



QP CODE: 23145386



Reg No :

Name :

M Sc DEGREE (CSS) EXAMINATION, DECEMBER 2023

First Semester

M Sc PHYSICS

CORE - PH010104 - ELECTRONICS

2019 ADMISSION ONWARDS

C82C41BF

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What is a differential amplifier?
2. What is a voltage follower?
3. What are the difference between input offset voltage and input offset current?
4. Write short notes on AC amplifier and DC amplifier.
5. How does the roll off the Second Order LP Filter compare to that of the First Order LP Filter? Draw a graph of each on the same axis noting the cutoff frequencies and the slope in the stop band.
6. Explain bandpass filters
7. Draw the block diagram of VCO and explain it.
8. What are the limitations of an OP-AMP as comparators?
9. What is the name of the circuit that is used to detect the peak value of the non-sinusoidal input waveforms? Explain its operation.
10. What are the advantages of stereo FM reception?

(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 one op-amp.
12. Explain voltage to current converter with grounded load.





13. Design a differentiator to differentiate an input signal that varies in frequency from 100Hz to 2KHz $C_1 = 0.1\mu F$. If a sine wave of frequency 1 KHz and $V_{pp} = 5mV$ apply. Find the output voltage.
14. Define frequency response of an OP-AMP. Draw frequency response of 741C.
15. Explain the difference between slew rate and transient response.
16. What is comparator? Explain the significance of reference voltage for an inverting comparator
17. The F/V converter is initially adjusted for $V - 0 = 2.8V$ at F_{inmax} of 10KHz. Determine the output voltage V_0 if $F_{in} = 1KHz$.
18. What is simple automatic gain control? What are its functions?

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Explain the working of an inverting amplifier with feedback. Obtain expression for its voltage gain, output resistance and bandwidth with feedback.
20. Draw the circuit diagram of instrumentation amplifier using transducer bridge and explain its working.
21. Explain the working of first and second order low pass filter.
22. Draw the internal architecture of IC555 and draw the circuit diagram of any one application and design the circuit.

(2×5=10 weightage)

