

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

# Karunya University

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

## End Semester Examination – November / December 2008

Subject Title: ELECTRON DEVICES

Time : 3 hours

Subject Code: EC201

Maximum Marks: 100

### Answer ALL questions

#### PART – A (10 x 1 = 10 MARKS)

1. How do you increase the conductivity of intrinsic semiconductor?
2. What are the charge carriers found in P type semiconductor?
3. Define emitter efficiency.
4. In common base configuration with active region, the collector junction is biased in the \_\_\_\_\_ direction and the emitter junction in the \_\_\_\_\_ direction.
5. Emitter follower has \_\_\_\_\_ transistor amplifier configuration.
6. Which transistor amplifier configuration has lowest current gain?
7. Which type MOSFET is called normally off MOSFET?
8. Draw the schematic symbol of SCR.
9. What are tunnel diodes?
10. Draw the symbol of varactor diode.

#### PART – B (5 x 3 = 15 MARKS)

11. What is avalanche breakdown?
12. Write the Eber's Moll equation for emitter and collector currents.
13. Define the various h parameters of bipolar junction transistor.
14. The intrinsic stand off ratio of UJT is 0.65. If the inter base resistance is 7.5 Kohms. Determine  $R_1$  and  $R_2$ .
15. Write short notes on opto coupler and mention its advantages.

#### PART – C (5 x 15 = 75 MARKS)

16. a. Show that in an intrinsic semiconductor the Fermi level lies midway between the conduction and valance band. (7)  
b. Find the conductivity and resistivity of an intrinsic semiconductor at room temperature. It is given that (8)  
 $n_i = 2.5 \times 10^{13} \text{ cm}^{-3}$  ;  $\mu_n = 3800 \text{ cm}^2 / \text{sV}$   
 $\mu_p = 1800 \text{ cm}^2 / \text{sV}$  ;  $e = 1.6 \times 10^{-19} \text{ C}$   
(OR)
17. Derive the condition of dynamic equilibrium for the density of charge carriers for the continuity equation. Also explain the three special cases of continuity equation.
18. Draw and explain the static characteristics of a Common Base transistor configuration. (OR)
19. Explain the basic structure of different bipolar transistor and the various transistor current components.

[P.T.O]

20. a. Explain the small signal low frequency T equivalent circuit of a common base configuration. (10)
- b. Compare CE, CB and CC transistor configuration. (5)
- (OR)
21. Draw the hybrid – Pi model common emitter transistor and derive the values of the various components in terms of h – parameters.
22. a. With neat diagram, explain the operation, V-I and transfer characteristics of N- channel depletion type MOSFET. (10)
- b. Compare depletion and enhancement type of MOSFET. (5)
- (OR)
23. Explain the construction, working and applications of a UJT with neat sketches.
- 24 a. What is zener effect? Explain the functions of a zener diode and its characteristics. Mention its applications. (10)
- b. Mention the applications of DIAC and TRIAC. (5)
- (OR)
25. Describe the construction, working and application of the following devices. (8+7)
- a. Photo Diode      b. Light Emitting Diode