GUJARAT TECHNOLOGICAL UNIVERSIT BE - SEMESTERV(New) • EXAMINATION - WINTER 20 Subject Code:2152106         Subject Code:2152106         Dat         Subject Name:Physical Metallurgy         Time:10:30 AM to 01:00 PM         To         Instructions:         1         AM to 01:00 PM         To         Instructions:         To         To         Short Questions         1         What is atomic packing factor?         2         Define unit cell?         3       Dat	FY )16 e:24/11/2016 tal Marks: 70
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<b>13</b> Define critical temperature	
15 Denne entieur temperature.	
<b>14</b> Draw crystal planes in a cubil unit cell for (011) and (001)	
<b>Q.2</b> (a) Derive APF for FCC and BCC.	03
(b) Write note on solidification of pure metals.	04
(c) Draw and explain cooling curves for pure metal, for binary	07
solid solutions and for binary eutectic systems.	
OR	. –
(c) Explain progressive and directional solidification to obtain	07
sound castings. $\mathbf{O}_{\mathbf{a}}$ (a) Draw binary system of A1 Si	02
(b) Enlist the factors that affect the solid solubility by substitution	03
(b) Explain any one.	04
(c) Draw, sketch and label Iron-Iron carbide equilibrium diagram.	07
Explain various phases and transformation reactions.	
OR	
Q.3 (a) Draw binary system for Cu-Ni alloy	03
(b) Write effect of Alloying elements on properties of steel.	04
(c) What are different methods used for grain size measurement.	07
Explain any one of it. $\mathbf{O}(\mathbf{A})$ Write affect of impurities on properties of steel	02
(b) What are different system used for designation of steel. Explain	03
coding of steel according to IS standard and American standard.	04
(c) Write briefly about composition, properties, treatment,	07
microstructure and application of Gray cast iron.	
OR	
Q.4 (a) Draw and label Metallurgical microscope	0.2
(b) Enlist advantages and dis advantages of plain 'C' steel.	03
(c) What is Metallography? Explain briefly various steps of	03 04
metallography techniques.	03 04 07
<b>Q.5</b> (a) Write in brief about allotropy of Iron.	03 04 07

	<b>(b)</b>	Differentiate between macroscopic and microscopic	04
		examination methods.	
	(c)	Write short note on Ductile Cast Iron.	07
		OR	
Q.5	<b>(a)</b>	Discuss briefly about electrolytic etching.	03
-	<b>(b</b> )	Explain etching. Give examples of different etchants use for metal &alloys.	04
	(c)	Short notes on Inclusion rating.	07
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