

**B.E DEGREE EXAMINATIONS: MAY/JUNE 2014**

(Regulation 2013)

Second Semester

**ELECTRONICS AND INSTRUMENTATION ENGINEERING**

U13EIT201: Electron Devices

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The temperature dependence of reverse saturation current for Ge diode is given by.....
  - a)  $I_0 = K_1 T^2 \exp(-V_{G0}/V_T)$
  - b)  $I_0 = K_1 T^2 \exp(-2V_{G0}/V_T)$
  - c)  $I_0 = K_2 \exp(-V_{G0}/V_T)$
  - d)  $I_0 = K_2 T^{3/2} \exp(-V_{G0}/2V_T)$
2. The pentavalent impurities added to intrinsic semiconductors are called.....
3. The value of  $\alpha$  for an NPN transistor operating in the active region with a collector current of 7mA & emitter current of 7.2mA is
  - a) 0.97 mA
  - b) 97mA
  - c) 15.4mA
  - d) 1.02mA
4. In a properly biased NPN transistor, most of the electrons from the emitter.....
5. Thermal runaway is not possible in FET because as the temperature of the FET increases:
  - a) the mobility decreases
  - b) the transconductance increases
  - c) the drain current increases
  - d) the mobility increases
6. In enhancement type MOSFET, the drain current equation is given by.....
7. The operating voltage range of LED is.....
  - a) 1.5 to 2.5V
  - b) 5 to 10V
  - c) above 10 V
  - d) less than 1 V
8. Photo diode can be used as a.....device.
9. The ability of SCR to remain conducting, even when the gate signal is removed is known as.....
  - a) Latching
  - b) triggering
  - c) rate-effect
  - d) interruption
10. The minimum anode- cathode voltage required to turn on SCR is called as.....

**PART B (10 x 2 = 20 Marks)**

**(Not more than 40 words)**

11. Show the energy band structure of n- type semiconductor.
12. What is mobility? What is its unit?
13. Why CE configuration is mostly preferred than the other configurations?
14. What is base spreading resistance?
15. How depletion region is formed in JFET?
16. Classify N-channel and P-channel JFET.
17. What is a solar cell?
18. Why a photodiode is used in reverse biased condition?
19. Define Tunneling phenomenon.
20. Name some applications of TRIAC.

**PART C (5 x 14 = 70 Marks)**

**(Not more than 400 words)**

**Q.No. 21 is Compulsory**

21. (i) Show the switching characteristics of a diode. (10)  
(ii) Define the term diffusion capacitance and derive the relation for the same. (4)
22. a) Distinguish CE, CB& CC configurations of BJT.  

**(OR)**

  - b) (i) Show the hybrid model for CE Configuration. (4)  
(ii) Demonstrate the switching characteristics of a transistor. (10)
23. a) Show the operation & characteristics of N-channel JFET with neat diagrams. And also mention its two important parameters.

**(OR)**

- b) Recall the operation & characteristics of UJT with neat diagrams.

24. a) (i) Extend the construction & operation of LED. (7)  
(ii) Compare LED & PN diode. (7)

**(OR)**

- b) Explain the construction, operation, volt ampere characteristics, and application of Photo diode

25. a) Summarize the construction, operation, equivalent circuit, volt ampere characteristics and application of TRIAC.

**(OR)**

- b) Write short notes on:  
i) CCD (5)  
ii) Varactor Diode (5)  
iii) LDR (4)

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