			Reg.	No ·		T			1 8	Edoa
	13		Itog.	140						
		6	uestio)	n Pap	er Cod	le : 5	003	3		
		B.E./B.Tech. I		Sixth eronautic SITE MA	Semester al Enginee	ering AND S				7
	Time	e: Three Hours		The parent			1	Maximu	m:100	Marks
					e dudi-					
	(87				LL questio	ns		(7.0)		
	(8)		Hills time on		RT – A				2=20 N	
		Write complianc at a point in an				's law s	tress-st	rain rela	ationsh	ips
	2.	List down any fo	ur reinforcer	nent mater	rials and res	sins use	ed in cor	nposite	materia	als.
2		Determine the i					lamina	with a	70% fil	oer
	4.	What is major P	oisson's rati	0?			many be			
	5.	Define inter lam	inar stresse	s with caus	ses.					
	6.	List out the mer	its and dem	erits of Tsa	i-hill failur	e theor	y.			
	7.	Distinguish bety	veen creep a	nd creel.						77
	8.	What are the de	sired proper	ties of the	matrix mat	erial?	Horan'			
		What are the three basic elements in a sandwich structure? Mention their functions.								
	10.	What is fillet for	ming?							
									16=80 N	
		a) Using the mid the four elas	cromechanic tic moduli (s approach E ₁ , E ₂ , v ₁₃	, derive the $_2$ and G_{12})	in an u	nidirec	ssions t	oevalua	ate
		lamina.								(16)
			(OK)							

50033 A graphite/epoxy cuboid specimen with voids has dimensions of a x b x c and its mass is Mo. After it is put it into a mixture of sulfuric acid and hydrogen peroxide, the remaining graphite fibers have a mass Mr. From independent tests, the densities of graphite and epoxy are ρ_1 and ρ_m , respectively. Determine the volume fraction of the voids in terms of a, b, c, $M_{f^{t}}$ $M_{c},\,\rho_{f}$ and ρ_{m} . (16)12. a) Show the reduction of an isotropic material stress-strain equations to those of monoclinic material stress-strain equations. (16)b) i) Determine the compliance and stiffness matrix for a graphite/epoxy lamina. The material properties are given as follows: $\rm E_1=181~GPa,\,E_2=10.3~GPa,\,E_3=10.3~GPa,\,v_{12}=0.28,\,v_{23}=0.60,\,v_{13}=0.27,\,G_{12}=7.17~GPa,\,G_{23}=7.17~GPa,\,G_{31}=7.17~GPa.$ (8) ii) Determine the engineering constants of a 60° graphite/epoxy lamina. Use the properties of a unidirectional graphite/epoxy lamina as follows: (8) $E_1 = 181 \text{ GPa}, E_2 = 10.3 \text{ GPa}, v_{12} = 0.28, G_{12} = 7.17 \text{ GPa}.$ a) A [0/30/-45] graphite/epoxy laminate is subjected to a load of N_x = N_y = 1000 N/m. Using the properties of unidirectional graphite/epoxy ($E_1 = 181 \text{ GPa}$, $E_2 = 10.3 \text{ GPa}$, $v_{12} = 0.28$, $G_{12} = 7.17$ GPa) and assuming that each lamina is 5 mm thick, find Midplane strains and curvatures. (16)Global and local stresses on top surface of 30° ply. b) Derive the strain - displacement equations for a plate under in-plane loads such as shear and axial forces and bending and twisting moments using classical lamination theory. (16)14. a) Explain the various methods of glass fiber manufacturing processes with (16)b) Enumerate in detail about the typical production autoclave with a schematic diagram. What is the principle of autoclave curing process? (16)15. a) What are the basic design concepts used for the construction of sandwich structures? Summarize it with neat sketches. (16)(OR) b) i) Write a short note on the fabrication methods for Honeycomb core. (8) ii) Explain briefly about the honeycomb processing prior to the adhesive (8) bonding process.