

QP CODE: 25050672



Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION, DECEMBER 2025

First Semester

M Sc ELECTRONICS

Core Courses - EL010102 - ELECTRONICS CIRCUITS AND ANALYSIS

2019 Admission Onwards

DC4AF7D2

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Mention the applications of depletion type MOSFETs.
2. What is threshold voltage in a MOSFET. Give its importance.
3. What is the need for a model for a BJT? Which model is the best suited for BJT?
4. What are the applications of Darlington connection?
5. Draw and give the design of an integrator circuit.
6. What are the applications of Schmitt trigger?
7. What are the modes of operation of thyristor?
8. Mention the merits and demerits of self commutation.
9. Sketch output voltage and output current waveform of type-C chopper.
10. What is AC voltage controller? List few applications of AC voltage controller.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. How a Zener diode can be configured as a voltage regulator?
12. How transfer characteristics can be found out from Schockley's equation?
13. Find the values of Z_i , Z_o , A_v for a JFET voltage divider configuration with $R_1=82 \text{ M Ohm}$, $R_2=11 \text{ M Ohm}$, $R_D=2 \text{ K Ohm}$, $R_s=610 \text{ Ohm}$. Take $V_i=20 \text{ mV}$, $I_{DSS}=12 \text{ mA}$, $V_p=-3 \text{ V}$, $r_d=100 \text{ K Ohm}$.





14. Explain the circuit and applications of a Darlington connection amplifier.
15. Define a) CMRR b) Slew Rate. Discuss their significances.
16. Derive the voltage gain of a non-inverting amplifier. Discuss the practical applications of non-inverting amplifier.
17. A UJT relaxation oscillator is fabricated to generate pulses for triggering SCRs. When the circuit is energised, the circuit fails to oscillate. What could be the possible causes of this failure? How the circuit be made functional?
18. For a single phase bridge inverter with RL load derive expressions for steady state current for first 2 half cycles of the output voltage.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss the various configurations of BJT. Compare and explain the applications of each configuration.
20. With reference to JFET small signal model derive input resistance, output resistance and voltage gain for a fixed bias configuration.
21. Discuss the advantages of active filters. Explain how a filter can be designed.
22. With the help of circuit diagram describe the operation of single phase full wave bridge converter with RL load. Draw the waveforms. Derive expressions for rms and average output voltages.

(2×5=10 weightage)

