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

MORNING

24 JUN 2023

[Total No. of Questions: 09] [Total No. of Pages: 2]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 3
Name of Subject: Electronic Devices
Subject Code: PCEC-101
Paper ID: 16031
Scientific calculator is Allowed

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) Define diffusion.

b) Justify, the need of operating point.

c) Define pinch off voltage for FET.

d) Write the significance of alpha cut off frequency.

e) Compare LED and LCD.

f) Distinguish enhancement and depletion MOSFET.

Part – B **[Marks: 04 each]**

Q2. Discuss various energy bands in a semiconductor.

Q3. Describe theory of PN junction diode.

Q4. Explain the operation and characteristics of Unijunction Transistor (UJT).

Q5. Derive an expression for efficiency of half-wave rectifier.

Q6. Illustrate h-parameter equivalent circuit of transistor to discuss meaning of h-parameters.

Q7. Compare intrinsic and extrinsic silicon.

Part – C **[Marks: 12 each]**

Q8. Explain construction and working of NPN transistor. Also discuss input and output characteristics of NPN transistor in common emitter configuration.

OR

Discuss the following:

(a) Tunnel diode

(b) Generation and recombination of carriers in a semiconductor

Q9. (a) Create and explain drain characteristics curve of JFET.

(b) An N-channel JFET has I_{DSS}=10 mA and V_P = -4V. Determine the minimum value of V_{DS} for pinch-off region and drain current I_D for V_{GS} = -2V in pinch-off region.

OR

Derive an expression for input impedance, output impedance, voltage gain and current gain using analysis of Common base transistor amplifier using h-parameters.

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