U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

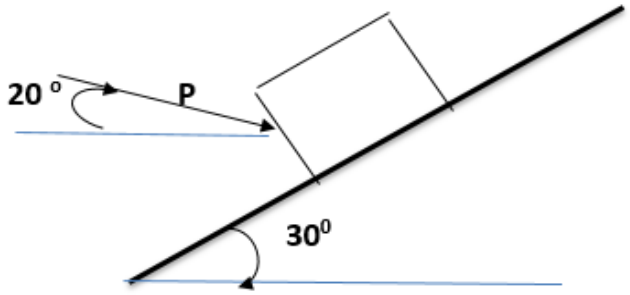
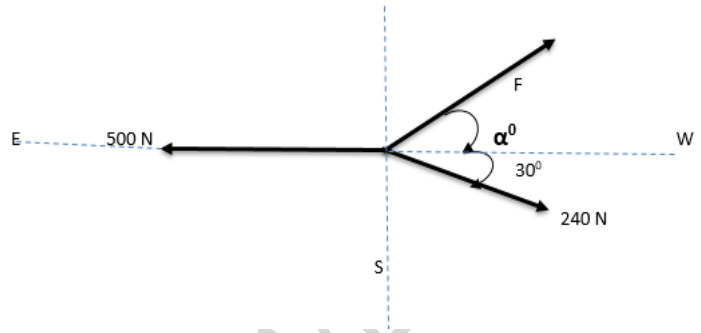
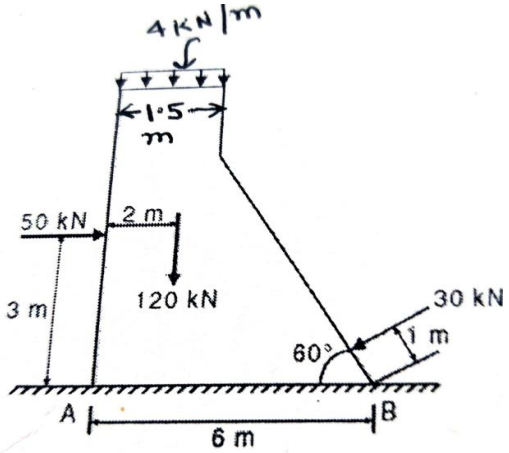
September / October 2023 Semester End Main Examinations

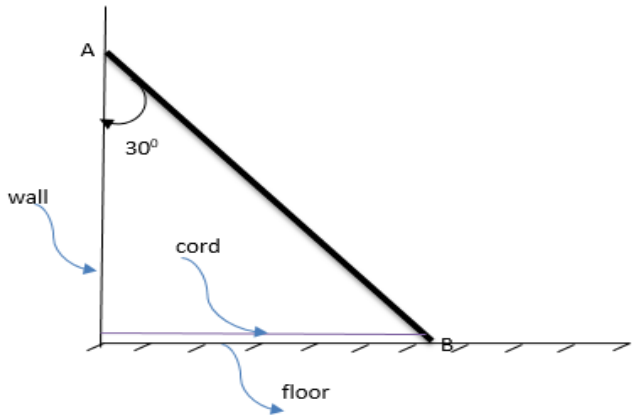
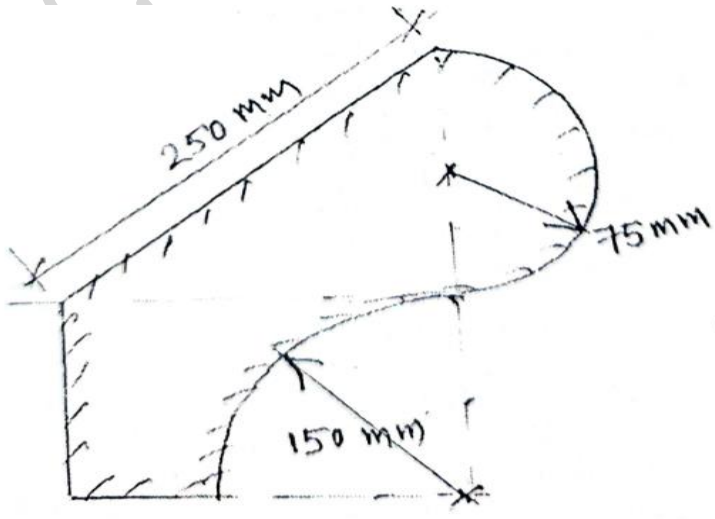
Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22CV1ESICV / 22CV2ESICV **Max Marks: 100**
Course: Introduction to Civil Engineering

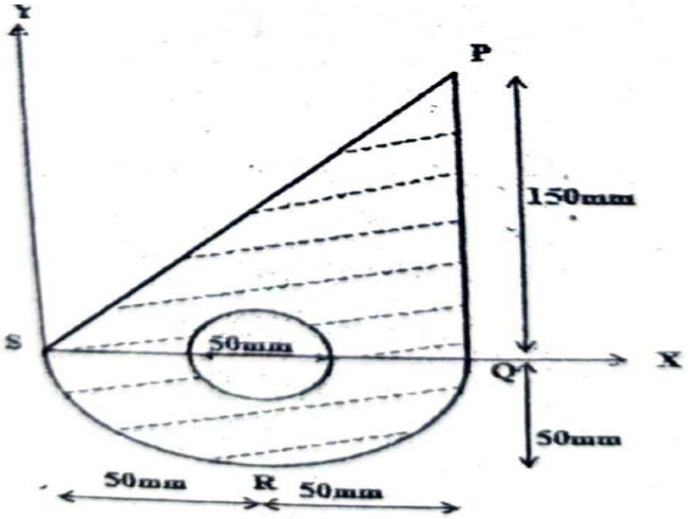
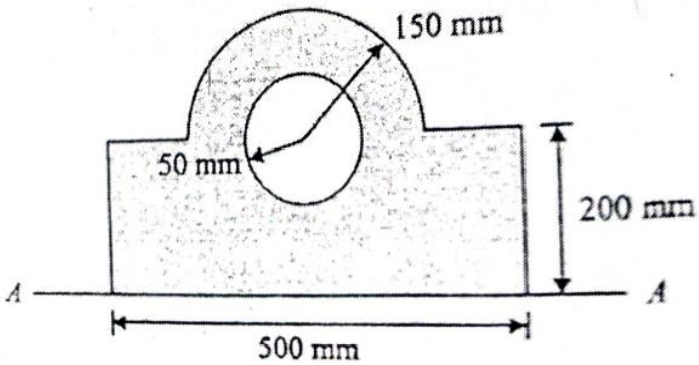
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

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) Geotechnical Engineering (ii) Irrigation and Water Resources Engineering	CO1	PO6	**10**
	b)	Explain the importance benefits of Structural steel and Plain Cement Concrete in Civil Engineering construction.	CO1	PO 6	**10**
		UNIT - II			
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.	CO 2	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	CO 2	PO 7	**10**
		UNIT - III			
3	a)	Explain with neat sketches different types of force systems.	CO 3	-	**06**
	b)	A block on the 30^0 incline shown in FigQ3(b) is acted upon by a force P inclined at 20^0 with horizontal. If P is resolved into components parallel and perpendicular to the incline, compute the value of perpendicular component of P and the force P, if the parallel component is 300N.	CO 3	PO 1 & 2	**06**

			 FigQ3(b)			
		c)	The force system shown in Fig Q3(c) has a resultant of 300 N acting downward to the right at an angle of 60^0 with horizontal. Determine the value of F and **α^0** required to give this resultant.  Q3(c).	CO 3	PO 1 &2	**08**
			OR			
4	a)	A section of a gravity dam is subjected to a system of forces as shown in FigQ4(a). Determine the resultant of the forces and locate its position with respect to the point 'A'. For the safety of the dam the resultant should lie in the central one third of the base width AB. Does it?  FigQ4(a).	CO 3	PO 1&2	**12**

		b)	A ladder weighing 500 N and having a certain length, rests against a wall at 'A' and against a floor at 'B' as shown in Fig Q 4(b). The reaction on the ladder by wall and the floor are normal to wall and the floor at 'A' and 'B' respectively. The ladder is in equilibrium due to a cord at 'B' tied to wall as indicated. Find the forces acting on the ladder at A and B. Find the change in tension in cord, if an additional weight of 300 N acts at A.  FigQ4(b).	CO 3	PO1& 2	**08**
			UNIT-4			
5	a)		Explain the significance of Centroid and Centre of Gravity.	CO 4	-	**04**
	b)		With usual notations obtain from first principles the coordinates of centroid of a quadrant of a circle	CO 4	PO1	**06**
	c)		Determine the coordinates of centroid of the shaded area shown in FigQ5(c). Take bottom extreme left corner as origin.  FigQ5(c)	CO 4	PO 1	**10**

			UNIT - V			
	6	a)	State and explain the Theorem of Parallel Axes	CO 4	-	**05**
		b)	With usual notations derive an expression for moment of inertia of semicircle about its symmetrical axis.	CO 4	PO1	**05**
		c)	For the shaded area shown in FigQ6(b), determine the radius of gyration about the horizontal axis passing through the centroid.  FigQ6(c)	CO 4	PO1	**10**
			OR			
	7	a)	A right angled triangle in a plane has a base 100 mm and a height of 300 mm. Determine the radii of gyration of the triangle about the horizontal and vertical axes passing through its centroid.	CO 4	PO 1	**05**
		b)	Explain polar moment of Inertia with relevant sketches	CO 4	-	**05**
		c)	Determine the moment of inertia of the shaded area shown in FigQ7(c) about an axis parallel to 'A-A' located 50 mm above AA.  FigQ7(c).	CO 4	PO1	**10**

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