Q. Code: 659346

Reg. No.

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2023
Second Semester
EC18201 – ELECTRON DEVICES
(Electronics and Communication Engineering)
(Regulation 2018)

TIME: 3 HOURS   MAX. MARKS: 100

CO 1 Depicted the construction, working principle and V – I (Voltage and Current) characteristics of PN Junction diode.

CO 2 Explore and analyze the construction, working principle, Input and Output characteristics of BJT (Bipolar Junction Transistor).

CO 3 Expose construction, working principle, drain and transfer characteristics of FET, MOSFET and cutting edge technology of FINFET, Dual Gate MOSFET.

CO 4 Express Incredible performance of the special semiconductor devices.

CO 5 Illustrate the construction, working principle, characteristics and applications of power and display device.

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

		CO	RBT LEVEL
1.	Distinguish between Intrinsic and Extrinsic semiconductor.	1	1
2.	Define Barrier potential.	1	1
3.	List the advantages and disadvantages of Ebers Moll Model.	2	1
4.	Draw the equivalent circuit of Gummen Pool Model.	2	2
5.	What is channel length modulation?	3	1
6.	Mention the applications of EMOSFET.	3	1
7.	What is Zener Breakdown?	4	1
8.	What is tunneling phenomenon?	4	1
9.	Draw the V-I Characteristics of DIAC.	5	2
10.	What is photo voltaic effect?	5	1

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Derive the PN junction diode current equations under various biasing conditions.	14	1	3

(OR)

1

(b) With suitable diagrams, analyze the working of PN Junction diode under zero bias, forward bias and reverse bias conditions.   14   1   3

12. (a) Draw the H-parameter model of a transistor and briefly explain how the transistor is converted into H parameter equivalent.   14   2   4

(OR)

(b) Explain NPN transistor common-emitter configuration and draw the circuit for determining its input and output characteristics.   14   2   4

13. (a) Explain the working principle of P-channel JFET and draw a circuit diagram for obtaining the drain and transfer characteristics for a P-channel JFET.   14   3   3

(OR)

(b) **(i)** With neat diagram, explain the operation of MOSFET in enhancement mode.   8   3   3

      (ii) Derive the current equation for MOSFET in enhancement mode.   6   3   3

14. (a) Explain the operation and V-I characteristics of Zener diode and how it is used as a voltage regulator.   14   4   3

(OR)

(b) With neat diagram, give the working principle of LASER diode.   14   4   3

15. (a) Explain the construction, operation and characteristics of SCR.   14   5   3

(OR)

(b) **(i)** Explain the operation of Photo transistor.   8   5   3

      (ii) With a neat diagram, explain the operation of Solar cell.   6   5   3

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL

16. A transistor has $I_b = 150\mu A$ and $I_c = 2mA$. Find (a) β of the transitor, (b) α of the transistor, (c) emitter current I_e, (d) if I_b changes by $+34\mu A$ and I_c changes by $+0.6$ mA, find the new value of β.   10   2   5

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