

Total No. of Questions : 8]

SEAT No. :

PD4152

[6402]-113

[Total No. of Pages : 2

S.E. (Robotics & Automation Engineering)

MATERIALS 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 conditioning of metal powders? Why is it done? **[8]**

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

- i) Electrical Contact Materials.
- ii) Cermets.

OR

Q2) a) Write down the process of powder metallurgy in brief. **[8]**

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

- i) Diamond impregnated Cutting Tools.
- ii) Cemented carbide tipped tools.

Q3) a) What is steel? What is meant by eutectoid, hypereutectoid and hypoeutectoid steel also draw its microstructure? **[10]**

b) Classify Cast Iron? And give its application. **[8]**

OR

P.T.O.

Q4) a) Define following. [10]

- i) Ferrite
- ii) Austenite
- iii) Pearlite
- iv) Cementite
- v) Bainite

b) Explain the following with neat diagram : [8]

- i) Sensitization of steel.
- ii) Eutectic transformation.

Q5) a) Write note on Transformation products of austenite. [9]

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

OR

Q6) a) What is temper embrittlement? How it is avoided? [9]

b) Write note on : [9]

- i) Carburizing.
- ii) Nitriding.
- iii) Carbonitriding.

Q7) a) Give composition and properties of any three bearing materials. [9]

b) Write Note on Composite Material and Sports Materials. [9]

OR

Q8) a) Write note on Super alloy. [9]

b) Write Note on Aluminum and its Alloy. [9]

