STATE BOARD OF TECHNICAL EDUCATION AND TRAINING
TELANGANA
DIPLOMA EXAMINATION (C-18)
C-18-REGULAR-AUGUST-2021
SEMESTER II , SEMESTER END EXAM
18EC/BM/ES/EV

6239

205C
SEMICONDUCTOR DEVICES

Duration: 3 Hours [Total Marks: 60]

PART-A

Instructions: 1. Answer any **TWELVE** questions. 12 X 1 = 12
2. Each question carries **ONE** mark.

1. Mention the types of semiconductors.
2. List the majority charge carriers and minority charge carries in N type material .
3. Define Gamma.
4. Give the relation between β and α.
5. Define thermal run away.
6. Define stabilization in amplifier circuits.
7. What is the relation between amplification factor,Drain resistance and transconductane of a JFET?
8. List any two specifications of JFET.
9. Define voltage regulation .
10. Draw the circuit of CLC filter.
11. List any Two transistors used for low power audio applications.
12. Give the expression for current gain β of Transistor in terms of voltage gain.
13. Write the collector current expression in CE mode of transistor.
14. List types of transistor biasing circuits.
15. Draw the Input and output waveforms of rectifier with RC filter.

PART-B

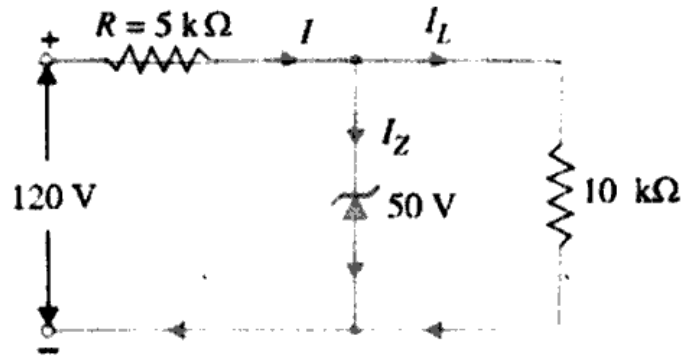
Instructions: 1. Answer any **SIX** questions. 6 X 3 = 18
2. Each question carries **THREE** marks.

16. List any three differences between Zener breakdown and Avalanche breakdown.
17. Obtain the Total collector current equation in CB configuration.
18. List the factors affecting the Q-point.
19. Draw the mutual characteristics of JFET.
20. Draw the circuit diagram of bridge rectifier using C filter with input and output waveforms.
21. Give Pin configuration of Voltage Regulator ICs 7805 and 7912 and their regulated output values.
22. Draw the circuit for transistor in Common Collector configuration.
23. Draw the circuit diagram of CMOS inverter.
24. Calculate emitter current I_E of BJT, with β=50 and collector current I_C of 20mA.

PART-C

Instructions: 1. Answer any **SIX** questions. 6 X 5 = 30
2. Each question carries **FIVE** marks.

25. Explain the formation of PN junction diode.
26. Explain the working of transistor as an amplifier.
27. Explain the self bias circuit and derive its stability factor .
28. Explain the construction and principle of operation of enhancement type n-channel MOSFET.
29. For the circuit shown in Fig. find : (i) the output voltage (ii) the voltage drop across series resistance (iii) the current through zener diode.



30. Explain the use of a PN junction diode for protection against polarity reversal.

31. Explain about the formation of P type and N type semiconductor materials.

32. Draw and explain the drain characteristics of JFET.

33. Explain the working of half wave rectifier circuit with waveforms.