Register Number.....

B.E. DEGREE EXAMINATIONS: APRIL /MAY 2009

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U07EI305 Electronic Devices

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

Answer ALL the Questions:-

PART A (20 × 1 = 20 Marks)

1. The p n junction diode voltage current relationship is given by the equation

   A $I = I_o(e^{V/\eta V_T} - 1)$ B. $I_o = I\,(e^{V/\eta V_T} - 1)$ C. $I = I_o(e^{V_T/\eta V} - 1)$ D. $I_o = I\,(e^{V/\eta V_T} - 1)$

2. The forward voltage drop of a germanium diode is

   A. 0.35 V B. 0.4 V C. 0.3 V D.0.6 V

3. The forward current in a circuit consisting of a germanium diode connected in series with a 9V battery and a 3.3 kΩ resistor is

   A. 2.73mA B. 2.63mA C. 2.51mA D. 2.81mA

4. When the temperature increases the maximum power dissipation of the device

   A. Increases B. Decreases C. Remains constant. D. Drops to zero

5. The base of a BJT is

   A. Heavily doped B. Moderately doped.

   C. lightly doped D. either moderately or lightly doped

6. The base spreading resistance in a transistor is basically the

   A. DC ohmic base resistance. B. Emitter to base resistance.

   C. Emitter resistance D. Collector resistance

7. The interval which elapses between the transition of input waveform and the time when I_C has dropped to 90 percent of I_{CS} is called

   A. Dead time B. Rise time. C. Delay time D. Storage time

8. In a common emitter configuration the current gain and voltage gain are

   A. Equal B. Greater than unity. C. Less than unity. D. equal to1

9. The I_{DSS} is the value of drain current at

   A. $V_D = 0$ V B. $V_G = 0$V C. $V_D = 1$V D. $V_G = 1$V

10. In a n - channel JFET the application of negative gate bias causes

    A. widening of depletion region. B. narrowing of depletion region.

    C .increase in gate size D. Decrease in gate size

11. VVR is the other name given for

A. UJT B. BJT C. JFET D.pn diode

12. In MOSFETs the channel for the flow of majority carriers is

A. Real. B. Virtual C. formed by minority carriers D. Very wide

13. Light energy is measured in _____ units

A. milli watts. B. lumens C. either milli watts or lumens D. Candelas

14. A gallium arsenide phosphide material used as a LED emits

A. red light B. green light C. blue light D. orange light

15. A solar cell is essentially a large _____

A. photodiode B. laser diode.

C. photoconductive cell D. light emitting diode

16. The purpose of opto isolators is to provide

A. electrical isolation B. mechanical isolation.

C. couple two devices D. isolate two devices.

17. The _____ is a bi directional device

A. TRIAC B.SCR C. tunnel diode D. pn diode

18. The _____ is used in high speed switching

A. tunnel diode B. FET C. BJT D. zener diode

19. _____ finds application in regulators

A. laser diode B. tunnel diode C. photodiode D. zener diode

20. In a varactor diode the depletion layer capacitance depends on

A. junction area B. doping level

C. depletion region width. D. both junction area and depletion region width

PART B (5 x 16 = 80 Marks)

21. (a) Explain the origins of depletion layer capacitance and diffusion capacitance and discuss the importance of each.

(OR)

21. (b) (i) Sketch the equivalent circuits for forward and reverse biased diodes (6)

(ii) With neat sketch explain the diode switching time (10)

22. (a) (i) Determine α_{dc} and I_B that has I_C = 2.5 mA and I_E = 2.55 mA, also calculate β_{dc} for the transistor (6)

(ii) Explain transistor common emitter configuration and list reasons why it is preferred most (10)

(OR)

(b) With neat sketch explain the operation of a BJT

23. (a) Draw the symbol, construction and explain the working of a n channel JFET.

(OR)

23. (b) Draw the symbol , construction , equivalent circuit of UJT and explain its operation

24. (a) With an example circuit explain how an opto coupler is used to pass a linear signal between two circuits with different supply voltages.

(OR)

24. (b) Explain the construction and characteristics of light emitting diodes

25. (a) Discuss about the differences between ordinary pn diode and zener diode. Explain the concept of avalanche breakdown.

(OR)

25. (b) Sketch the resistance /temperature characteristics of a thermistor and discuss its operation.

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