

Total No. of Questions : 8]

SEAT No. :

P714

[Total No. of Pages : 2

[5869]-385

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? Discuss advantage and disadvantage. [8]

b) Explain term : [8]

- i) Self-lubricating bearings
- ii) Cermets

OR

Q2) a) Write note on : [8]

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

b) Describe any two component which can be manufactured by only powder metallurgy. [8]

Q3) a) Define following [10]

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

b) Draw Fe-C equilibrium diagram and label the temperature, compositions and phase. [8]

OR

P.T.O.

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

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

i) Peritectic transformation

ii) Eutectic transformation

Q5) a) Draw and explain the method of plotting TTT diagram and what information is obtained from this diagram? [10]

b) Explain terms : [8]

i) Quenching

ii) Annealing

iii) Normalizing

iv) Carburizing

OR

Q6) a) Define hardenability. How it is measured? [8]

b) What is retained austenite? Why it is not desirable? [10]

Q7) a) Write note on High temperature alloy. [9]

b) Write note on Copper and its Alloy. [9]

OR

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

b) Write note on Composite Material and Nano Materials. [9]
