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Total number of printed pages - 02

**B.TECH**  
**BSMS1209**

**3<sup>rd</sup> Semester Back Examination 2016 - 17**

**MATERIAL SCIENCE**

**BRANCH(S): CHEM, METTA, MME, PLASTIC**

**Time : 3 Hours**

**Max Marks : 70**

**Question Code : Y593**

**Answer Question No. 1 which is compulsory and any FIVE from the rest.**

**The figures in the right-hand margin indicate marks.**

**Assume suitable notations and any missing data wherever necessary.**

**Answer all parts of a question at a place.**

1. **Answer the following questions :** **2 x 10**
- (a) What is tensile strength ?
  - (b) Show graphically Stress vs. Strain curve and mention different remarkable points in the curve.
  - (c) What are the primary selection factors of the materials for devices ?
  - (d) Write the expression for electrical conductivity of metal in terms of mobility of electrons.
  - (e) What are the possible phenomena that may occur when light falls on a material ?
  - (f) What do you mean by forbidden energy gap ?
  - (g) What is the difference between light emitted from LED and from diode LASER ?
  - (h) What is the effect of pH on corrosion ?
  - (i) What is fiber reinforced composite ?
  - (j) What is the function of lime in clay ?
2. (a) Explain the postulates of Drude-Lorentz theory and establish the thermal and electrical conductivity of metal from it. **06**
- (b) Calculate de-Broglie wave length of an electron accelerated by a potential difference of 150 volt. **04**
3. (a) Distinguish between dia, para, ferro, and ferrimagnetic materials. Mention their properties. **07**
- (b) In a magnetic material, the field strength is found to be  $10^6$  amp/m. If the magnetic susceptibility of the material is  $0.5 \times 10^{-5}$ , calculate the intensity of magnetisation in the material. **03**

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4. (a) Describe the construction and working of He-Ne LASER. **06**  
(b) Write the different applications of LASER in the field of science and technology. **04**
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5. (a) What are ceramics? Briefly write the classification of ceramic materials. **06**  
(b) What do you mean by Ceramic-Matrix composites? **04**
6. (a) Explain in detail the various types of welding of plastics. **05**  
(b) What are the monomers of Nylon 6, 6? Write their structures. **05**
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7. (a) What are the different types of corrosions? Explain the mechanism of Pitting corrosion. **06**  
(b) Discuss the important methods for corrosion control. **04**
8. **Write short notes on any TWO: 5 x 2**  
(a) Superconductor  
(b) Extrinsic semiconductor  
(c) Optical fiber  
(d) Tufnol
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