B.TECH. SEM -IV ELECTRICAL 2014 COURSE (CBCS) :
SUMMER - 2018

SUBJECT: ELECTRICAL ENGINEERING MATERIALS

Day: **Tuesday** | **S-2018-2290** | Time: **10.00 AM TO 01.00 PM**
Date: **12/06/2018** | Max Marks: 60

N.B:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data, if necessary.

Q.1 **a)** Write down properties & applications of the following **(05)**
i) Materials used in precision work
ii) Materials used for Rheostat

b) Explain superconductivity & its applications. **(05)**

OR

a) State properties and applications of **(05)**
i) Aluminum
ii) Iron & steel

b) Write a short note on thermocouple. **(05)**

Q.2 **a)** Describe magnetic materials used for transformer core. **(05)**

b) Draw and Explain Susceptibility versus Temperature Curve in case of Ferromagnetism. **(05)**

OR

a) Explain the classification of magnetic materials. **(05)**

b) Differentiate between- **(05)**
i) Ferromagnetism and Antiferromagnetism.
ii) Soft magnetic materials and Hard magnetic materials.

Q.3 **a)** State the electrical applications of the following materials. Explain why these materials are suitable for the given applications. **(05)**
i) Mica
ii) Ceramics

b) Write down properties & applications of poly- vinyl chloride (PVC) & Silicons. **(05)**

OR

a) Write down properties & applications of- **(05)**
i) Paper
ii) Rubber

b) How insulating materials are classified. Give detail classification. **(05)**

Q.4 **a)** What is the difference between an insulator and a dielectric? Enumerate the factors that affect the dielectric loss. **(04)**

b) Explain the process of polarization of a dielectric. **(06)**

OR

a) What are photo resistors? Explain the structure of photo resistors. **(05)**

b) Describe the material used, construction, equivalent circuit, working and application of photo-emissive cells. **(05)**

Q.5 **a)** What is the concept of energy band? Discuss various conducting mechanisms in Nano- structures. **(06)**

b) Explain the structure, working and application of single electron transistor. **(04)**

OR

a) Write a short note on- **(05)**
i)BN nanotubes ii) Nano- wires

b) List out the application of Nano- materials in electrical engineering. **(05)**

Q.6 Explain the construction of inductors. What are the air cored and cored coils? Discuss about the types of cores & materials used for core. **(10)**

OR

Discuss in brief the materials used for electronic components. **(10)**

* * *

120618-m-engineering-pune