ROLL NO. _____

Code: DE54/DE104 Subject: ELECTRONIC ENGINEERING MATERIALS

DipIETE – ET (Current & New Scheme)

Time: 3 Hours **JUNE 2015** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. The temperature beyond which substances lose their ferroelectric properties, is known as

(A) Critical temperature **(B)** Curie temperature
(C) Inversion temperature **(D)** Conversion temperature

b. In ferromagnetic materials

(A) The atomic magnetic moments are antiparallel and unequal
(B) The atomic magnetic moments are parallel
(C) The constitute is iron only
(D) One if the constituent is iron

c. Which of the following is a semi-conductor material?

(A) Aluminium **(B)** Rubber
(C) Silicon **(D)** Phosphorous

d. Ferrite is associated with

(A) Ferromagnetic materials **(B)** Paramagnetic materials
(C) Diamagnetic materials **(D)** None of these

e. Metals approach super-conductivity conditions

(A) Near absolute zero temperature
(B) Near critical temperature
(C) A triple point
(D) Under the conditions of high temperature and pressure

f. Which of the following is ferro-electric material?

(A) Rochelle salt **(B)** Barium titanate
(C) Potassium dihydrogen phosphate **(D)** All of these

g. Thermionic emission occurs in

(A) Transistors **(B)** Ferrite cores
(C) Copper conductors **(D)** Semi-conductors

h. Variable resistors are generally

(A) Carbon resistors **(B)** Thin film resistors
(C) Thick film resistors **(D)** Wire wound resistors

i. Which of the following diode is designed to operate in the breakdown region?

(A) Signal diode **(B)** Power diode
(C) Zener diode **(D)** None of these

j. An FET has

(A) Very high input resistance **(B)** Very low input resistance
(C) High connection emitter junction **(D)** Forward biased PN junction

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Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Explain the effect of magnetic field on superconductor. **(8)**

b. Name and explain the factors on which resistivity of a conducting material depends. **(8)**

Q.3 a. Explain Ionic and Dipolar polarization. **(8)**

b. Explain Claussis Morotti relation. **(8)**

Q.4 a. Explain the terms dielectric losses and dielectric constant. **(8)**

b. What is Piezo-electricity? Explain in brief. **(8)**

Q.5 Differentiate between diamagnetic, Paramagnetic and ferromagnetic materials. Also give one example of each. **(16)**

Q.6 a. What are the different types of semiconductor? Explain n-type and p-type semiconductor with the help of energy band diagram. **(8)**

b. What is diffusion? Explain. **(8)**

Q.7 a. What is a PN junction? Draw and explain V-I Characteristics of PN Junction diode **(8)**

b. Explain the working of a tunnel diode. **(8)**

Q.8 a. What is voltage sensitive resistor? What are the different types of voltage sensitive resistors? **(8)**

b. What are variable capacitors? Explain in brief. **(8)**

Q.9 a. Explain the operation of JFET with low drain voltage and draw the drain characteristics. . **(8)**

b. Discuss epitaxial diffused junction diode and its application. **(8)**