Register Number_____

B.E DEGREE EXAMINATION Oct/Nov 2009
III SEMESTER
ELECTRONICS AND INSTRUMENTATION
U07EI305 – ELECTRONIC DEVICES

Time : Three Hours Maximum marks: 100

Answer ALL Questions:-
PART A (10X1=10 Marks)

1. Semiconductor materials have _____ bonds.

   a. Ionic b. covalent c. mutual d. metallic

2. In the forward region of its characteristics, a diode appears as

   a. OFF Switch b. High resistance. c. capacitor d. ON switch

3. In a properly biased NPN transistor, most of the electrons from the emitter

   a. recombine with holes in the base

   b. recombine in the emitter itself

   c. passes through the base to the collector

   d. are stopped by the junction barrier.

4. When operated in cutoff and saturation region, the transistor acts like

   a. linear amplifier b. a switch
   c. a variable capacitor d. a variable resistor

5. A JFET always operate with

   a. drain connected to ground.

   b. gate to source junction is forward biased.

   c. gate to source is reverse biased.

   d. gate connected to the source.

6. A DE MOSFET differs from JFET in the sense that it has no

   a. channel c. P-N junction

   b. gate d. substrate

7. In a photoconductive cell, the resistance of the semiconductor material varies _____ with the intensity of incident light.

   a. directly b. inversely c. exponentially d. logarithmically

8. A solar cell operates on the principle of

   a. Diffusion b. recombination c. photo voltaic action d. carrier flow

9. After firing an SCR, gating pulse is removed. The current in the SCR will

   a. remain the same
   b. immediately falls to zero
   c. rise up
   d. rise a little and then fall down

10. A TRIAC behaves like two

   a. Inverse parallel connected SCRs with common gate
   b. Diodes in series
   c. Four layer diodes in parallel
   d. Resistors and one diode.

Answer ALL Questions:-
PART B (10X2=20 Marks)

11. What is avalanche breakdown?
12. What are the two capacitive effects in a PN junction diode?
13. Draw the symbol of NPN and PNP transistor.
14. Define the operating point on a DC load line.
15. Name the two basic types of MOSFET?
16. Define drain resistance.
17. Give any two applications of LED.
18. What is an opto coupler?
19. What is brakover voltage in an SCR?
20. What is a thermistor?

Answer ALL Questions:-
PART C (5X14=70 Marks)

21.(a) (i) With a neat sketch explain the operation of a forward biased and reverse biased PN junction diode. (8)

(ii) Write short notes on the following (6)

   a. Knee voltage
   b. Dynamic resistance
   c. Reverse saturation current

(OR)

21.(b) (i) Describe in detail the transition and diffusion capacitive effects in PN junction diode. (8)

(ii) Give in detail the effect of temperature in a PN junction diode. (6)

22. (a) (i) With a neat diagram explain the input and output characteristics of a BJT in common base configuration. (14)

(OR)

22. (b) (i) Explain the various current components in a transistor with a neat diagram (8)

(ii) Derive the relation between α_{dc} and β_{dc} in a CE configuration. (6)

23. (a) (i) With a neat diagram explain the operation of JFET. (10)

(ii) What do you understand by depletion mode of MSOFET (4)

(OR)

23. (b) (i) What are the biasing schemes available to achieve the required bias in a JFET (10)

(ii) In what way FET is different from BJT (4)

24. (a) (i) Describe in detail the theory, construction and characteristics of a Photo diode. (14)

(OR)

24. (b) (i) Explain the construction and operation of LED. (10)

(ii)Write short note on solar cells. (4)

25. (a) (i) Explain with a neat sketch the concept of Avalanche and zener breakdown. (6)

(ii) Explain the working of SCR. (8)

(OR)

25.(b) (i) Describe the following in short (8)

a. sensistor.

b. piezo electric device.

(ii) Explain the operation of a varactor diode with a neat sketch and give it application. (6)