



23003150

QP CODE: 23003150

Reg No :

Name :

M Sc DEGREE (CSS) EXAMINATION, APRIL 2023

First Semester

M Sc PHYSICS

CORE - PH010104 - ELECTRONICS

2019 ADMISSION ONWARDS

F2C4CF2E

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain the function of a differential amplifier with circuit diagram. Why they are better than single input system?
2. Explain the total output offset voltage in the inverting amplifier with feedback.
3. What are the difference between input offset voltage and input offset current?
4. What is a peaking amplifier?
5. Explain the difference between slew rate and transient response.
6. Define filter. How filters are classified?
7. Draw the circuit diagram of triangular wave generator using a comparator and integrator. Obtain the output waveforms
8. What is the difference between a basic comparator and the Schmitt trigger?
9. Why modulation is needed for analog communication?
10. What is AGC?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Derive the voltage gain of a differential amplifier with two op-amp.





12. Define the Common Mode Rejection Ratio (CMRR) and explain the significance of relatively large value of CMRR.
13. Explain instrumentation amplifier using transducer bridge with any one application.
14. In high frequency model of OPAMP a capacitor is included at the output terminal. What is its significance?
15. Draw first order high pass filter and obtain the frequency of high pass filter.
16. Draw the circuit diagram of V/F convertor. Calculate the output frequency for V/F convertor, if $V_{in} = 2V$, $C_{ref} = 200pF$ and $I_{in} = 10\mu A$.
17. Explain the D/A converter with R-2R network.
18. Explain the working of a fixed voltage regulator.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight **5** each.

19. Explain the working of a noninverting amplifier with feedback. Obtain expressions for its voltage gain, output resistance, bandwidth and total output offset voltage with feedback.
20. With the help of suitable circuit diagram and frequency response explain the working of op-amp differentiator. Derive the various expressions for op-amp differentiator.
21. Explain the principle of oscillator. With the help of circuit diagram obtain the oscillating frequency of Phase shift oscillator.
22. What is a comparator? Explain different types of comparators.

(2×5=10 weightage)

