

Reg. No. \_\_\_\_\_

# Karunya University

(Karunya Institute of Technology and Sciences)

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

## End Semester Examination – November/December 2010

Subject Title: ELECTRON DEVICES

Time: 3 hours

Subject Code: EC201

Maximum Marks: 100

### Answer ALL questions

#### PART – A (10 x 1 = 10 MARKS)

1. Draw the energy band structure of a semiconductor.
2. Draw the V-I Characteristics of an ideal P-N diode.
3. Write the generalized transistor equation.
4. Write the relationship between  $\alpha$  and  $\beta$  in the transistor.
5. Draw the hybrid model for two-port network.
6. What is another name for common emitter amplifier?
7. Write any two PUT applications.
8. Draw the equivalent circuit of SCR.
9. Write the applications of phototransistor.
10. What are the semiconductor materials used for the fabrication of LED?

#### PART – B (5 x 3 = 15 MARKS)

11. What is mass action law?
12. Define early effect.
13. Define the h-parameters  $h_{fe}$  and  $h_{oe}$ .
14. Draw the structure of Enhancement MOSFET.
15. What do you mean by tunneling in Tunnel diode?

#### PART – C (5 x 15 = 75 MARKS)

16. Explain about the open circuited PN junction.  
(OR)
17. Explain the working principle of diode in the forward and reverse bias condition and draw its V-I characteristics.
18. Draw the Common Base configuration and explain the input and output characteristics of the same.  
(OR)
19. The CE configuration circuit has  $V_{BB}=5V, V_{CC}=10V, R_C=3k\Omega$ , and  $R_B=50k\Omega$ . If  $h_{FE}=100$ , determine whether or not the Si transistor is in saturation and  $I_B$  and  $I_C$  for two cases. i)  $R_E=0\Omega$ , ii)  $R_E=2k\Omega$ .
20. Obtain voltage gain, current gain, input impedance and output admittance of a transistor amplifier circuit using h-parameters.  
(OR)
21. In the CE amplifier if  $R_L=10k\Omega$  and  $R_s=1k\Omega$ , find the various gains, input and output impedances. Assume  $h_{fe}=50, h_{oe}=25\mu A/V$ .
22. Explain the working of an N channel FET and draw its drain and transfer characteristics.  
(OR)
23. Explain the working principle of PUT.
24. Explain the working principle of Zener Diode.  
(OR)
25. Discuss the operation of Tunnel diode.