Register Number: ……

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EIE103: Electronic Devices

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. In a N-type semiconductor

   A) holes are majority carriers B) holes are minority carriers

   C) electrons are minority carriers D) both electrons and holes are majority carriers.

2. The Cutin Voltage of Si Diode is

   A) 0 V B) 0.3V C) 0.6 V D) 0.8 V

3. The Icbo of Ge transistor at 40° C is 5 μA. Its value at 60ºC will be

   A) 10 μA B) 20 μA C) 40 μA D) 80 μA

4. In a Silicon CE transistor under Saturated condition, the voltage across the Collector and Emitter VCE (Sat) will be equal to

   A) 0.3 V B) 0.1 V C) 0.7 V D) Vcc

5. In the Enhancement MOSFET the value of IDSS will be in the order of

   A) μA. B) mA C) Amps D) Zero

6. UJT is constructed using

   A) N-type Silicon bar B) N-type Silicon bar with heavily doped P material

   C) P-type Silicon bar D) P-type Silicon bar with heavily doped N material

7. The minimum energy for photoelectric emission of a material having Threshold wavelength of 5500 Aº is

   A) 2 eV B) 3 eV C) 2.25 eV D) 2.8 eV

8. Photoconductive current is proportional to

   A) Intensity of Light only B) Life time of newly generated carriers only

   C) Electronic charge value only D) All the above factors.

9. SCR will come from ON State to Normal State only if

   A) Gate current made equal to zero B) Holding current made equal to zero

   C) Latching current made equal to zero D) Gate voltage is made equal to zero.

10. Zener breakdown occurs in

A) All PN Junction diodes. B) Tunnel diode

C) Lightly doped PN diode. D) Heavily doped PN diode.

PART B (10 x 2 = 20 Marks)

11. What is meant by Reverse Saturation Current in a diode?
12. Define static resistance of a diode.
13. Define β of a transistor.
14. What is meant by Early Effect in a transistor?
15. In a JFET IDSS = 9 mA. VGS (off) = -8 V. Find the Drain current ID for VGS = -1 V
16. Define Intrinsic Stand off ratio of UJT
17. Define Threshold wavelength of Photoelectric devices.
18. What is meant by Darlington Phototransistor?
19. Define Holding current in a SCR.
20. In what way the construction of Tunnel diode differs from PN Junction diode.

PART C (5x 14= 70 Marks)

21. a) (i) With the help of Diode current equation, explain the V-I characteristics of PN Junction diode under forward and reverse bias conditions. (8)

(ii) The Reverse Saturation current in a PN Germanium Diode is 10 μA. Find the Forward Current at a Forward Voltage of

(1) 0.10 Volts (2) 0.3 Volts. (6)

(OR)

b) (i) Derive an expression for the Forward Current of PN Junction Diode from the hole and electron current equations. (7)

(ii) Explain the Diode switching characteristics and discuss its effect on the speed of operation of the transistor. (7)

22. a) (i) Explain the principle of operation of PNP transistor. (6)

(ii) Define and explain C.E h-parameters of the transistor. (6)

(iii) Draw the C.E. h-parameter equivalent circuit of a transistor. (2)

(OR)

b) (i) Draw the C.E. output characteristics of NPN transistor and explain about Active region, Saturation region and Cut-off region. (7)

(ii) Write detailed notes on: Power Transistors (7)

23. a) (i) With a neat diagram and characteristics explain the operation of JFET. (7)

(ii) Explain the V-I Characteristics of UJT. (7)

(OR)

b)(i) With a neat diagram and characteristics explain the operation of Depletion-type MOSFET. (7)

(ii) With suitable characteristics explain the principle using FET as a Voltage Variable resistor. (7)

24. a)(i) Explain the principle and characteristics of Photodiode (7)

(ii) Explain the operation of Laser Diode. (7)

(OR)

b) (i) Give the constructional details and operation of LCD (7)

(ii) Write short notes on: 1. Photo conductive cell 2. Opto coupler. (7)

25. a) (i) With two transistor equivalent circuit explain the operation of SCR. (7)

(ii) Write short notes on : 1. Zener diode 2. Charge coupled devices. (7)

(OR)

b) (i) Explain the principle of operation of Tunnel Diode. (7)

(ii) Write short notes notes on: 1. PUT 2. Piezo Electric Effect. (7)

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