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Coc	le No: R22035	(R10)	(SET - 1)		
	II B. Tech I MET	I Semester Regular Examinations, August -2014 ALLURGY AND MATERIAL SCIENCE (Com. to ME, AME, MM)			
Tin	ne: 3 hours	Μ	ax. Marks: 75		
		Answer any FIVE Questions All Questions carry Equal Marks			
1.	a) Explain crystallization [process in pure metals.			
	b) What is bonding energy	y, bond length and atomic radii? Explain them.	(7M+8M)		
2.	a) Distinguish between intb) What are the conditions another? Explain them.	erstitial compounds and interstitial solid solutions. that are favourable for extensive solid solubility of one	e element in (8M+7M)		
3.	a) What do you understandb) What is lever rule? Exp	d by the term equilibrium diagram? Explain with an exa lain how it is useful.	ample. (8M+7M)		
4.	a) Write the classification	of steels.			
	b) Explain the microstruct	ure, properties and applications of Spheroidal cast iron.	(8M+7M)		
5.	Explain the following:	C. La			
	i) Cryogenic treatment of a	alloys			
	ii) Hardenability	E Car	(8M+7M)		
6.	Explain the structure and p	properties of copper and its alloys.	(15M)		
7.	a) Write the properties and	applications of crystalline ceramics.			
	b) How are ceramic compo	onents formed? Explain.	(8M+7M)		
8.	a) What factors do influence the final properties of composites?				
	b) What is a hybrid compo- normal fibre composite	osite? Mention two important advantages of hybrid com s.	posites over (7M+8M)		



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Coo	le No: R22035 (R10)	(SET - 2)
Tin	II B. Tech II Semester Regular Examinations, August -2014 METALLURGY AND MATERIAL SCIENCE (Com. to ME, AME, MM) ne: 3 hours	Max. Marks: 75
	Answer any FIVE Ouestions	
	All Questions carry Equal Marks	
1.	a) Discuss various types of bonds in solids and explain them.	
	b) Explain the effect of grain boundaries on the properties of metals/alloys.	(8M+7M)
2.	a) Distinguish between alloy and alloy system with suitable examples.	
	b) Explain Hume Rotherys rules in detail.	(8M+7M)
3.	a) Explain the various applications of phase diagrams.	
	b) Describe peritectic system with an example.	(8M+7M)
4.	a) Explain the structure and properties of plain carbon steels.	(7M+8M)
	b) Write a short note on the following:	
	i) Hadfield manganese steels	
	ii) Malleable cast iron	
5.	a) Normalized steels are stronger than annealed steels. Explain.	
	b) Explain the effect of alloying elements on Fe-Fe3C system.	(8M+7M)
5 .	a) Explain the important features of alpha and alpha-beta alloys of titanium.	
	b) Why do aluminium alloys respond to age hardening? Give some examples.	(8M+7M)
7.	a) Write the properties and applications of cermets.	
	b) Describe two methods for preparing ceramic raw materials for processing.	(8M+7M)
8.	a) Explain the various methods of component manufacture of composites.	c
	b) What is MMC? Where are they used? Classify the MMCs according to the ty	ype of
	remorcement.	$(\delta M + /M)$



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	II B. Tech II Semester Regular Examinations, August -2014	
	METALLURGY AND MATERIAL SCIENCE	
Tin	(Com. to ME, AME, MM)	Max Marke 75
1 111	Answer any FIVE Questions	Wax. Warks. 75
	All Questions carry Equal Marks	
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1.	a) Explain why we should study the crystal structure of metals.	
	b) Discuss various types of crystal imperfections, with the help of neat sketches	s. (8M+7M)
2.	a) Explain types of solid solutions in detail.	(7M+8M)
	b) Write a short note on the following:	
	i) Intermediate alloy phases	
	ii) Electron compounds	
3.	a) Explain eutectic system with an example.	
	b) Discuss the Gibbs phase rule in detail.	(8M+7M)
1	a) Explain the structure properties and applications of White east iron	
4.	b) Write a short note on the following:	(7M+8M)
	i) Tool and die steels	(/10110101)
	ii) Low alloy steels	
5.	a) Explain surface hardening methods in detail.	
	b) Discuss the effect of alloying elements on hardenability.	(8M+7M)
6.	Explain the structure and properties of Aluminium and its alloys.	(15M)
7.	a) Write the properties and applications of nano materials.	
	b) Compare the properties of crystalline ceramics and glass ceramics.	(8M+7M)
0	a) Define the term composite and evaluin what are advanced composites? Cive	form or or or of the second
ð.	a) Define the term composite and explain what are advanced composites? Give	(7M + 8M)
	b) Explain the following.	$(1 \mathbf{v} 1 \mathbf{v} 1 \mathbf{v} 1 \mathbf{v} 1)$
	i) C-C composites	



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Code N	No: R22035 (R10)	(SET - 4)		
	II B. Tech II Semester Regular Examinations, Au METALLURGY AND MATERIAL SCIEN (Com. to ME. AME. MM)	gust -2014 NCE		
Time: 3	3 hours	Max. Marks: 75		
	Answer any <b>FIVE</b> Questions All Questions carry <b>Equal</b> Marks			
1. a)]	Describe the reasons for high thermal and electrical conductivity	y in metallic bonded solids.		
b)	Write the properties of covalent bonded solids.	(8M+7M)		
2. a)'	Write short notes on Hume-Rothery's rules.			
b)	What is an intermediate alloy phases. Explain in detail.	(8M+7M)		
3. Ex	plain the following:	(5M+5M+5M)		
i) I	somorphous alloy systems			
ii)	Equilibrium cooling and heating of alloys			
111)	Lever rule			
4. a)]	a) Explain the difference in microstructure and properties of white and grey cast iron.			
b)	Compare the properties of plain carbon steels with those of allog	y steels. (8M+7M)		
с Би	plain the following:	(914 - 714)		
i, $Ex$	Age hardening treatment			
ii)	TTT diagrams			
- D'		. 1		
$\mathbf{D}_{19}$	scuss the various types of titanium alloys giving their compositi	on, properties and uses. (15M)		
7. a)'	What is Nano material? Explain its applications.	(10111)		
b) [•]	Write the properties and applications of abrasive materials.	(8M+7M)		
8. a)]	Explain the classification of composites in detail.	(7M+8M)		
b) '	Write a short on the following:			
	i) Particle reinforced materials			
	ii) Metal matrix composite			