



QP CODE: 25050518



25050518

Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION DECEMBER 2025

First Semester

M Sc PHYSICS

Core Courses - PH010104 - ELECTRONICS

2019 Admission Onwards

D5F58195

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Differentiate between inverting and non-inverting amplifiers.
2. Explain the total output offset voltage in the noninverting amplifier with feedback.
3. Explain input offset voltage.
4. Explain CMRR ratio.
5. What do you mean by compensating network? Explain the need for compensating network in OP-AMP.
6. What is the gain of the First Order LP Filter in the passband? How does this compare to the theoretical value? What is the roll off rate of the filter in the stop band?
7. Determine the cutoff frequency of the First Order HP Filter and compare to the theoretical value. Draw a graph and note the cut off frequency of the measured data.
8. What is a phase locked loop?
9. Why modulation is needed for analog communication?
10. What is the role of AGC in audio reception?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Compare the characteristics of non-inverting and inverting op-amp with feedback.
12. The differential input and output amplifier is used as a preamplifier and requires a differential output of at least 3.7V. Determine the gain of the circuit if the differential input $V_{IN} = 100mV$.





13. In a voltage to current converter with grounded load $V_{in} = 5V$, $R = 10K\Omega$ and $V_1 = 1V$. Find (a) the load current and (b) the output voltage V_0 . Assume that the op-amp is initially nulled.
14. Explain the effect of negative feedback on frequency response.
15. Draw the circuit diagram of square wave generator. Write the expression for output frequency.
16. Design an OP-AMP Schmitt Trigger circuit with an upper triggering voltage 0.5V and lower triggering voltage -0.5 V if $V_{sat} = 12V$
17. Obtain the expression for output voltage for a D/A convertor using R-2R ladder network . What is its advantage over D/A convertor with binary weighted resistors?
18. Prove that the phase discriminator is an FM demodulator.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Explain the closed-loop differential amplifiers configuration with one op-amp and two op-amps, Derive its voltage gain and input resistance.
20. Explain the difference between integrator and differentiator and give one application each.
21. Filters are frequency selective circuits, Why? With the help of circuit diagram explain band pass and band reject filters.
22. Explain the working of a V/F converter.

(2×5=10 weightage)

