

Roll No .....

**EX - 402****B.E. IV Semester**

Examination, December 2015

**Electrical and Electronics Materials****Time : Three Hours****rgpvonline.com****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 questions 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 happens when the carbon content in steel is increased and classify the types of steel?  
 b) State the desirable properties of high resistivity materials.  
 c) Write only the material used in the MHD generators.  
 d) Explain fuel cell giving greater emphases on the fuel used in it.

OR

Discuss the types of resistors and their applications.

**Unit - II**

2. a) List out the properties and applications of SF<sub>6</sub> gas.  
 b) Give reasons why the winding of power transformer are immersed in oil.  
 c) What is impregnated paper and its applications?  
 d) Mention the yield of application of the following insulating materials with reasons against each .  
     i) Fibre glass  
     ii) Mica  
     iii) Ceramics

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OR

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Give a brief comparison of various types of capacitors according to the dielectric material used in them.

**Unit - III**

3. a) What properties of a semiconductor are determined from a Hall effect?  
 b) What semiconductor material is used in LCD and its applications? **rgpvonline.com**  
 c) Give the name of some piezoelectric materials and their applications.  
 d) Discuss the following  
     i) Thermal conductivity of semiconductors  
     ii) Electrical conductivity of doped materials.

OR

Explain semiconductor laser its characteristics and applications.

**Unit - IV**

4. a) Give the classification of magnetic material with examples.  
 b) Why magnetostriction is a reversible process?  
 c) What are the advantages of ferrites over magnetic materials? Give the applications of ferrites.  
 d) What are the advantages and disadvantages of alloying steel with silicon for use as magnetic material in transformers and electrical machines?

OR

What are thermocouples and their applications? Name some materials which are used for the construction of thermocouples,

**Unit - V**

5. a) How isolation between components is obtained in an IC?  
 b) Name the different types of IC packages.  
 c) What is ion-implantation technique in IC fabrication and also give its advantages?  
 d) Explain the fabrication process of CMOS device.

OR

Explain the fabrication process of IC resistors.

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