

Faculty of Science

B.Sc (Electronics) II-Year, CBCS-IV Semester Backlog Examinations –Jan, 2023

PAPER: Linear Integrated Circuits and Basics of Communication

Time: 3 Hours

Max Marks: 80

Section-A

- I. Answer any *eight* of the following questions (8x4=32 Marks)
1. Explain the need for differential amplifier.
 2. Describe the working of op-amp as a logarithmic amplifier.
 3. An inverting amplifier has $R_1 = 10 \text{ k}\Omega$ and $R_f = 100 \text{ k}\Omega$. Calculate the output voltage for an input voltage 0.4 volt.
 4. Draw the circuit of Triangular wave generator using op-amp and explain.
 5. Using OP-AMP explain how voltage regulation can be achieved.
 6. Draw the block diagram of IC-555 timer and describe its working.
 7. Give the theory and working of diode detector to detect the AM signals.
 8. Explain the need for modulation.
 9. A modulated carrier wave has maximum and minimum amplitudes of 750 mV and 250 mV. Calculate the value of percentage modulation.
 10. Compare AM and FM.
 11. Derive the expression for spectrum of F.M. Wave.
 12. Write about PAM, PCM?

Section-B

- II. Answer the following questions (4x12=48 Marks)
13. (a) What are the characteristics of an ideal Op-Amp? Draw the block diagram of Op-Amp and explain each part.
(OR)
 - (b) What is a comparator? Describe how an OP-AMP can be used as a comparator and mention its uses.
 14. (a) Draw the circuit diagram of OP-Amp free running multi-vibrator and discuss its operation with help of relevant waveforms.
(OR)
 - (b) Explain with a neat diagram, how op-amp can be used to solve differential equations of second order.
 15. (a) Define side bands and band width? Derive expression for the fraction of total power carried by the side bands.
(OR)
 - (b) Draw the circuit diagram of Balanced modulator circuit and explain its working.
 16. (a) Give the theory of frequency modulation and explain the frequency spectrum of it.
(OR)
 - (b) What is phase modulation? Draw the circuit to generate pulse width modulation (PWM) and explain its working.

Faculty of Science

B.Sc (Electronics) III-Year, CBCS –IV Semester

Regular Examinations –June/July, 2022

PAPER: Linear Integrated Circuits and Basics of Communication

Time: 3 Hours

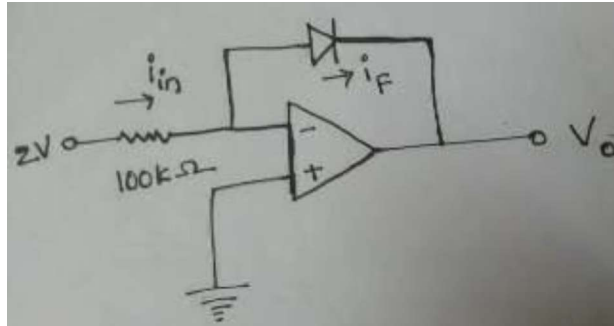
Max Marks: 80

Section-A

I. Answer any *eight* of the following

(8×4=32 Marks)

1. Mention the characteristics of an ideal Op-Amp.
2. Write a short note on Op-Amp as a voltage amplifier.
3. A differential amplifier has a voltage gain of 150 and a CMRR of 90db. The input signals are 50m V and 100m V with 1m V of noise on each input. Find (i) output signal (ii)the noise on the output.
4. Obtain output voltage using Logarithmic Amplifier using Diode.
5. Discuss Op-Amp as a Shunt Regulator.
6. Determine the output voltage of the circuit



7. Explain Modulation index.
8. Draw the block diagram of High level AM transmitter and explain.
9. An audio signal of 12 KHz is used to modulate a carrier of 1000KHz in AM modulator. Determine side band frequencies.
10. Explain the working of FM radio receiver.
11. What is the difference between PPM and PWM.
12. A 100MHz carrier wave frequency is modulated by a 50KHz.Sinusoidal modulating signal. If the maximum frequency deviation is 150Hz, determine the modulation factor?

Section-B

II. Answer the following questions

(4×12=48 Marks)

13. (a) Discuss the construction of closed-loop inverting amplifier with a neat circuit and explain its frequency response.

(OR)

- (b) With the help of a neat circuit diagram explain how Op-Amp is used as an Inverting summing amplifier. Discuss how the same circuit may be modified to work as an averaging amplifier.

14. (a) What is multivibrator? With the help of a neat circuit diagram explain how Op-Amp is used as mono stable multivibrator.

(OR)

- (b) With the help of a neat circuit diagram explain how 555 timer is used as an Astable multivibrator. And obtain frequency and duty cycle.

15. (a) Explain the frequency spectrum of amplitude modulation and discuss the operation of balanced modulator with a circuit.
(OR)
(b) What are the essentials of demodulation of a AM wave. Explain the working of a diode detector.
16. (a) How FM waves are generated? Describe the working of simple frequency modulator.
(OR)
(b) Discuss the Pulse-Amplitude Modulation(PAM) and Pulse-Code Modulation(PCM) with neat diagram.
