Total No. of Questions : 8]

SEAT No. :

P-1608

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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 powder Metallurgy? Give its application? **[8]**

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

i) Electrical Contact Materials

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) Diamond impregnated Cuffing Tools

ii) Self-lubricating bearings.

Q3) a) Define following. **[10]**

i) Ferrite ii) Austenite

iii) Pearlite iv) Cementite

v) Bainite

P.T.O.

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

OR

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

b) Classify C.I.? And give its application. **[8]**

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

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

i) Quenching

ii) Annealing

OR

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

b) Write note on : **[9]**

i) Flame Hardening

ii) Nitriding

iii) Carbonitriding

Q7) a) What is equivalent zinc of a brass? Explain its significance and usefulness. **[9]**

b) Write note on : **[9]**

i) Composite materials.

ii) Nano-materials.

iii) Sports materials.

OR

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

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