KUMARAGURU
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Register Number: …………

B.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2013)

Second Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U13ECT202**:** Electron Devices

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In a properly biased NPN transistor, most of the electrons from the emitter ___________.
   a) recombine with holes in the base
   b) recombine in the emitter itself
   c) pass through the base to the collector
   d) are stopped by the junction barrier
2. Diffusion occurs in _________ semiconductors.
3. In JFET, if the reverse voltage is 10V and the gate current is $0.1\mu A$ then the input resistance is____________
   a) 100MΩ
   b) 100KΩ
   c) 10KΩ
   d) 10MΩ
4. The path of an electron in a uniform magnetic field is ____________ .
5. A tunnel diode is ___________.
   a) slow switching device
   b) a very heavily doped PN diode
   c) a high resistivity PN diode
   d) always used with reverse bias
6. The speed of an electron after it has moved through a potential difference of 5000V is____________

7. The following is one of the material used to manufacture LED.

a) GaAs	b) Si
c) Ge	d) B

8. When applied reverse voltage of PN diode increases, the depletion layer width ____________ .

9. During the manufacture of monolithic IC's , the electrical isolation technique not used is ___________.

a) Dielectric	b) Beam LED
c) PN junction	d) Capillarization

10. The process that is used to produce thin metal film layer which serves to make interconnection of various components is ___________ .

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. Calculate the maximum velocity of the beam of electrons in a CRT having anode voltage of 800 V. Charge of electrons is 1.6 x 10^{-19}C and mass of the electrons is 9.1x10^{-31} kg.
12. Compare the electrostatic and magnetic deflection systems**.**
13. Define drift and diffusion current?
14. How does the zener breakdown voltage vary with temperature?
15. Define: rise time, fall time, storage time & delay time with respect to BJT.
16. What is the effect of gate-to-source voltage on Drain characteristics?
17. What is tunneling phenomenon?
18. Why a photodiode is used in reverse biased condition?
19. Describe the various packaging configurations of a chip.
20. Why do we use aluminium for metallization?

PART C (5 x 14 = 70 Marks)
(Not more than 400 words)

Q.No. 21 is Compulsory

21. a) i) Analyze the motion of an electron in a magnetic field & derive equations for radius, time period & angular velocity. (8)

ii) An electrically deflected CRT has a final anode voltage of 2000V and parallel deflecting plates 1.5 cm long and 5mm apart. If the screen is 50cm from the centre of the deflecting plates, find (6)

i) The beam speed ii) The deflection sensitivity of tube iii) Deflection factor of tube**.**

22. a) Derive the continuity equation from the first principle and also derive three special cases of continuity equation.

(OR)

b) i) Draw the band structure of open circuited PN diode and also derive the expression for contact potential V_o. (7)

ii) Obtain the expression for diffusion capacitance. (7)

23. a) i) Explain the input and output characteristics of a transistor in CE configuration. (10)

ii) Explain the current components of a BJT. (4)

(OR)

b) Explain the operation & characteristics of depletion type MOSFET with neat diagrams.

24. a) i) Explain the construction, operation, equivalent circuit, volt ampere characteristics and application of UJT. (10)

ii) Compare LED & PN diode. (4)

(OR)

b) Explain the construction, operation, equivalent circuit, volt ampere characteristics, and application of TRIAC.

25. a) Explain the processes involved in the fabrication of monolithic IC

(OR)

b) Explain how a MOSFET is formed in IC fabrication.

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