Model Question Paper- I

CBCS SCHEME

First/ Second Semester B.E Degree Examination,

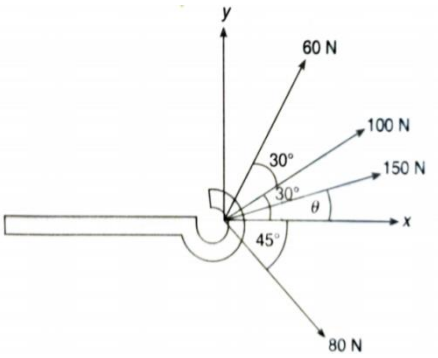
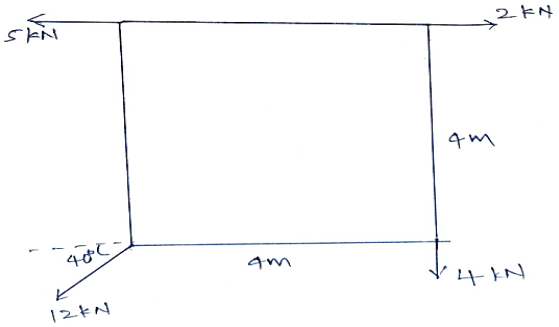
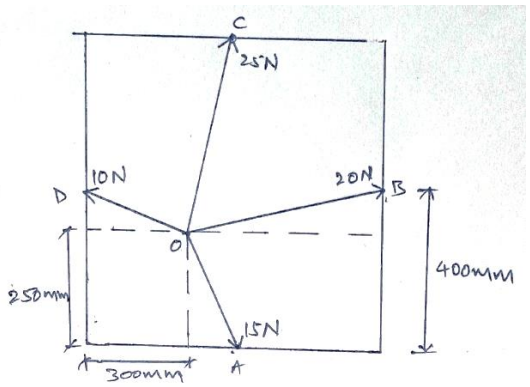
BUILDING SCIENCE AND MECHANICS (1BESC104A/204A)

TIME: 03 Hours **Max.Marks:100**

Notes:

1. *Answer any FIVE full questions, choosing at least ONE question from each MODULE*
2. *M: Marks, L: Bloom's level, C: Course outcomes.*
3. *Assume the missing data, if any*

		Module - 1	M	L	C
Q.1	a	Explain the Role of Civil engineers in Infrastructural development.	8	2	1
	b	Discuss the requirements of good stairs.	7	3	1
	c	Illustrate the importance of Surveying and Geotechnical Engineering in civil engineering projects.	5	3	1
OR					
Q.2	a	Explain the properties of concrete.	8	2	1
	b	Describe the various types of infrastructure that are crucial for a nation's growth.	7	3	1
	c	A new metro rail line is being planned. Identify and describe how at least four different civil engineering specializations would contribute to the project.	5	3	1
Module – 2					
Q.3	a	Explain the scope of IGBC and the benefits of IGBC.	8	2	2
	b	Explain the evaluation process of LEED rating system	7	3	2
	c	Brief the technologies involved in smart city development.	5	3	2
OR					
Q.4	a	Compare how IGBC and GRIHA address energy efficiency in building operations.	8	2	2
	b	Explain the Uses of Autoclaved Aerated Concrete (AAC) blocks in Civil engineering projects	7	3	2
	c	Discuss the characteristics of green materials.	5	3	2
Module – 3					
Q.5	a	Explain the following : i. Idealisations in Engineering Mechanics ii. Characteristics of force	8	2	3

	b	Four forces acting on a hook are as shown in following figure. Determine the direction of the force 150N such that the hook is pulled in x- direction. Also determine the resultant force.  Figure Q 5(b)	7	3	3
	c	Find the resultant, its direction, magnitude and distance from topmostright point of the lamia shown in the Figure Q 5(c).  Figure Q 5(c)	5	4	3
		OR			
Q. 6	a	State and prove Varignon's theorem.	8	2	3
	b	The striker of a carrom board lying on the board is being pulled by 4 players as shown in the Figure Q 6(b). The players are sitting exactly at the centre of four sides. Determine the resultant of forces both in magnitude and direction.  Figure Q 6(b)	7	3	3
	c	A 150 X 300 mm plate is subjected to four loads, as shown in Figure Q 6(c). Find the resultant of the four loads.	5	4	3

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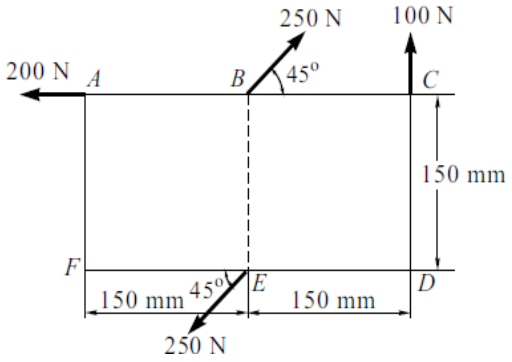
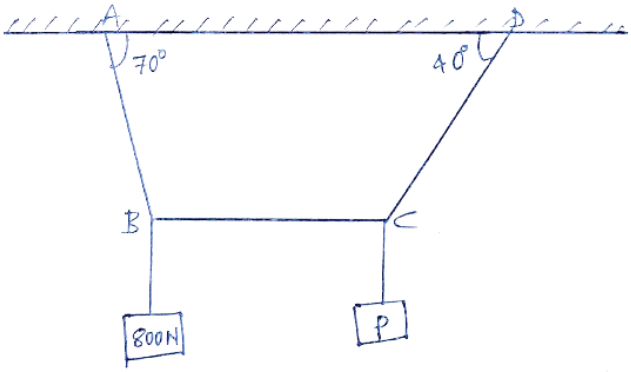
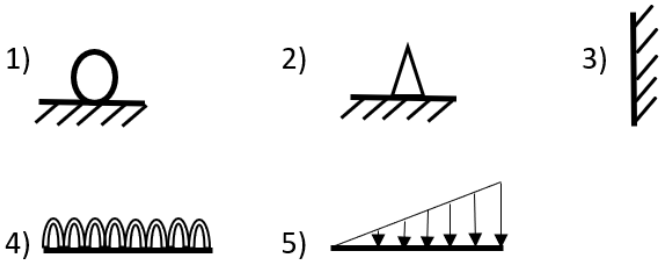


Figure Q 6(c)

Module – 4

Q.7	a	With a neat sketch, explain the various types of loads acting on a structure and types of Beams.	8	2	3
	b	The following Figure Q 7(b) shows a cable supporting two loads, 800N and 'P'. If BC is horizontal, calculate the value of load 'P'. Also, find the tensile force developed in various segments of the rope.  Figure Q 7(b)	7	3	3
	c	Identify and explain the following symbols shown in Figure Q 7(c),  Figure Q 7(c)	5	4	3

OR

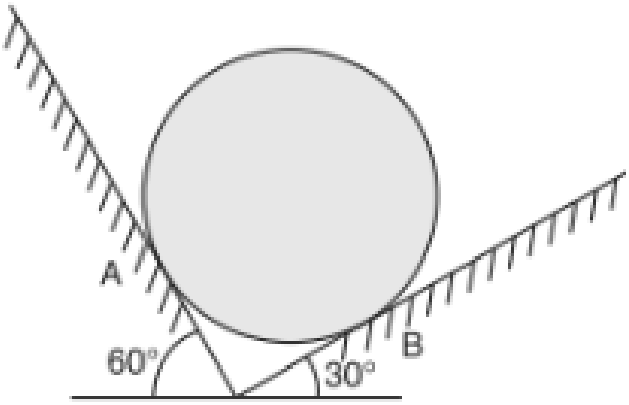
Q.8	a	State and prove Lami's Theorem.	8	2	3
	b	A sphere weighing 100 N is fitted in a right-angled notch as shown in Fig.2(b). If all contact surfaces are smooth, determine the reaction at contact surfaces. 	7	3	3

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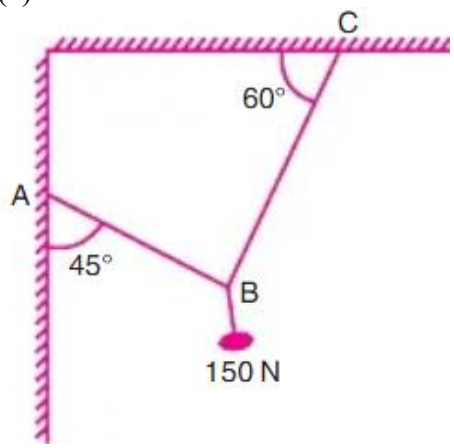
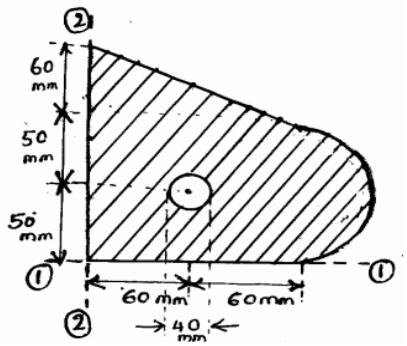
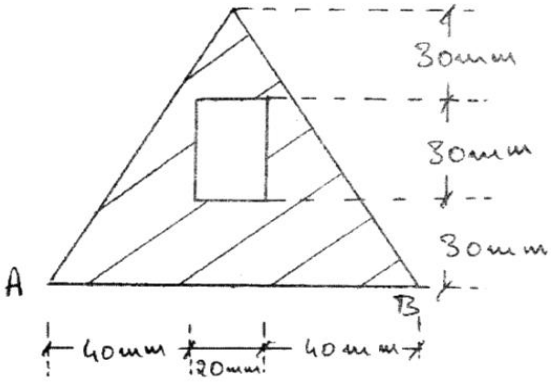
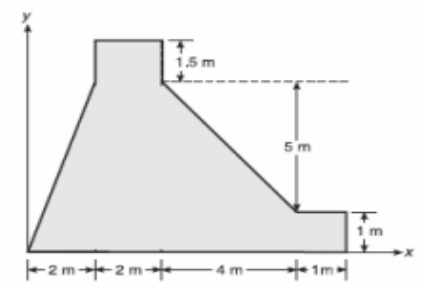
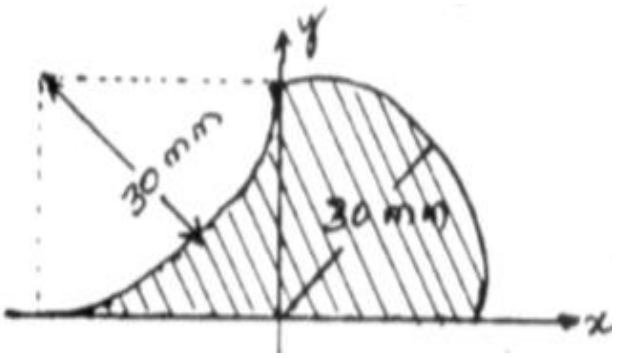
		Figure Q 8(b)			
	c	Calculate the forces developed in the wires, supporting an electric fixture as shown in Figure Q 8(c)  Figure Q 8(c)	5	4	3
Module – 5					
Q.9	a	Derive the Centroid coordinates of a triangle by method of Integration.	8	2	4
	b	Determine the position of centroid of the lamina with circular cutout as shown in Figure Q 9(b).  Figure Q 9(b)	7	3	4
	c	Locate the centroid of the shaded area shown in Figure Q 9(c),  Figure Q 9(c)	5	4	4
OR					
Q.10	a	Derive expression for the centroid of a semi-circular lamina of Radius “R” by the method of integration.	8	2	4
	b	Determine the centroid of the section of the concrete dam as shown in Figure Q 10(b).	7	3	4

		 Figure Q 10(b)			
	c	Determine the centroid of the lamina shown in Figure Q 10(c)  Figure Q 10(c)	5	4	4