

B.E. DEGREE EXAMINATIONS: NOVEMBER 2009

Third Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07EE304: Electronic Devices

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. In a PN diode, with the increase in the magnitude of reverse bias, the reverse saturation current I_0
 - a) increases
 - b) first increases and then decreases
 - c) decreases
 - d) remains constant
2. In a forward biased PN diode, the injected hole current varies as
 - a) Q
 - b) Q^2
 - c) $1/Q$
 - d) $Q^{1.5}$where Q is the total stored charge.
3. The conductivity of the emitter region of a BJT is kept
 - a) same as that of base region
 - b) much larger than that of base region
 - c) same as that of collector region
 - d) much smaller than that of base region
4. In a BJT operating in the active region, as the magnitude of the reverse bias is increased, the effective basewidth :
 - a) remains unaltered
 - b) increases
 - c) decreases
 - d) may increase or decrease on the nature of transistor material
5. The ON-resistance $r_{d,ON}$ of an FET is the ratio :
 - a) V_{DS}/I_D at the origin
 - b) V_{DS}/I_D in the saturation region
 - c) $\Delta V_{DS}/\Delta I_D$ in the saturation region
 - d) V_{GS}/I_D at the origin
6. The transconductance g_m of a diffused junctional FET is of the order of :
 - a) 1 mS
 - b) 1 S
 - c) 100 S
 - d) 1000 S
7. In a photodiode, light is focused to fall on :
 - a) P region only
 - b) N region only
 - c) full P and N regions
 - d) junction area only
8. Photoconductive cell most popularly used for visible spectrum uses :
 - a) Ge
 - b) Si
 - c) Ga As
 - d) Cadmium sulphide
9. Thermistor is used for measurement of power at :
 - a) Audio frequencies
 - b) High frequencies
 - c) Very high frequencies
 - d) Microwave frequencies
10. Zener breakdown results at applied :
 - a) forward bias exceeding about 6 volts
 - b) forward bias less than about 6 volts
 - c) reverse bias exceeding about 6 volts
 - d) reverse bias less than about 6 volts

PART B (10 x 2 = 20 Marks)

11. What is forward and reverse biasing of a PN junction?
12. How does transition capacitance varies with junction voltage and diffusion capacitance varies with diode forward current in a P-N junction diode?
13. Why collector is made larger than emitter and base?
14. Why CE configuration is most popular in amplifier circuits?
15. Why is input impedance of the FET very high?
16. Why field effect transistors are called unipolar transistors?
17. Compare the performance of LCDs and LEDs.
18. Comment on the spectral response versus frequency curve of a photoconductive cell.
19. Describe the principle of working of varactor diode.
20. Draw the volt-ampere characteristics of zener diode.

PART C (5 x 14 = 70 Marks)

21. a) i) Describe the action of PN junction diode under forward bias and reverse bias. (10)
ii) Mention the applications of a PN junction diode (4)
(OR)
- b) Explain the following terms in a PN junction diode
 - i) Maximum forward current
 - ii) Peak Inverse Voltage
 - iii) Maximum power supply
22. a) i) Explain the input and output characteristics of a transistor in CB Configuration. (10)
ii) What are the different configurations of BJT? (4)
(OR)
- b) i) What is the relation between I_B , I_E , and I_C in CB Configuration. (7)
ii) Compare the performance of a transistor in different configurations (7)
23. a) i) Compare JFET with BJT. (7)
ii) How does the constructional feature of a MOSFET differ from that of a JFET. (7)
(OR)
- b) With the help of neat sketches and characteristics curves, explain the operation of the junction FET.

24. a) i) Compare the working principle of LED and solar cell. (8)
ii) Draw and explain a seven-segment LED display. (6)

(OR)

- b) i) Describe with neat diagrams, the theory of photo transistors. (10)
ii) State the application of an LED. (4)

25. a) i) What is LDR? Explain the use of LDR in the field of light measurements. (8)
ii) Explain briefly about Varactor diode. (6)

(OR)

- b) i) With the help of V-I characteristics show how a Zener diode is used as a voltage regulator. (8)
ii) Explain briefly about thermistors. (6)
