

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Summer 2018 - 19 Examination**

**Semester: 4****Subject Code: 03113251****Subject Name: Engineering Materials And Metallurgy****Date: 13/05/2019****Time: 2:00pm to 4:30pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions - ( Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) (15)**

1. Metallography is useful to evolve,  
1) Microstructure 2) mechanical properties 3) thermal properties 4) electrical properties
2. Developer liquid is useful in which of the test.  
1) Magnetic particle test 2) Liquid penetration test  
3) Ultrasonic test 4) Radiography test
3. The ability of material to withstand scratch and wear force is called  
1) Hardness 2) strength 3) toughness 4) ductility
4. Pearlite is the combination of,  
1) Ferrite + cementite 2) Ferrite + austenite  
3) Austenite + sorbite 4) martensite + ferrite
5. Which is not a mechanical properties  
1) Ductility 2) Hardness 3) conductivity 4) ductility
6. Martensite structure improves the  
1) Ductility 2) malleability 3) hardness 4) toughness
7. Brass and bronze is an alloys of  
1) Zinc 2) copper 3) aluminium 4) nickel
8. Bronze is an alloy of  
1) Copper + Tin 2) copper + zinc  
3) copper + lead 4) copper + manganese
9. The material with less than 2 % carbon is called as,  
1) iron 2) steel 3) aluminium 4) copper
10. The space shuttle is covered with special tiles of materials. Give the name of that material,  
1) Metal 2) polymer 3) ceramic 4) semiconductor
11. Chromium will increase the  
1) Chemical Reactivity 2) corrosion resistivity 3) ductility 4) resilience
12. Melting temperature of iron is  
1) 1700 2) 1539 3) 950 4) 2000
13. Steel can be hardened by which process,  
1) Annealing 2) normalizing 3) hardening 4) tempering

14. The crystal structure of austenite is,  
1) F.C.C. 2) B.C.C. 3) S.C. 4) H.C.P.

15 The material having more than 2 % of carbon is known as,  
1) Steel 2) cast iron 3) bronze 4) tool steel

**Q.2** Answer the following questions. (Attempt any three) **(15)**

- A) Draw the structure of SC, BCC and FCC along with its atomic radius and coordination number.
- B) Explain Characteristics of powders used in powder metallurgy. Also explain any Three methods of powder production.
- C) Explain the types of dislocation with neat sketch.
- D) Explain with the help of neat sketch how deformation by slip occurs in solid metals.

**Q.3** A) What is hardenability? Discuss about jominy-end quenching test method for measurement of hardenability. **(07)**

B) Write down about copper and its any five types of alloys. **(08)**

**OR**

B) Draw the TTT diagram with neat sketch. **(08)**

**Q.4** A) Explain the Liquid Penetrating testing with neat sketch. **(07)**

**OR**

A) Explain Types of solid solution along with Hume Rothery Rule. **(07)**

B) Draw the Iron- Carbon diagram in detail and write down the eutectic reaction. **(08)**