Model Question Paper-1 with effect from 2020-21 (CBCS Scheme)

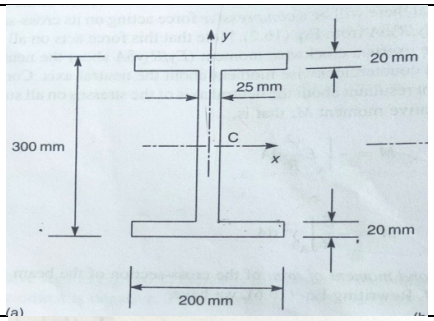
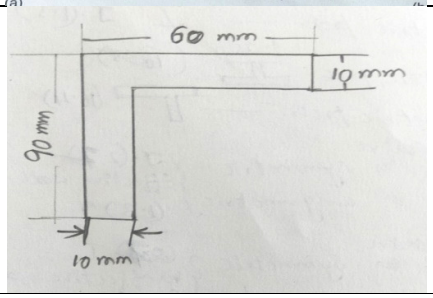
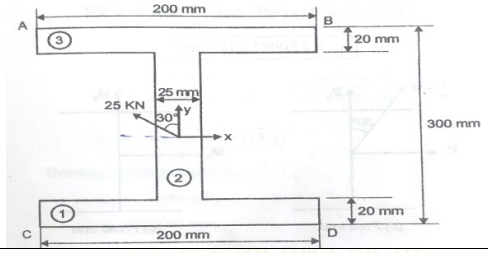
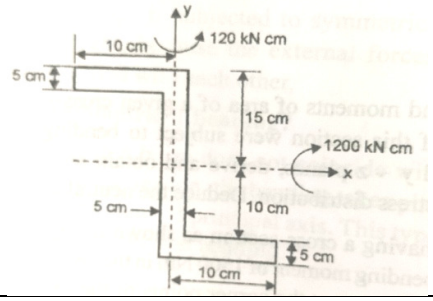
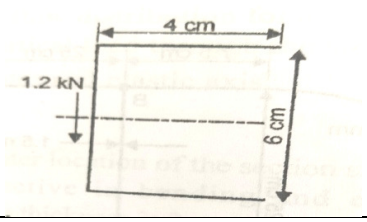
USN

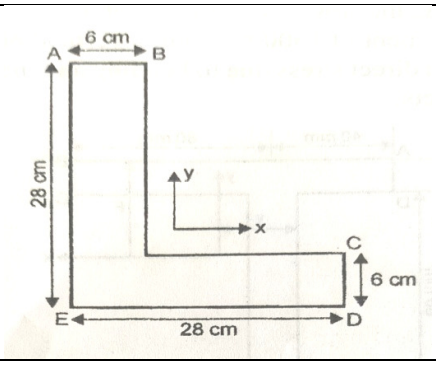
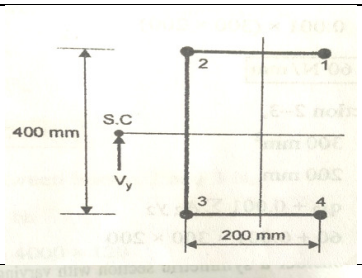
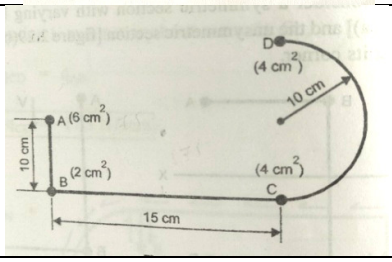
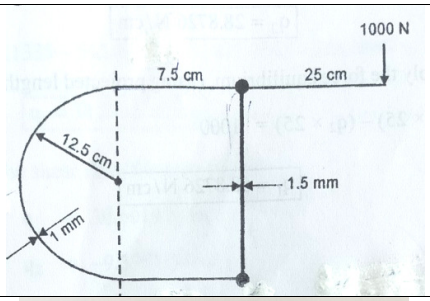
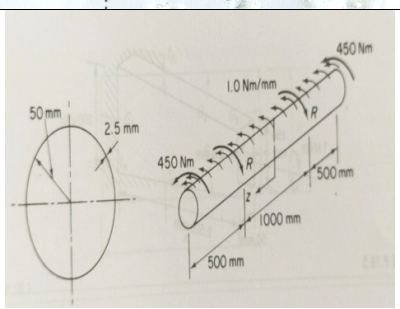
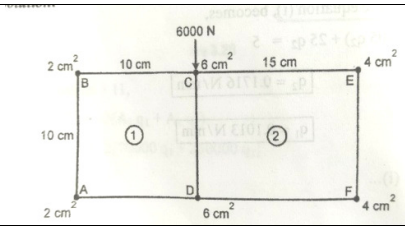
Fifth Semester B.E. Degree Examination

Aerospace Structures-II

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

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

				Marks
		Module -1		
Q.01	a	Calculate the direct stress distribution for the following section where the beam is subjected to a bending moment of 100KNm applied in a plane parallel to the longitudinal axis of the beam inclined at 30^0 to the left of the vertical.		10
	b	Calculate the tensile and compressive stresses for the following section which undergoes the bending moments of 10 KNm and 12 KNm along X,Y axis respectively.		10
		OR		
Q.02	a	Calculate the direct stress along the depth of the cantilever beam as shown in fig having length of 6 m		10
	b	Obtain the bending stress values at all points for the following section.		10
		Module-2		
Q. 03	a	Plot the shear flow distribution and find shear centre for the section given below. Take t= 2mm		10

	b	A beam having cross section as shown in the figure is subjected to a bending moment of 1500 Nm in vertical plane. Calculate the shear flow along the section.		10
		OR		
Q.04	a	Calculate the shear flow and shear centre for the channel section as shown in the following figure where V_y= 48000 N acting through shear centre. Assume that each boom area is 300 mm^2		10
	b	Determine the shear flow distribution for the section which is undergoing a load of 10 KN in a vertical manner.		10
		Module-3		
Q. 05	a	Determine the shear flow and shear centre for the following section.		10
	b	A uniform thin walled beam section is circular in Cross section and has a constant thickness of 2.5 mm. The beam is 2000 mm long carrying end torques of 450 Nm in the same sense a distributed torque loading of 1 Nm/mm. The load are reacted by equal couple's R at section 500 mm distant from each end. Calculate the maximum shear stress in the beam. Take G = 30000 N/ mm^2.		10
		OR		
Q. 06	a	Determine the shear flow distribution for the following section.		10

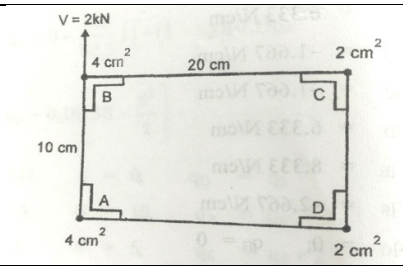
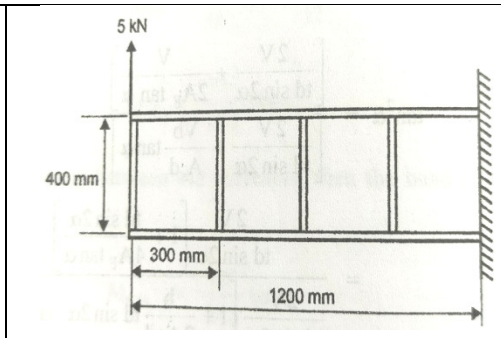
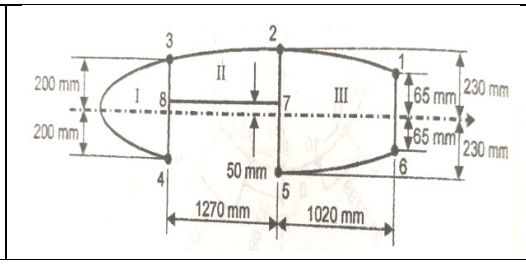
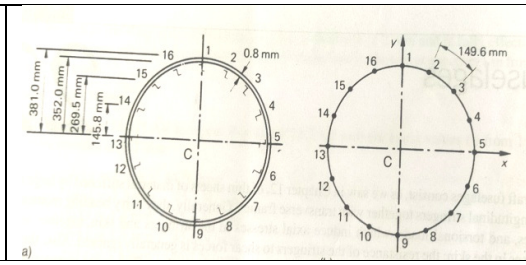
	b	Calculate the shear flow distribution for the following stiffened structure.		10
		Module-4		
Q. 07	a	Explain Tension field beams.		20
		OR		
Q. 08	a	The beam as shown below is assumed to have a complete tension field web. If the cross sectional area of the flanges are 350 mm^2 and 300 mm^2 respectively and the elastic section modulus of each flange is 750 mm^3. Determine the maximum stress in a flange where the thickness of the web is 2 mm and the second moment of area of a stiffener about an axis in the plane of web is 2000 mm^4. Take E = 70000 N/ mm^2		10
	b	Give a note on Crippling stresses.		10
		Module-5		
Q. 09	a	The wing section as shown in figure has been idealized such that booms carrying all the direct stresses. If the wing section is subjected to a bending moment of 300 KN m applied in a vertical plane, calculate the direct stresses in the booms.Boom areas; $B_1=B_6=$ 2580 mm^2, $B_2=B_5=$3880 mm^2,$B_3=B_4=$ 3230 mm^2		10
	b	Explain the loads and structures on space craft.		10
		OR		
Q. 10	a	Calculate the direct stress distribution for the following fuselage section which subjected to a bending moment of 200 KN-m applied in vertical plane of symmetry.		10
	b	Explain the following 1.Nano tubing 2. Flyingbeffector 3. Inflatable structures		10

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome

Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	L3	CO1	PO1,PO2,PO3
	(b)	L3	CO1	PO1,PO2,PO3
Q.2	(a)	L3	CO1	PO1,PO2,PO3
	(b)	L3	CO1	PO1,PO2,PO3
Q.3	(a)	L3	CO2	PO1,PO2,PO3
	(b)	L3	CO2	PO1,PO2,PO3
Q.4	(a)	L3	CO2	PO1,PO2,PO3
	(b)	L3	CO2	PO1,PO2,PO3
Q.5	(a)	L3	CO2	PO1,PO2,PO3
	(b)	L3	CO2	PO1,PO2,PO3
Q.6	(a)	L3	CO2	PO1,PO2,PO3
	(b)	L3	CO2	PO1,PO2,PO3
Q.7	(a)	L2	CO3	PO1,PO2,PO3,PO12
Q.8	(a)	L3	CO1	PO1,PO2,PO3
	(b)	L2	CO2	PO1,PO2,PO3,PO12
Q.9	(a)	L3	CO1	PO1,PO2,PO3
	(b)	L2	CO2	PO1,PO2,PO3,PO12
Q.10	(a)	L3	CO1	PO1,PO2,PO3
	(b)	L2	CO3	PO1,PO3,PO12

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering(knowledge):L_1	Understanding Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6

Model Question Paper-2 with effect from 2020-21(CBCS Scheme)

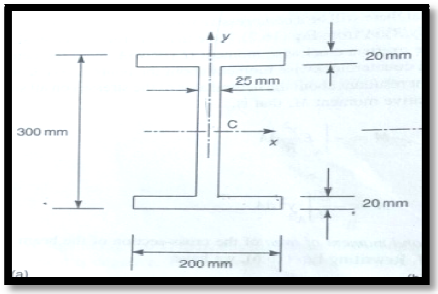
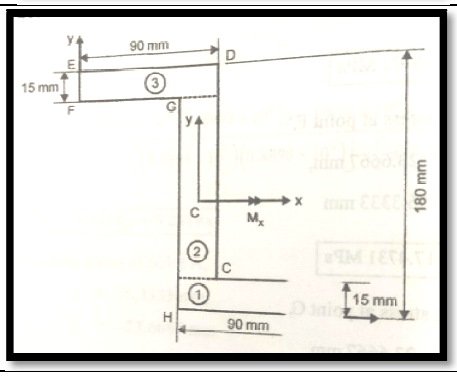
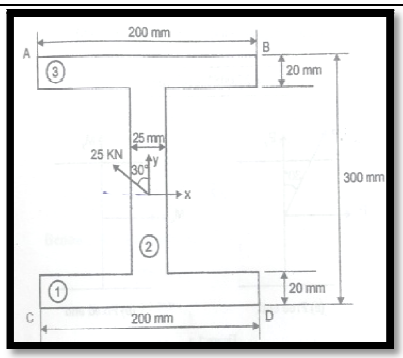
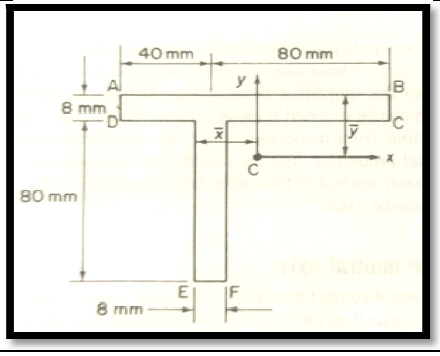
USN

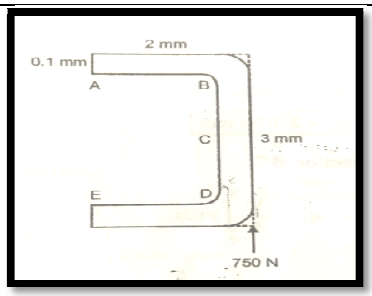
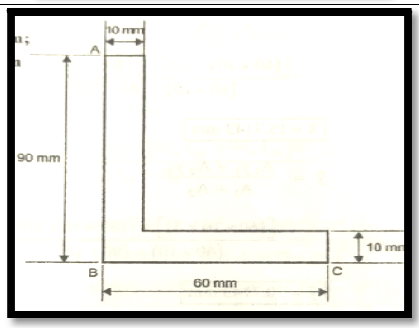
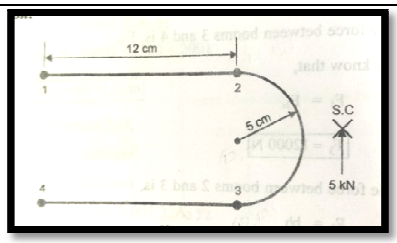
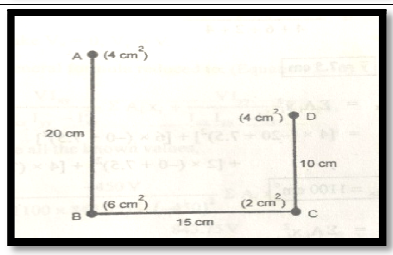
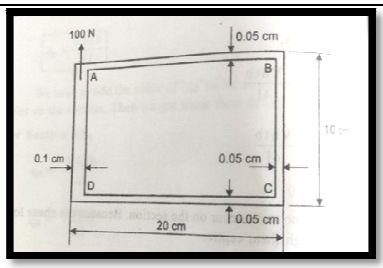
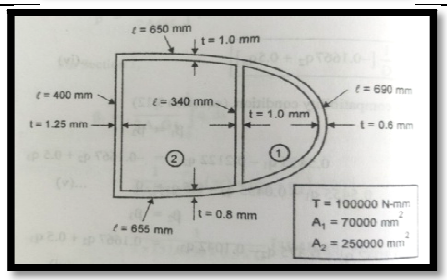
Fifth Semester B.E. Degree Examination

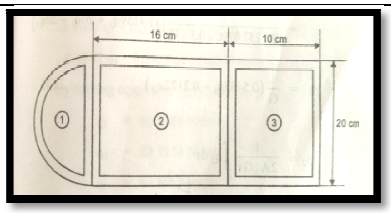
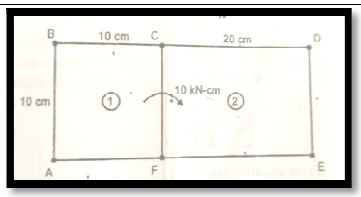
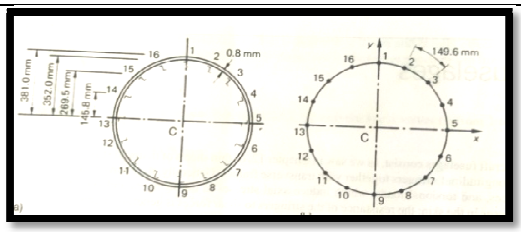
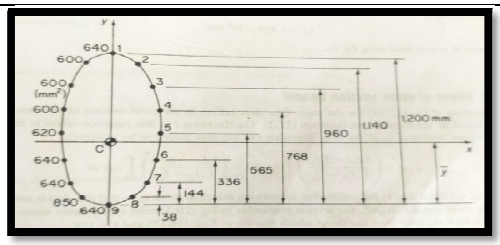
Aerospace Structures-II

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

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module -1		**Marks**
Q.01	a	Calculate the direct stress distribution through the depth of the beam for the following section where the beam is subjected to a bending moment of 100 KNm in a vertical plane.		10
	b	Calculate the tensile and compressive stresses for the following Z section if the moments are M_x=4 KNm, M_y=6 KNm.		10
		OR		
Q.02	a	Calculate the direct stress for the following cantilever beam section having length of 4 m.		10
	b	Calculate the direct stress for the following section subjected to a bending moment of 1500 Nm in a vertical plane.		10

		Module-2		
Q. 03	a	Calculate the shear flow distribution and shear centre for the following section.		10
	b	Calculate the shear flow distribution in the following section, where V_x=10 KNm, V_y=12 KNm.		10
		OR		
Q.04	a	Calculate the shear flow distribution and also shear centre for the following stiffener panel section where each boom area is 4 mm^2.		10
	b	Calculate the shear flow distribution for the following section when it is undergoing a load of 8 KNm in a vertical manner.		10
		Module-3		
Q. 05	a	Find the internal resisting shear flow pattern for following section ABCD.		10
	b	Calculate the shear flow in the given cell structure and also calculate the angle of twist per unit length.		10
		OR		

Q. 06	a	A multi cell structure as shown in the following figure is subjected to a torque of 1000N-m. Calculate the shear flow in the structure where the structure has constant thickness of 3mm.		10
	b	Determine the shear flow and angle of twist per unit length for the following multi cell structure, if the section has constant thickness of 0.1 cm. Take G= $25*10^5 N/cm^2$.		10
Module-4				
Q.07	a	Explain Wagner's beam theory.		20
OR				
Q. 08	a	Write a note on pure bending of thin plates.		10
	b	Give a note on crippling stresses.		10
Module-5				
Q. 09	a	Calculate the direct stress distribution for the following fuselage section which undergoes a bending moment of 100 kNm.		10
	b	Write a note on launch vehicle structures.		10
OR				
Q. 10	a	Calculate the direct stress distribution for the following fuselage section is subjected to a bending moment of 100 KNm.		10
	b	Explain the following. 1. Inflatable structures 2. Flying effector 3. Nano tubing.		10

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