Reg. No. _____

Karunya University

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

End Semester Examination – November / December 2009

Subject Title: ELECTRON DEVICES **Time : 3 hours**
Subject Code: EC201 **Maximum Marks: 100**

Answer ALL questions
PART – A (10 x 1 = 10 MARKS)

1. Electrons have more mobility than holes. Why?
2. The depletion layer of a PN junction _____ when reverse biased.
3. Define transport factor.
4. What is the condition for thermal stability?
5. Why h parameters are called hybrid?
6. Which amplifier configuration has highest current gain and lowest power gain?
7. A JFET is a _____controlled device.
8. The UJT has R_{BB} = 10Kohms and R_{B1}= 4Kohms. What is the intrinsic standoff ratio?
9. Which diode is used for voltage regulation?
10. The color of light emitted by an LED depends on _____.

PART – B (5 x 3 = 15 MARKS)

11. Define Hall Effect. What are its applications?
12. What is large signal current gain of transistor? State its significance.
13. Define h_{ie} and h_{fe} of a CE transistor amplifier.
14. Mention the applications of FETs.
15. Draw the two transistor analogy of SCR.

PART – C (5 x 15 = 75 MARKS)

16. a. Describe the energy band structure of an insulator, a metal and a semiconductor. (9)
    b. Write in detail about the diffusion capacitance of a diode. (6)

(OR)

17. a. Draw and explain the forward and reverse bias characteristics of a PN junction diode. (10)
    b. At room temperature, copper has free electron density of 8.4 x 10^{28} per m^3. Find electron drift velocity in the copper conductor having a cross section of $10^{-6}m^2$ and carrying a current of 5.4 A. Assume e = 1.6 x 10^{-19} C. (5)

18. a. Explain the various current components in a transistor under proper biasing conditions.(10)
    b. Draw the Eber's Moll model for a PNP transistor and derive the current equation. (5)

(OR)

19. Draw and explain the static characteristics of transistor under common emitter configuration with neat sketches.

20. Draw and explain the T equivalent model for CB, CE and CC configurations.

(OR)

21. Draw and explain the operation of a common collector amplifier with neat circuit. Draw the ac equivalent circuit.

[P.T.O]

22. Explain the construction and operation of a JFET with neat diagrams in detail.

(OR)

23. Explain the construction, operation and the characteristics of SCR with neat sketches.

24. Explain the construction, operation and the characteristics of a TRIAC. Mention its applications.

(OR)

25. Explain the operation and the characteristics of the following:
    a. Photo diode (7)
    b. Varactor diode (8)