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Question Paper Code : X 20437

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Second Semester

Electronics and Communication Engineering

EC 6201 – ELECTRONIC DEVICES

(Regulations 2013)

(Common to PTEC 6201 for B.E. (Part-Time) Electronic Devices – First Semester
Regulations – 2014)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is recovery time ? Give its types.
2. State Hall Effect.
3. Define Early Effect.
4. What do you mean by multi emitter transistor ?
5. What is channel length modulation ?
6. Differentiate JFET and BJT.
7. Why zener diode is often preferred than PN diode ?
8. What is a Tunnel Diode ?
9. Why SCR cannot be used as a bidirectional switch ?
10. Mention the applications of UJT.

PART – B

(5×16=80 Marks)

11. a) Derive the quantitative theory of PN diode currents. (16)

(OR)

- b) i) Draw a diagram to illustrate drift current and diffusion current in a semiconductor material. Explain in detail. (10)
- ii) Elucidate the switching characteristics of diode. (6)



12. a) i) Derive the expression of Gummel Poon model with a neat circuit diagram. (8)
ii) Explain NPN transistor common emitter configuration and draw a circuit for determining its input and output characteristics. (8)

(OR)

- b) i) Draw the Eber's Moll model for a PNP transistor and explain its significance. (8)
ii) A transistor with $I_b = 100 \mu\text{A}$ and $I_c = 2 \text{ mA}$. Find
a) β of the transistor
b) α of the transistor
c) emitter current I_E
d) If I_b changes by $25 \mu\text{A}$ and I_c changes by 0.6 mA , find the new value of β . (8)

13. a) i) With a neat diagram, explain the construction, working principle and V-I characteristics of N channel JFET. (10)
ii) Calculate the operating point of the self biased JFET having the supply voltage $V_{DD} = 20 \text{ V}$, maximum value of drain current $I_{DSS} = 10 \text{ mA}$ and $V_{GS} = -3 \text{ V}$ at $I_D = 4 \text{ mA}$. Also determine the values of resistors R_D and R_S to obtain this bias condition. (6)

(OR)

- b) i) With the help of a suitable diagram, explain the working of E-MOSFET. (8)
ii) Write a detailed notes on FINFET. (8)

14. a) i) Explain the principle behind LASER diode with a neat sketch. (8)
ii) Draw the V-I characteristics of Zener Diode and explain its operation. (8)

(OR)

- b) i) Describe the VI characteristics of LDR. (8)
ii) Examine the effectiveness of varactor diode with its applications. (8)

15. a) i) Explain DMOS and VMOS of a transistor with its operations. (8)
ii) Write short notes on :
a) Solar cell (4)
b) Optocoupler. (4)

(OR)

- b) Critically examine the operation, characteristics and applications of SCR. (16)
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