Reg. No ..... Name **24P1052**

M.Sc. DEGREE END SEMESTER EXAMINATION - NOVEMBER 2024

SEMESTER 1 : PHYSICS

COURSE : **24P1PHYT04 : ELECTRONICS**

(For Regular - 2024 Admission)

Duration : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	List the four negative feedback configurations. Which two configurations are most commonly used?	(R)
2.	List two special cases of inverting amplifiers. Which one is most widely used and why?	(U)
3.	List the most commonly used filters.	(U)
4.	What is slew rate? List causes of the slew rate and explain its significance in applications	(R)
5.	What is Butterworth response?	(R)
6.	List the three open-loop Op-amp configurations? Why they are not widely used in linear applications?	(R)
7.	What is the difference between compensated and non-compensated op-amps?	(R)
8.	What is the difference between a basic comparator and the Schmitt trigger?	(A)
9.	Discuss the applications of Phase locked loops.	()
10.	Explain the effect of negative feedback on frequency response?	(R)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	With proper block diagram, explain the working of a superheterodyne radio receiver?	(R)
12.	Briefly explain a voltage-to-current converter with grounded load?	(A)
13.	Design a second order low-pass filter at a high cutoff frequency of 1 kHz. Also draw the frequency response of the same.	(A)
14.	For a closed loop non-inverting amplifier using IC 741 has the following specifications. R_1=470 Ω and R_F= 4.7 KΩ: A=400,000, R_i=33 MΩ, R_o=60 Ω, f_o=5Hz,UGB= 0.6 MHz, supply voltage=±15 V, output voltage swing=±13 V. Calculate the output voltage and then sketch it if the input is 100 mV pp sine wave at 1 kHz. Assume that the op-amp is initially nulled.	(An)
15.	Draw the basic block diagram of a communication system. Also explain the function of each block?	(U)
16.	Design a wide band-reject filter having f_H =200 Hz and f_L= 1 kHz.	(R)
17.	Explain the working of a Differentiator?	(R)
18.	The 741C is configured as a closed loop inverting amplifier with R_1=1 kΩ and R_F= 10 KΩ. Calculate exact closed loop gain and ideal closed loop gain. Given the specifications are A=200,000, R_i=2 MΩ, R_o=75Ω, fo=5Hz,UGB= 1 MHz, supply voltage=±15 V, output voltage swing=±13 V.	(A)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19. With the help of suitable circuit diagram, explain the working of triangular wave generator? (A)

20. With proper theory explain the working of a (i) Binary weighted D/A converter and (ii) Successive approximation A/D Converter. (A)

21. Explain a voltage-to-current converter with floating load. Discuss how it is used in low voltage ac and dc voltmeters? (R)

22. (a) With the help of suitable circuit diagrams and necessary theory, derive the expressions for (i) voltage gain and (ii) input resistance of a voltage series feedback amplifier. (b) The 741C op-amp having the following parameters is connected as a closed loop non-inverting amplifier with R_1=1 KΩ and R_F=10 KΩ: A=200,000, R_i=2 MΩ, R_o=75Ω, f_o=5Hz, supply voltage=±15 V, output voltage swing=±13 V. Compute the values of AF, R_{iF},R_{oF},f_{oF} and V_{ooT}. (R)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;