

Total No. of Questions : 8]

SEAT No. :

PB-3709

[Total No. of Pages : 2

[6261]-118

**S.E. (Robotics & Automation Engineering)  
MATERIAL SCIENCE AND ENGINEERING  
METALLURGY**

**(2019 Pattern) (Semester - III) (211503)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8*
- 2) *Assume Suitable data if necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw neat figures whenever necessary*
- 5) *Use of scientific calculators is allowed.*
- 6) *Use of cell phone is prohibited in the examination hall.*

**Q1) a) What is powder Metallurgy? Give its application? [8]**

**b) Explain Term: [8]**

- i) Refractory Metals.
- ii) Cemented carbide tipped tools.

OR

**Q2) a) Why it is necessary to control atmosphere during sintering? And also write down advantages of powder metallurgy. [8]**

**b) Write note on: [8]**

- i) Electrical Contact Materials.
- ii) Self-lubricating bearings.

**Q3) a) Write down the classification of steel on the basis of carbon content and also give two application of each. [10]**

**b) What are stainless steel? Give typical composition and two uses of various types of stainless steel. [8]**

OR

**P.T.O.**

**Q4) a)** What is steel? What do you understand by eutectoid, hypereutectoid and hypoeutectoid steel? [10]

b) Write down effects of various parameters on structures and properties of cast irons. [8]

**Q5) a)** What is retained austenite? Why it is not desirable? [10]

b) Explain terms: [8]

i) Quenching.

ii) Carburizing.

OR

**Q6) a)** Explain the method of plotting TTT diagram and what information is obtained from this diagram? [9]

b) What is purpose of Tempering? Give its classification and explain types of tempering heat treatment process [9]

**Q7) a)** What is equivalent zinc of a brass? Explain its significance and usefulness. [10]

b) Write note on [8]

i) Composite materials.

ii) Super Alloys

OR

**Q8) a)** Write Note on Aluminum and its Alloy. [9]

b) Give composition and properties of any three bearing materials. [9]

