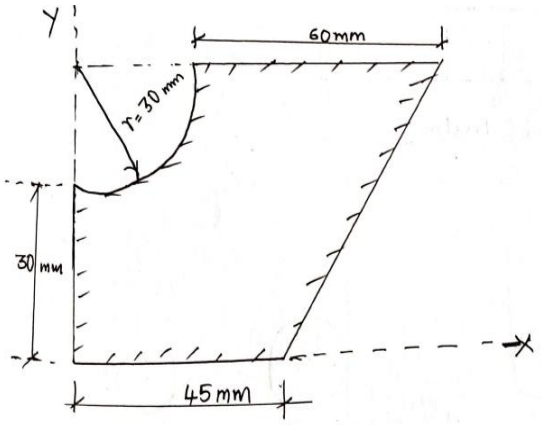
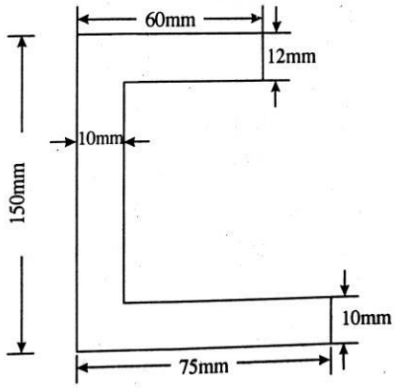
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	CO	PO	Marks
1	a)	Explain briefly the role of a Civil Engineering professional in the context of the following fields. (i) Highway Engineering (ii) Construction and Project Management.		CO1	PO6	**8**
	b)	Explain briefly the importance and uses of Plain Cement Concrete and Reinforced Cement Concrete in Civil engineering construction		CO1	PO6	**6**
	c)	Explain briefly the functions of the following structural elements in a building. (i) Foundation (ii) Lintel (iii) Plinth		CO1	PO6	**6**
		UNIT -2				
2	a)	Briefly outline the impact of (i) Clean water and Sanitation (ii) Affordable and Clean Energy, as sustainable development goals on construction and Infrastructure projects.		CO2	PO7	**10**
	b)	Explain briefly how the recent developments in following fields have contributed to the betterment of human community (i) Smart Building. (ii) Intelligent Transportation systems		CO2	PO7	**10**
		UNIT-3				
3	a)	List the different systems of forces and explain them briefly with sketches		CO3	PO1,2	**4**
	b)	A block is resting on an incline of slope 5:12 as shown in Fig Q3(a). It is subjected to a force of 600N on a slope of 3:4 as indicated. Determine the components of F parallel and perrpendicular to the incline. Neglect weight of the block.		CO3	PO1, 2	**6**

			 FigQ 3(a)			
		c)	Determine the resultant of the force system acting on rectangular plate as shown in Fig Q3 (c). Locate the position of resultant with respect to point 'A'. Indicate the position of the resultant in the figure shown.  Fig Q3 (c)	CO3	*PO1,2*	**10**
			OR			
	4	a)	Three homogenous and smooth spheres A, B and C weighing 300 N, 600 N and 200 N respectively and having diameters 300 mm 600 mm and 200 mm respectively are placed in a trench of base width 700 mm as shown in Fig Q4(a). Determine the reactions at all the contact points of spheres and the sides of trench assuming all contacts surfaces to be smooth.  Fig Q4 (a)	CO3	PO1 .2	**15**

		b)	The resultant of two concurrent forces P and Q is 780 N and directed vertically up. If force P = 450 N acting N 38^0 W, find the force Q in magnitude and direction.	*CO3*	*PO1, PO2*	**5**
			UNIT -4			
	5	a)	Distinguish between the terms centroid and center of gravity. Explain the significance of centroid of an area.	CO4	PO1, 2	**5**
		b)	With usual notations obtain the coordinates of centroid of a quadrant of circle of given radius	CO4	PO1, 2	**5**
		c)	Locate the centroid of a plane lamina shown in Fig Q5(a) with respect to bottom left extreme corner	CO4	PO1, 2	**10**
			 Fig Q5(c)			
			UNIT-5			
	6	a)	State & prove Perpendicular axis theorem	CO4	PO1, 2	**5**
		b)	Explain radius of gyration and mention its significance.	CO4	PO1, 2	**5**
		c)	Determine the moment of inertia of the area shown in Fig Q6(c) about the horizontal axis passing through the centroid  Fig Q6(c)	CO4	PO1, 2	**10**
			OR			

	7	a)	Determine the moment of inertia of the shaded area shown in FigQ7(a) about the X-axis indicated.  FigQ7(a)	CO4	PO1, 2	**10**
		b)	Determine the moment of inertia of the channel section shown in FigQ7(b) about the horizontal centroidal axis.  FigQ7(b)	CO4	PO1, 2	**10**

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