

Total No of Questions: [VIII]

SEAT NO.

[Total No. of Pages : III]

S.E. 2012 (Mechanical Engg.)

Engineering metallurgy

(Semester - II)

Time: 2 Hours

Max. Marks : 50

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of Calculator is allowed.
- 5) Assume Suitable data if necessary
- 6) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 , Q7 or Q8

Q1)	a)	What are the advantages of alloy steels over plain carbon steel	[04]
	b)	Draw an equilibrium diagram for Ag-Cu system which are partially soluble in the solid state. The data is as follows:- Melting temp. of Ag - 961°C, Melting temp. of Cu - 1083°C, Eutectic composition - 28.1% Cu, Eutectic temp. - 780°C, Solubility of Cu in Ag - 8.8% Cu at 780°C, Solubility of Ag in Cu - 92.1% Cu. The solubility in both decreases to 2% at room temperature. Discuss slow cooling of alloy with 6% Cu from liquidus temperature.	[06]
	c)	Explain the weld decay in stainless steels	[03]
		OR	
Q2)	a)	Draw Iron carbon equilibrium diagram	[04]
	b)	Draw the microstructures of : 1) AISI 1020 steel	[02]
	c)	State the Hume Rothery's rules of solid solubility	[04]
	d)	What is coring? Which alloys show cored structures?	[03]
Q3)	a)	Explain secondary hardening	[02]
	b)	What are the advantages and disadvantages of Induction hardening over Flame hardening	[04]
	c)	Explain how corrosion can be prevented by taking care in proper design	[3]
	d)	Explain what is anodic protection	[3]
		OR	
Q4)	a)	Draw self explanatory diagram for any one of the below 1] Ausforming 2] Martempering	[02]
	b)	Write short notes on (Any one) : 1] Carbonitriding 2] nitriding	[04]
	c)	Explain min 4 types of corrosion .	[04]
	d)	What is cathodic inhibitors	[02]
Q5)	a)	What is chilled cast Iron ,how it is produced? Give its applications ?	[04]
	b)	Draw microstructure : 1] Ferritic Spheroidal gray cast iron, 2) 4.3 eutectic cast Iron	[04]
	c)	Explain the cooling of 3.5 % carbon cast Iron from its melting temperature till room temperature.	[04]
		OR	

Q6)	a)	What is Equivalent carbon in cast Iron. Explain role of individual element present in Equivalent carbon in cast iron .	[04]
	b)	Compare S.G. iron and Malleable iron with respect to microstructure, production, composition and one application each.	[04]
	c)	What are the advantages of cast iron over steels?	[04]
Q7)	a)	Give typical composition, property and application for the following (any four) : 1] LM14 2]Invar 3]statuary bronze 4]cartridge brass 5) Gun metal	[12]
	b)	Ni is used in measuring equipment justify its property for this application .	[1]
		OR	
Q8)	a)	Explain classification of Cu base alloys based on the percentage of Cu and Zn? Explain role of Zn in brasses	[04]
	b)	Write short note on 1) Dezincification 2)coring in Sn bronzes	[04]
	c)	What are the requirements of bearing materials ? explain with suitable example	[05]