प्रज्ञानं ब्रह Manipa	MANI Ma III SEM. MECH/IP EN MATERIAI	PAL INSTITUTE OF TECHNOLOGY anipal University, Manipal – 576 104 IGG. B.TECH. DEGREE EXAM., DEC 2015 / JAN. 2016	OWER Day		
Time: 3 Hours Max. Marks: 50					
In	structions to candidates:	(1) Answer All questions.(2) Missing data, if any, may be suitably assumed.(3) Use Graph sheets if required.			
(A)	Write short notes on the fe	ollowing:			
l (B)	(i) Carbonitriding (ii) Flar Write the procedure of of Indices :	ne hardening btaining Miller Indices of planes. Sketch the following Miller	Z		
	i) (304) ii) [234]		-		
l (C)	Explain the procedural s	teps for the construction of binary phase diagram where the			
	components show mutual for the same.	liquid and solid solubility and also draw the labeled diagram			
2 (A) 2 (B)	Melting temperatures of r A and B are mutually sol liquid phase alloy contain of two solid solutions a approximately 10 and 15 Assuming the solubility of the regions. For 60% B all a) Weight percentage of th c) Composition of the liqu Write short notes on: (i) F	netal A and metal B are 1000°C and 800°C respectively. Metal suble in the liquid state and partly soluble in the solid state. A ing approximately 30% A completely transforms into a mixture at 500°C. Maximum solubility of A in B and B in A are i% respectively at 500°C, 8% and 5% respectively at 300°C. curves to be linear, draw the phase diagram to scale and label loy determine the following: the Eutectic mixture formed. and phase for the reaction. Free machining steel (ii) Cubic lattices.	2		
2 (C)	Differentiate between sub to each.	stitutional & interstitial solid solutions. Also give one example			
8 (A) 8 (B)	Neatly sketch labelled Ire cast iron and steel. Compute the Atomic Pac number.	on-Cementite phase diagram. Show the composition range of eking Factor for the BCC unit cell and write its coordination	2		
8 (C)	Give the differences between	een homogeneous and heterogeneous solidification.	3		
4 (A) 4 (B)	With neat sketches expla steel in End Quench Test. Explain the following:	in the procedure to plot the hardenability curves for eutectoid	Z		
. /	i) White cast iron ii)) Nitriding			

Reg. No.

1 (A)

1 (B)

1 (C)

2 (A)

2 (B)

2 (C)

3 (A)

3 (B)

3 (C)

4 (A)

4 (B)

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4 (C)	Write short notes on the following.		
	i) Tempering treatment ii) Normalising treatment.	3	
5 (A)	Write short notes on i) Brass ii) Ionic defect.	4	
5 (B)	Draw the ideal phase diagrams and write the invariant reaction involved in:		
	(i) Peritectic System and (ii) Eutectoid System.	3	
5 (C)	What is Critical Cooling Rate (CCR)? Show the CCR on the labelled TTT diagram.	3	
