Total No. of Questions – [8] Total No. of Printed Pages 02

G.R. No.	

U218-156 (ESE)

DECEMBER 2018/ENDSEM

S. Y. B. TECH. (MECH ENGG) (SEMESTER - I)

COURSE NAME: MATERIAL SCIENCE AND ENGINEERING METALLURGY

COURSE CODE: MEUA21176

(PATTERN 2017)

Time: [**2 Hours**], [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) a) What do you mean by 'imperfections in crystal'? Explain min three types with Suitable example for each. [6 marks]

OR

b) Examine is there any relation between metal structure and its coordination no? Show it for BCC structure? [6 marks]

Q.2) a) What is slip in plastic deformation? Compare the slip & twinning. [6 marks]

OR

b) Discuss factor affecting Fatigue strength and Fatigue f fracture? [6 marks]

Q.3) a) Draw the equilibrium diagram for the materials having 100% solubility in liquid and 0% in solid. Explain the cooling of an alloy having 45 % composition from its melting temperature to room temperature [6 marks]

OR

a) Explain the flow line detection. [6 marks]

Q.4) a) Discuss the transformation of any hypo eutectoid steel from its AC3 temperature till the room temp [4 marks]

OR

b) Draw the microstructure of AISI 1045 and AISI 1075 [4 marks]

Q. 5) a) Define O and T and W series with reference to tool steel? [6 marks]
b) Define plain Carbon and alloy steel? [4 marks]
c) Determine the changes in pearlite and Martensite Transformation? [4 marks]

OR

Q.6) a) What is 1] White cast iron 2} Gray cast Iron 3] Malleable cast iron [6 marks]
b) Explain the transformation of Pearlite to Austenite with a neat diagram with its characteristics. [4 marks]
c) Draw the self-explanatory TTT diagram for AISI 1065 steel. [4 marks]

Q.7) a) Define 1.Hardening 2. Annealing 3.Normalising [6 marks]
b) What are the Annealing types explain the Full Annealing in detail [4 marks]
c) What are the advantages of cu base alloys? [4 marks]

OR

Q.8) a) Explain the cooling in all media with a proper diagram? Which gives fast cooling? Why? [6 marks]
b) Justify for the same metal the cooling method changes the structure. [4 marks]
c) What are the advantages of nonferrous cu alloys over cast iron. [4 marks]