

**GANPAT UNIVERSITY**  
**B.TECH SEM. V (ME/MC/ME-Int.) ENGINEERING**  
**CBCS REGULAR EXAMINATION NOV/DEC-2016**  
**2MES01 MATERIAL TECHNOLOGY**

Time: 3 Hours

Total Marks: 60

**Instructions:**

- 1). All questions are **compulsory**.
- 2). Figures to the **right** indicate full marks.
- 3). Answers to the two sections must be written in **separate** answer books.

**SECTION - I****Que:-1**

- (A) Define and explain lever arm principle. [03]  
 (B) Define following reactions: [03]  
     1) Eutectic reaction    2) Eutectoid reaction    3) Solid solution  
 (C) Draw a neat sketch of Fe-Fe<sub>3</sub>C equilibrium diagram and label the phases there in. [04]

**OR****Que:-1**

- (A) What is meant by allotropic transformation? Explain allotropic transformation of pure iron. [03]  
 (B) Explain the different steps for specimen preparation for metallurgical examination. [03]  
 (C) Explain full annealing and spheroidizing process in detail. [04]

**Que:-2**

- (A) Explain importance of T.T.T diagram with respect to heat treatment of steel. Also define critical cooling rate. [03]  
 (B) Define following terms: [03]  
     1) Temper colour    2) Temper brittleness    3) Martensite  
 (C) What is tempering? Explain different type of tempering process. [04]

**OR****Que:-2**

- (A) What is carburizing process? Differentiate between pack carburizing and gas carburizing process. [03]  
 (B) What is the use of case hardening process? Explain flame hardening process with neat sketch. [03]  
 (C) What is malleable cast iron? Explain manufactures of white cast iron. Enlist applications of white cast iron. [04]

**Que:-3**

- (A) Explain effects of following alloying elements on properties of steel: [04]  
     1) Chromium    2) Manganese    3) Nickel    4) Cobalt  
 (B) Write short note on copper alloys. [03]  
 (C) What is hardening process? Why hardening is always followed by tempering process? [03]

**SECTION - II**

- Que:-4**
- (A) Define powder metallurgy. Describe any two powder production methods in powder metallurgy process. [04]
  - (B) Why blending and mixing process is required before compacting in powder metallurgy process? [03]
  - (C) Enlist various characteristics and applications of nano materials. [03]

**OR**

- Que:-4**
- (A) Explain basic steps in powder metallurgy with one example. [04]
  - (B) What is compacting? Differentiate between pre-sintering and sintering operation. [03]
  - (C) Define ceramic and explain classification of ceramic materials. [03]

- Que:-5**
- (A) What is corrosion? Enlist corrosion prevention techniques. Explain any two in detail. [10]
  - (B) Explain fretting corrosion with its mechanism? [03]

**OR**

- Que:-5**
- (A) Classify polymerization processes and give the difference between addition and condensation polymerization. [10]
  - (B) Differentiate between thermoplastics and thermosetting material along with applications.

- Que:-6**
- (A) Explain the classification of refractories. Write short note on basic refractories. [04]
  - (B) Discuss the pultrusion process in detail. [03]
  - (C) What is composite? Explain the large particle composite with examples. [03]

**END OF PAPER**