## B.Tech. SEM -V Production 2014 Course (CBCS): WINTER - 2018 SUBJECT: ENGINEERING METALLURGY

Time: 02.30 PM TO 05.30 PM Day Thursday Date: 29/11/2018 W-2018-2428 Max. Marks: 60 N. B.: 1) All questions are **COMPULSORY**. 2) Figures to the right indicate FULL marks. 3) Draw neat and labeled diagrams WHEREVER necessary. 4) Assume suitable data, if necessary Q. 1 Describe the production of Pig Irons in details. a) (05)Explain the AISI and IS specification of steels. (05)OR By use of Iron Fe<sub>3</sub>C diagram find out the amount of phases for AISI 1020, (05)a) AISI 1060 and AISI 1090 steels. Draw the microstructure of these steels. List and Explain the importance of macro examination tests. (05)Q. 2 a) What is nodular Cast Iron? How is it manufactured? Write its applications. (05)Suggest suitable Cast Iron for following components with its chemical (05)b) composition: i) Break Drum Die Block ii) Melting crushable iii) Cylinder block iv) Road roller v) OR Explain the role of cooling rate and effect of alloying element C, Si, S, P and (05)Mn on microstructure of Cast Irons. b) Give the chemical compositions and applications of following materials: (05)ii) Ni – Hard C.I. i) Ferritic S. G. Iron Summarize different types of tool steels. (05)Q. 3 What is mean by "Ferritic stainless steels"? Give its properties and (05)b) applications. OR Explain the heat treatment cycle for 18:4:1 grade tool steels in details. (05)Write a short note on: (05)b) Austenitic stainless steel ii) HSLA tool steel i)

a)	Draw the time-temperature transformation diagram for Eutectoid steel and show the following cooling curves on it:				(05)
	i)	Ausforming	iii)	Normalizing	
	ii)	Martempering	iv)	Oil quenching	
b)	What is tempering of steels? Give its types.				(05)
		OF	ł		
a)	What do you know about Retained Austenite? Is it useful? How it is minimized?				(05)
b)	List out the factors depends on Hardenability. Why low carbon steels show low hardenability?				(05)
a)	Describe the nitriding as case hardening heat treatment in details.				(05)
b)	Write short note of Exothermic and endothermic atmosphere.				(05)
a)	Draw neat sketch of salt bath furnace list out its advantages and limitations as it is used in case hardening heat treatment.				(05)
b)	What is Induction Hardening? How it is carried out? Where it is used?				(05)
a)	Give the chemical content and its properties:				(05)
	<ul> <li>i) Muntz metal</li> <li>ii) Phosphorus Bronze</li> <li>iii) Cartridge brass</li> <li>iv) Silicon bronze</li> <li>v) Duralumin alloy</li> </ul>				
b)	What do you know about Cu-Sn bronzes? Gives their types and uses.				(05)
-		OI	2		
a)	Write the different types of brasses with its properties.				(05)
b)	Give the materials uses in bearing applications, list out its requirements.				(05)
	b) a) b) a) b) a) b) a)	show i) ii) b) Wh a) Wh min b) List low a) Des b) Wri a) Dra as ii b) Wh a) Giv ii) iii) iii) iv) v) b) Wh	show the following cooling curves on i) Ausforming ii) Martempering  b) What is tempering of steels? Give its  OF a) What do you know about Retained Arminimized?  b) List out the factors depends on Harde low hardenability?  a) Describe the nitriding as case hardeni b) Write short note of Exothermic and endors of the sait is used in case hardening heat tree as it is used in case hardening? How it b) What is Induction Hardening? How it a) Give the chemical content and its pro i) Muntz metal ii) Phosphorus Bronze iii) Cartridge brass iv) Silicon bronze v) Duralumin alloy  b) What do you know about Cu-Sn bronce OF a) Write the different types of brasses we	show the following cooling curves on it:  i) Ausforming iii) ii) Martempering iv)  b) What is tempering of steels? Give its types OR  a) What do you know about Retained Austernminimized?  b) List out the factors depends on Hardenabillow hardenability?  a) Describe the nitriding as case hardening he) Write short note of Exothermic and endoth OR  a) Draw neat sketch of salt bath furnace list of as it is used in case hardening heat treatment is used in case hardening? How it is case in the company of the company o	show the following cooling curves on it:  i) Ausforming iii) Normalizing ii) Martempering iv) Oil quenching  b) What is tempering of steels? Give its types.  OR  a) What do you know about Retained Austenite? Is it useful? How it is minimized?  b) List out the factors depends on Hardenability. Why low carbon steels show low hardenability?  a) Describe the nitriding as case hardening heat treatment in details.  b) Write short note of Exothermic and endothermic atmosphere.  OR  a) Draw neat sketch of salt bath furnace list out its advantages and limitations as it is used in case hardening heat treatment.  b) What is Induction Hardening? How it is carried out? Where it is used?  a) Give the chemical content and its properties:  i) Muntz metal ii) Phosphorus Bronze iii) Cartridge brass iv) Silicon bronze v) Duralumin alloy  b) What do you know about Cu-Sn bronzes? Gives their types and uses.  OR  a) Write the different types of brasses with its properties.

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