Registration no: | | | | | | | | | | |

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B.TECH
BSMS1213

3rd Semester Back Examination 2016-17
MATERIAL SCIENCE AND ENGINEERING
BRANCH(S): ECE, EEE, EIE, ELECTRICAL, ETC, IEE
Time: 3 Hours
Max Marks: 70
Q.CODE: Y789

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Write down the clausius –mosotti equation .Explain the symbols.

b) Explain the phenenomenon of spontaneous polarization in ferroelectric material.

c) Difference Between the remenance and coerivity.
d) What is a Phonon ?Give an evidence for existence of Phonon.
e) Why is ionic polarisability found to be rather in sensitive to temperature?
f) When a material is said to be nano material? What is its importance.

g) What do you Mean by the ceramic material
h) Distinguish between piezoelectrics and pyroelectrics
i) Write down four applications of ferrites.
j) What do you mean by the micro composite and macro composite?

Q2 **a)** Discuss classical free electron theory .Derive expression for electrical and thermal conductivity **(5)**

b) What do you mean by Condensation polymer? Discuss it mechanism with example **(5)**

Q3 **a)** Draw temperature dependence of susceptibility at all type of magnetic materials .Comments on them .Explain the Heisenberg's exchange interaction in ferromagnetism **(5)**

b) What do you mean by Addition polymerization ?Discuss it mechanism with example **(5)**

Q4 Explain the orgin of Diamagnetism in material .Obtain an expression for diamagnetic susceptibility using Langevinble theory .What is the significance of negative susceptibility? **(10)**

A Paramagnetic material contains 8.5x1026 ion /m3 with magnetic moment of $0.25\mu_B$ .Calculate the magnetization under the action of magnetic induction 1.5 Tesla at 300K.

Q5 **a)** Distinguish between stimulated and spontaneous emission .State the conditions for laser action in crystal. **(5)**

b) What do you mean by conducting polymer? Discuss it with example. **(5)**

Q6 **a)** Discuss the difference type of optical fibers and their properties and Discuss the working of Fiber optics communication Link with Block Diagram. **(5)**

b) Describe the construction and working of Ruby laser with neat Diagram. **(5)**

Q7 **a)** What is Difference Between the Thermoplastic and Thermosets. **(5)**

b) What is B.C.S. theory of superconductivity? How this theory explains the formation of cooper pairs? **(5)**

Q8 **Write short notes on:** **(2.5 x 4)**

a) Polymer matrix composite and Large particle composite

b) Application of ceramic material

c) stress corrosion

d) Fiber-reinforcement composite(FRC)