QP CODE: 24803639

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, JUNE 2024

Fifth Semester

INTEGRATED MSC BASIC SCIENCE-PHYSICS

CORE - IPH5CR05 - LINEAR INTEGRATED CIRCUITS

2021 Admission Onwards

799A7926

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions*

*Weight **1** each.*

1. Why an Op-amp is called as operational amplifier?
2. What does the abbreviation "SOIC" stand for in IC packaging?
3. Define input bias current of Op-amp.
4. Define voltage series feedback.
5. Draw the diagram of non-inverting adder.
6. What do you mean by oscillator?
7. What is the role of the operational amplifier in a sawtooth oscillator circuit?
8. What do you mean by filters?
9. Draw the frequency response of low pass active filters.
10. What is a multivibrator?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Draw the circuit symbol of op-amp. Explain what is mean by inverting input and non-inverting input.
12. For the non-inverting amplifier given that input voltage is 3V and R1=1KΩ and Rf=10KΩ. Calculate the output voltage.

13. Derive an expression for the output voltage of a summing amplifier with virtual ground.

14. Draw the diagram of integrator and differentiator circuit.

15. Draw the diagram of integrator and adder circuit.

16. Explain the use of IC-555 timer as a pulse stretcher

17. Draw the neat diagram of monostable multivibrator using external connection and explain it in detail.

18. Calculate the duty cycle for the astable multivibrator using IC-555. Given that RA=RB=1KΩ and C=1000PF.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain the concept of a summing amplifier and its application in signal processing. Discuss how a summing amplifier can be used to combine multiple input signals into a single output signal.

20. Discuss how negative feedback affects the input resistance of an op-amp circuit. Provide a step-by-step derivation of the input resistance with feedback for a non-inverting amplifier configuration. Explain the practical implications of this change in input resistance in op-amp circuits.

21. Differentiate between the comparator and Schmitt trigger.

22. Explain the concept of a bandpass filter and its application in signal processing. Discuss the basic principles behind the operation of a bandpass filter and the key parameters that characterize its performance.

(2×5=10 weightage)