Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71722

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Second Semester

Electronics and Communication Engineering

EC 6201 — ELECTRONIC DEVICES

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Find the voltage at which the reverse current in a germanium PN junction diode attains a value of 90% of its saturation value at room temperature.
2. What is meant by peak inverse voltage?
3. Define early effect.
4. If a transistor has a α of 0.97, find the value of β.
5. Compare FET and BJT.
6. Give the current voltage relationship of the D- MOSFET and E-MOSFET.
7. Mention few applications of varactor diode.
8. Define Gunn effect.
9. Draw the basic structure of DIAC and its symbol.
10. Define holding current.

PART B — (5 × 16 = 80 marks)

11. (a) Derive an expression for PN junction diode forward and reverse currents with suitable diagram and necessary explanation. (16)

Or

(b) Discuss about the switching characteristics of PN junction diode with suitable diagrams. (16)

12. (a) (i) Draw the Eber's Moll model for a PNP transistor and explain its significance. (8)

(ii) What is known as current amplification factor? Derive the relationship between the amplification factor of CE, CB and CC configuration. (8)

Or

(b) (i) A transistor with $I_B = 100\mu A$, and $I_C = 2\ mA$ find

(1) β of the transistor

(2) α of the transistor

(3) emitter current I_E

(4) if I_B changes by $25\mu A$ and I_C changes by 0.6 mA. Find the new value of β. (10)

(ii) Justify transistor as an amplifier. (6)

13. (a) (i) What is known as metal oxide semiconductor field effect transistor? Explain its principles of operation in enhancement mode with suitable diagram. (10)

(ii) Discuss the effect of channel length modulation. (6)

Or

(b) Explain the construction and operation of N-Channel JFET with suitable diagram. (16)

14. (a) Draw the V-I characteristics of zener diode and explain its operation and also brief how it can be used as a regulator. (16)

Or

(b) Draw the V-I characteristics of Schottky diode and explain its operation. (16)

15. (a) Draw the transistor model of an SCR and describe the working principle of an SCR with V-I characteristics. (16)

Or

(b) Write short notes on :

(i) Opto coupler. (8)

(ii) LCD. (8)
