

III B. Tech I Semester Supplementary Examinations, June/July-2022
LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
 All Questions Carry Equal Marks

UNIT-I

1. a) Draw the ac equivalent circuit of single input balanced output differential amplifier and explain its operation. [8M]
- b) List out the various AC characteristics of Op-amp and explain them. [7M]

(OR)

2. a) Draw the circuit diagram of a basic differential amplifier and explain its transfer characteristics. [8M]
- b) Draw the circuit for a 7905 voltage regulator IC and explain its working. [7M]

UNIT-II

3. a) Draw the circuit diagram of an op-amp differentiator and derive an expression for the output in terms of the input. [8M]
- b) Draw the circuit of a voltage to current converter if the load is (i) floating, and (ii) grounded. [7M]

(OR)

4. a) Draw the circuit diagram of an antilogarithmic amplifier using Op-Amps and explain its operation. [8M]
- b) An op-amp is being used as voltage-to-current converter. The value of resistance used in the circuit R is $6.8 \text{ k}\Omega$, $R_L = 2 \text{ k}\Omega$, $V_1 = 5 \text{ V}$, $V_2 = 0 \text{ V}$. Determine the values of I_L , V_L and V_o . Draw the circuit. [7M]

UNIT-III

5. a) Design a wide band-reject filter having $f_H = 200 \text{ Hz}$ and $f_L = 1 \text{ kHz}$. Draw the circuit and assume necessary data. [8M]
- b) For the circuit shown, in Fig.1, if $R = 22 \text{ k}\Omega$ and $C = 0.01 \mu\text{F}$, determine the value of f_c . [7M]

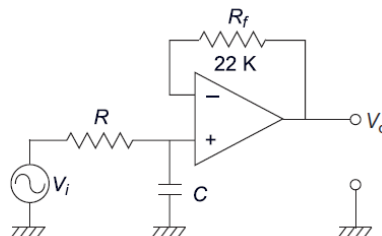


Fig.1



(OR)

6. a) Given a bandpass filter with the component values shown in below Fig.2, find its resonant frequency and bandwidth. [8M]

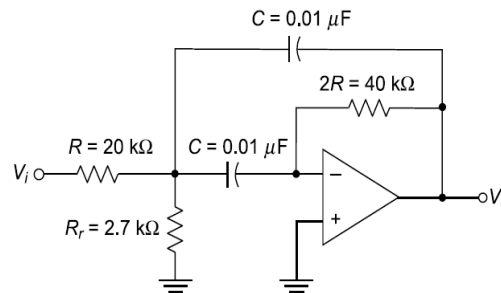


Fig.2

- b) Design a second order lowpass Butterworth filter with a cut-off frequency of 12 kHz and unity gain at low frequency. Also determine the voltage transfer function magnitude in dB at 15 Hz for the filter. [7M]

UNIT-IV

7. a) Explain the operation of a Schmitt trigger using IC 555. [8M]
b) Explain the application of PLL as a frequency multiplier with a neat diagram. [7M]

(OR)

8. a) What is the principle of monostable multivibrator? Explain. [7M]
b) Draw the block diagram of IC 566 VCO and explain its operation. [8M]

UNIT-V

9. a) Explain the operation of weighted resistor type of DAC with a neat diagram and also write its advantages. [8M]
b) Explain in detail the operation of 3-bit parallel ADC with a neat circuit diagram. [7M]

(OR)

10. a) Draw the simplified block diagram of a successive approximation ADC and explain its working. [8M]
b) Explain the differences between current-mode and voltage-mode R-2R ladder D/A converters. [7M]

