

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-II COMPUTER SCIENCE & BUSINESS SYSTEM : WINTER : 2024
SUBJECT: PRINCIPLES OF ELECTRONICS ENGINEERING

Day : Tuesday
Date : 26/11/2024

W-27710-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

- 1) Figures to the right indicate full marks.
- 2) Use of non-programmable calculator is allowed.
- 3) Assume suitable data if necessary.

Q. 1 Draw and explain P-type and N-type extrinsic semiconductors in detail with diagram. Also define majority and minority carries in both types of extrinsic semiconductors. (10)

OR

Q. 1 Describe the drift current and diffusion current with the help of diagram in detail. (10)

Q. 2 A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant as 20Ω . The transformer r.m.s secondary voltage from centre tap to each end of secondary is 50 V and load resistance is 980Ω
Find : i) the mean load current
ii) the r.m.s value of load current. (10)

OR

Q. 2 Draw and explain the V-I characteristics of a P-N junction. What is mean by zener breakdown and avalanche breakdown in diodes? (10)

Q. 3 Write short notes on the following: i) advantages of transistors (10)
ii) operating point iii) d.c. load line

OR

Q. 3 Explain in detail the input and output characteristics of common emitter connection. (10)

Q. 4 Write short notes on the following: (10)
i) advantages of JFET ii) difference between MOSFET and JFET

OR

Q. 4 Explain the transfer characteristic of D-MOSFET for a certain D-MOSFET, $IDSS=10\text{ mA}$ and $VGS\text{ (off)}=-8\text{ V}$
i) Is this an n-channel or a p-channel? ii) calculate ID at $VGS = -3\text{ V}$ iii) calculate ID at $VGS = +3\text{ V}$ (10)

Q. 5 Explain the operation of Op-Amp as adder and subtractor in detail. (10)

OR

Q. 5 Explain the inverting and non-inverting mode of operation. write a short note on voltage follower in Op-Amp (10)

Q. 6 Explain in detail the following flip-flops with their truth table. (10)
i) S-R flip flop ii) D flip flop iii) J-K flip flop iv) T flip flop

OR

Q. 6 Define counter. State the types of counters. Draw and explain the operation of 4-bit Ring counter using D-flip flop with timing diagram. (10)

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