

ANNA UNIVERSITY COIMBATORE
B.E. / B.TECH. DEGREE EXAMINATIONS JAN / FEB 2009

REGULATIONS : 2007

SECOND SEMESTER

070290001 / 4EC1201 – ELECTRON DEVICES

(COMMON TO EEE / ECE / EIE / ICE / BIOMEDICAL / MEDICAL ELECTRONICS)

TIME : 3 Hours

Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. Define electric field intensity.
2. Why does an electron take a cycloidal path when it is exposed to perpendicular electric and magnetic fields?
3. Distinguish between intrinsic and extrinsic semiconductor.
4. Define drift current.
5. Define static and dynamic resistance of a diode.
6. What is the effect of temperature on resistance?
7. Explain the term transition capacitance C_T of a PN diode.
8. What is the function of clamper circuit?
9. Why CE configuration considered to be most versatile one?
10. Derive the relation between α and β .
11. What is early effect?
12. Compare BJT with FET.
13. Why field effect transistor is called so?
14. Define pinch off voltage.
15. Mention some applications of JFET.
16. Why are N channel MOSFETs preferred over P channel MOSFETs?
17. Compare LED and LCD.

18. What is optoisolator?
19. What is thyristor? Mention some of them.
20. Draw the two transistor version of SCR.

PART – B

(5 x 12 = 60)

ANSWER ANY FIVE QUESTIONS

21. (a) Discuss the motion of an electron under the influence of applied magnetic field. (8)
(b) What assumptions are made while analyzing the motion of an electron in an electric field. (4)
22. (a) Two parallel plates are kept 8mm apart. One plate is kept 250 V positive with respect to the other. An electron starts from rest from negative plate. Calculate the velocity, kinetic energy and distance traveled after time 0.4×10^{-19} s? (6)
(b) In a p-type semiconductor, the Fermi level lies 0.4eV above the valance band. Determine the new position of Fermi level if the concentration of acceptor atoms is multiplied by a factor of (i) 0.5 and (b) 4. Assume $KT = 0.025$ eV. (6)
23. (a) What is clipper? With the help of circuit diagram and waveform, describe the operation of positive and negative clipper. (6)
(b) With the help of circuit diagram and waveform, describe the operation of positive and negative clamper. (6)
24. (a) Compare the performance of a transistor in a different configuration. (6)

24. (b) With neat diagram, explain the operation, input and output (6)
characteristics of CC configuration.
25. (a) Derive the equations for voltage gain, current gain, input impedance and (6)
output impedance for a BJT using the approximate h parameter model
for CE configuration.
- (b) Explain the theory of operation and characteristics of UJT. (6)
26. Explain the frequency characteristics of FET. (12)
27. (a) Draw and explain the characteristics of TRIAC. (8)
- (b) Explain the application of zener diode as a voltage regulator. (4)
28. (a) Explain in detail about photovoltaic effect. (8)
- (b) Write short notes on solar cells. (4)

***** THE END *****