SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | Total number of pages:[2]

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May 2018

B.Tech. || ME || 3rd Sem

Enggineering Materials &Metallurgy

Reappear.

Subject Code: BTME-306A/306

2011 Batch onwards

Paper ID: **(for office use)**

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory.**
- **Assume any missing data.**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

(a) What is phase rule?

(b) What do you mean by diffusion mechanism? What is its effect?

(c) What is difference between defect and dislocation? Illustrate briefly.

(d) How will you describe the phenomenon of twining? How it is affecting the structure of a material.

(e) What is difference between induction and flame hardening?

(f) How will you differentiate annealing from normalizing process?

(g What is difference between case hardening and surface hardening?

(h) How will you differentiate between polymorphism and allotropy?

(i) What do you mean by microstructure and macrostructure study of a material?

(j) What is effect of addition of chromium and aluminum in a material?

PART B (8×5)

Q. 2. What do you mean by equilibrium diagram? Describe the equilibrium diagram of a binary system with the help of neat diagram. COa

OR

Describe the various phase transformation which are occurring due to metallurgical variations in a metal/ alloy with suitable illustration. COa

Q. 3. What do you mean by term Carbon equivalent? How it is affected by various alloying elements. What is its significance? Discuss in details. COb

OR

Explain the difference between terms hardening and hardenability. Describe the detailed effect of preheating and post heat treatment on the properties of material. COb

Q. 4. Describe the Iron-Iron Carbide equilibrium diagram with the help of a neat sketch, also explain its importance and application in metallurgy. COc

OR

Explain the Time Temperature Transformation diagram and its importance in COc

metallurgy. Describe how it is affecting the CCT curves.

Q. 5. What are various heat treatment processes? Describe the various heat treatment processes in detail along with their necessity. CO4

OR

What do you mean by Jominy end quench test? Describe detailed procedure for performing this test and also write its applications. CO4

Q. 6. How will you differentiate metals and alloys? Also discuss the effect of addition of various alloying elements in metals. CO5

OR

What are important properties of steel? Describe how structure of steel affects these properties. CO5