MANIPAL INSTITUTE OF TECHNOLOGY Manipal University, Manipal – 576 104			
MANIPAL INSTITUTE OF TECHNOLOGY Manipal University, Manipal – 576 104	ENOWLEDGE IS POWER		
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I Semester M.Tech. (Manufacturing Engineering and Technol			
I Semester M.Tech. (Manufacturing Engineering and Technology) End Semester Examinations – Nov/Dec - 2015			
Time: 3 Hours. MA	X.MARKS: 50		
instructions to Candidates:			
 Answer ANY FIVE FULL questions. Draw neat sketches using PENCIL only. 			
1 a Explain the working principle of shape memory alloys stating its application	ons. 04		
1 b Write short notes on refractory metals and alloys.	03		
1 c With a neat sketch explain electroforming process of substrate coating.	03		
2 a Write the significance of surfaces in engineering design. Write any two	o surface 04		
cleaning methods.			
2 b With a neat sketch describe Laser beam surface hardening.	03		
2 c Explain Induction method of case hardening.	03		
3 a Derive expression for modulus of elasticity under Iso stress loading of co	omposite		
materials. E-glass fibers are used to reinforce nylon in an industrial applied	cation. If		
the nylon contains 40% glass fibers by volume, what fraction of the applied	d force is		
carried by the glass fibers? (The modulus of elasticity for E-glass fibers a	nd nylon		
are 10.75 $\times 10^6$ N/mm ² and 0.5 $\times 10^6$ N/mm ² , respectively).	04		
3 b Explain slip casting method of ceramic fabrication technique.	03		
3 c Differentiate structural ceramics from functional ceramics. List the me	ethods to		
increase the strength of ceramics.	03		
4 a What are the resin properties required to get a good composite struct	ure? 04		
4 b Explain CVD. Write two differences between PVD from CVD.	03		
4 c What is infiltration technique? Explain any two infiltration techni	iques of		
manufacturing MMC's.	03		

5 a	Explain the tool coating factors that may improve the tool performance.	04
5 b	Explain the filament winding method of manufacturing PMC's.	03
5 c	What are super alloys. Explain two phases of nickel based super alloys.	03
6а	Write short notes on Carbon-Carbon composites and Cermets.	04
6 b	Explain solid, liquid and gas carburizing.	03
6 c	What are intermetallic compounds? Explain any two.	03
