

B.Tech. SEM -V Production 2014 Course (CBCS) : WINTER - 2018

SUBJECT : ENGINEERING METALLURGY

Day Thursday
Date: 29/11/2018

W-2018-2428

Time : 02.30 PM TO 05.30 PM
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
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Q. 1 a) Describe the production of Pig Irons in details. **(05)**

b) Explain the AISI and IS specification of steels. **(05)**

OR

a) By use of Iron Fe₃C diagram find out the amount of phases for AISI 1020, AISI 1060 and AISI 1090 steels. Draw the microstructure of these steels. **(05)**

b) 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)**

b) Suggest suitable Cast Iron for following components with its chemical composition: **(05)**

- i)** Break Drum
- ii)** Die Block
- iii)** Melting crushable
- iv)** Cylinder block
- v)** Road roller

OR

a) Explain the role of cooling rate and effect of alloying element C, Si, S, P and Mn on microstructure of Cast Irons. **(05)**

b) Give the chemical compositions and applications of following materials: **(05)**

- i)** Ferritic S. G. Iron
- ii)** Ni – Hard C.I.

Q. 3 a) Summarize different types of tool steels. **(05)**

b) What is mean by “Ferritic stainless steels”? Give its properties and applications. **(05)**

OR

a) Explain the heat treatment cycle for 18:4:1 grade tool steels in details. **(05)**

b) Write a short note on: **(05)**

- i)** Austenitic stainless steel
- ii)** HSLA tool steel

P. T. O.

- Q. 4** a) Draw the time-temperature transformation diagram for Eutectoid steel and show the following cooling curves on it: (05)
- i) Ausforming
 - ii) Martempering
 - iii) Normalizing
 - iv) Oil quenching

- b) What is tempering of steels? Give its types. (05)

OR

- 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)

- Q. 5** a) Describe the nitriding as case hardening heat treatment in details. (05)

- b) Write short note of Exothermic and endothermic atmosphere. (05)

OR

- 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)

- Q. 6** a) Give the chemical content and its properties: (05)

- i) Muntz metal
- ii) Phosphorus Bronze
- iii) Cartridge brass
- iv) Silicon bronze
- v) Duralumin alloy

- b) What do you know about Cu-Sn bronzes? Give their types and uses. (05)

OR

- a) Write the different types of brasses with its properties. (05)

- b) Give the materials uses in bearing applications, list out its requirements. (05)

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