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Total Number of Pages: 02

B.TECH
BSMS1213

3rd Semester Back Examination 2016-17
MATERIAL SCIENCE AND ENGINEERING

BRANCH: AEIE

Time: 3 Hours

Max Marks: 70

Q.CODE: Y545

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) Distinguish between stimulated and spontaneous emission
- b) What is Meisner's effect?
- c) Distinguish between polar and nonpolar dielectrics.
- d) Define conducting polymer?
- e) What do you mean by the Degree of polymerization?
- f) What do you mean by co-polymrsiation?
- g) What is isotope effect.
- h) Distinguish between piezoelectrics and pyroelectrics
- i) Write down four applications of ferrites.
- j) Calculate the current produced in a small germanium plate of area 1 cm^2 having thickness 0.3 mm when a potential difference of 2 V ia applied across the faces.

Q2 a) Discuss different breakdown mechanism in dielectrics. (6)

b) What are ferroelectrics? Draw and explain the ferroelectric hysteresis loop. (4)

Q3 a) What is B.C.S. theory of superconductivity? How this theory explains the formation of cooper pairs? (5)

b) What are high T_C superconductors? Give four examples. (5)

Q4 a) Discuss construction and working of He-Ne laser. (6)

b) What are optical fibers discuss its types .Write its four applications. (4)

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Q5 a) Compare between paramagnetic, diamagnetic and ferromagnetic materials. **(6)**

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b) Explain how a four level laser system works. **(4)**

Q6 a) What do you mean by the ceramic? Discuss the structure of ceramic. **(5)**

b) What do you mean by the soft glass? Discuss its properties and application. **(5)**

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Q7 a) A polymer sample consists of 20% by weight of macromolecule of molecular weight 10000 and 80% by weight of macromolecule with molecular weight 100000. Calculate M_n and M_w . **(5)**

b) Mention at least six characteristics of polymer? Discuss the advantages of polymer. **(5)**

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Q8 Write short notes on any TWO: **(5 x 2)**

- a) Conducting polymer
- b) Polymer matrix composite
- c) Particle reinforced composite
- d) Hybrid composite