Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

Program: B.Tech. (ECE)

Semester: 3 MORNING

Name of Subject: Electronic Devices 09 MAY 2023

Subject Code: PCEC-101

Paper ID: 16031

Scientific calculator is Allowed.

Detail of allowed codes/charts/tables etc. Not Required.

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory.
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1:

a) Compare n-type and p-type semiconductors.

b) Define stability factor of transistors.

c) Draw the current-voltage characteristics of Tunnel diode.

d) Explain h-parameters of a Common Base Transistor configuration and also, mention their units.

e) If a transistor has α=0.95, determine value of β.

f) The intrinsic carrier concentration of Silicon is $1.5 \times 10^{10} cm^{-3}$ at 300K. If after doping, the electron concentration is 10^{15} cm^{-3}, determine the hole concentration.

Part – B **[Marks: 04 each]**

Q2: Explain the working of Zener diode as a voltage regulator.

Q3: Illustrate the process of career generation and recombination in semiconductors.

Q4: Explain fixed bias stabilization technique for transistors.

Q5: Examine the role of amplification factor, transconductance and drain resistance in FET performance.

Q6: Determine V_{CE} and I_C in the voltage-divider bias transistor circuit. Assume β = 100 and $I_E \approx I_C$. R_1 = 10 kΩ, R_2 = 5.6 kΩ, R_C = 1 kΩ, R_E = 560Ω, V_{CC} =10V.

P.T.O.

Q7: A JFET has given parameters: I_{DSS} = 32 mA, $V_{GS\,(off)}$ = -8V, V_{GS} = -4.5V. Determine the value of drain current.

Part – C **[Marks: 12 each]**

Q8: Solve for the efficiency of half wave rectifier and full wave rectifier in ideal case.

OR

Explain the input and output characteristics of NPN Transistor in Common Emitter Configuration.

Q9: Distinguish between JFETs and MOSFETs. Also, explain drain characteristics, transfer characteristics and applications of MOSFETs.

OR

Discuss Hybrid-Pi Common Emitter Transistor Model with neat diagram and explanation of associated parameters.

****