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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Third Semester

Electrical and Electronics Engineering

EC 1211 — ELECTRONIC DEVICES

(Regulation 2004)

(Also common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering branches of Annual Pattern candidates admitted in 2006)

(Common to B.E. (Part-Time) Second Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the VI characteristics of a PN junction diode.
2. A Ge diode has a saturation current of $10\ \mu\text{A}$ at 300°K . Find the saturation current at 400°K .
3. For a npn transistor $I_E = 12\ \text{mA}$ and $\beta = 140$. Determine the value of I_B and I_C .
4. A transistor connected in common base configuration has a _____ input resistance and a _____ output resistance.
5. Differentiate FET and BJT (any two).
6. List the JFET parameters.
7. Define fill factor.
8. Distinguish between photo diode and LED.
9. Realize a SCR using two transistors.
10. Draw the equivalent circuit of a varactor diode.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat diagram explain the working of a PN junction diode in forward bias and in reverse bias.

Or

- (b) (i) Explain the switching characteristics of PN junction diode. (10)
(ii) Discuss the effect of doping on depletion region. (6)
12. (a) The hybrid parameters for a transistor used in CE configuration are $h_{ie} = 1000 \Omega$; $h_{fe} = 150$; $h_{re} = 1.2 \times 10^{-4}$; $h_{oe} = 25 \times 10^{-6}$ ohms. The transistor has a load resistance of $10 \text{ K}\Omega$ in the collector and is supplied from a signal source of resistance $5 \text{ K}\Omega$. Compute the values of input impedance, output impedance, current gain and voltage gain.

Or

- (b) (i) From the CE configuration output characteristics, explain the three region of operation of a transistor. (10)
(ii) How could transistor act as a switch. (6)
13. (a) (i) Compare JFET and MOSFET. (any five) (5)
(ii) Give a detailed description of construction and operation of JFET. (11)

Or

- (b) (i) Explain the operation of UJT hence draw its VI characteristics. (10)
(ii) Draw the equivalent circuit of UJT and define the intrinsic stand off ratio. (6)
14. (a) (i) Describe the operation of a photo transistor. (6)
(ii) Discuss the two methods and two modes of LCD that are used to control properties of light. (10)

Or

- (b) Brief the following :
- (i) Opto couplers (8)
(ii) Solar cell. (8)

15. (a) (i) Give an account for charge coupled devices. (6)
- (ii) Narrate the operation of zener diode and define Zener breakdown. Draw its VI characteristics. (10)

Or

- (b) (i) Differentiate SCR and TRIAC. (6)
- (ii) With the energy band diagram explain the VI characteristics of Tunnel diode. (10)
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