Total No. of Questions :5] *[Total No. of Printed Pages :2*

EE - 302

B.E. III Semester

Examination, December 2015

Electrical Engineering Materials

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What is the silsbee's rule?
   b) Give the reason why telephone overhead lines are made of steel wires.
   c) What is the material used to make filament of the incandescement lamps and for what reasons?
   d) What are the electrical contact materials used in electrical industry? Explain.

OR

State the properties and applications of the following high resistivity materials.

i) Molybdenum ii) Platinum
iii) Tungsten iv) Mercury

Unit - II

2. a) Why do the energy levels of an isolated atom become energy band in a solid?
   b) Why n-type as well as p-type semiconductors are electrically neutral? Explain.
   c) Explain with suitable diagram the conduction band, valance band and forbidden energy band in solids.

   d) What is the difference in the band structure of an insulator, a semiconductor, and a conductor? In case of semiconductors indicate the donor and acceptor levels.

OR

Write the applications of semiconductor materials.

Unit - III

3. a) What are the magnetic materials?
   b) What do you understand by ferromagnetism?
   c) What is eddy current loss? Explain in brief. How these losses can be reduced?
   d) Draw and explain hysteresis curve and hysteresis loop. What do you understand by residual magnetism, retentivity and coercive force.

OR

What are soft magnetic materials? Explain with suitable examples with their properties.

Unit - IV

4. a) What is the difference between insulating materials and dielectric materials?
   b) Classify the solids according to polarizability.
   c) What is complex permittivity? Explain.
   d) Write the applications of dielectrics.

OR

Explain the term insulation resistance, dielectric constant and dielectric loss for insulating materials.

Unit - V

5. a) What are the various properties that an insulating material should possess?
   b) Give the properties of an ideal insulating oil.
   c) Classify synthetic resins.
   d) Write short note on ceramic insulating materials. Explain applications of ceramics.

OR

What are the effects of moisture on insulations? How can the insulator be protected from moisture?

******