22423

23124

3 Hours / 70 Marks Seat No.

Marks

1.   **Attempt any <u>FIVE</u> of the following :**   **10**

a) Define operational amplifier parameters

   i)   Input bias current

   ii) Slew rate

b) Draw and explain sign changer circuit using op-amp.

c) List four specifications of ICLM324.

d) State four applications of Instrumentation amplifier.

e) State two merits of active filter over passive filter.

f) Define with respect to filter

   i)   Q-Factor

   ii) Pass band

g) State the features of IC-555.

Marks

2.   **Attempt any THREE of the following :**   **12**

a) Draw block diagram of OP-AMP and state function of each block.

b) List the ideal characteristics of op-amp with their ideal values. Any four.

c) Draw the neat circuit diagram of first order high pass filter and explain its operation.

d) Explain the block diagram of phase locked loop.

3.   **Attempt any THREE of the following :**   **12**

a) Sketch the circuit diagram of closed loop non-inverting amplifier and derive expression for its gain.

b) Draw only circuit diagram of Instrumentation amplifier using three op-amp. Write its output equation.

c) Explain circuit diagram of logarithmic amplifier using Op-amp.

d) Sketch the astable multivibrator using IC-555 and explain it.

4.   **Attempt any THREE of the following :**   **12**

a) Compare open loop and close loop configuration on the following basis

i)   Circuit diagram

ii) Gain

iii) Bandwidth

iv) Applications

b) Design the circuit to get output voltage $V_0 = 3V_1 + 2V_2$ where V_1 and V_2 are input voltages.

c) Sketch first order Butterworth low pass filter with component values at cut-off frequency of 12 KH_2 with passband gain of 2.

d) Explain phase shift oscillator using IC 741 with neat diagram.

e) Explain the working of PLL as frequency multiplier using block diagram.

Marks

5.   **Attempt any TWO of the following :**   **12**

a) Draw a circuit diagram of V to I converter with floating load. Derive expression for its output. List any two applications.

b) Explain Schmitt trigger circuit using op-amp and how UTP and LTP are calculated.

c) Design second order Butterworth high pass filter of cut-off frequency 10 KH_z. Draw circuit with component values.

6.   **Attempt any TWO of the following :**   **12**

a) Draw inverting summing amplifier and derive the expression for its output.

b) Explain the function of sample and hold circuit by using op-amp.

c) From circuit diagram given in Fig. No. 1 identify the name of the circuit and calculate cut-off frequency and pass band gain.
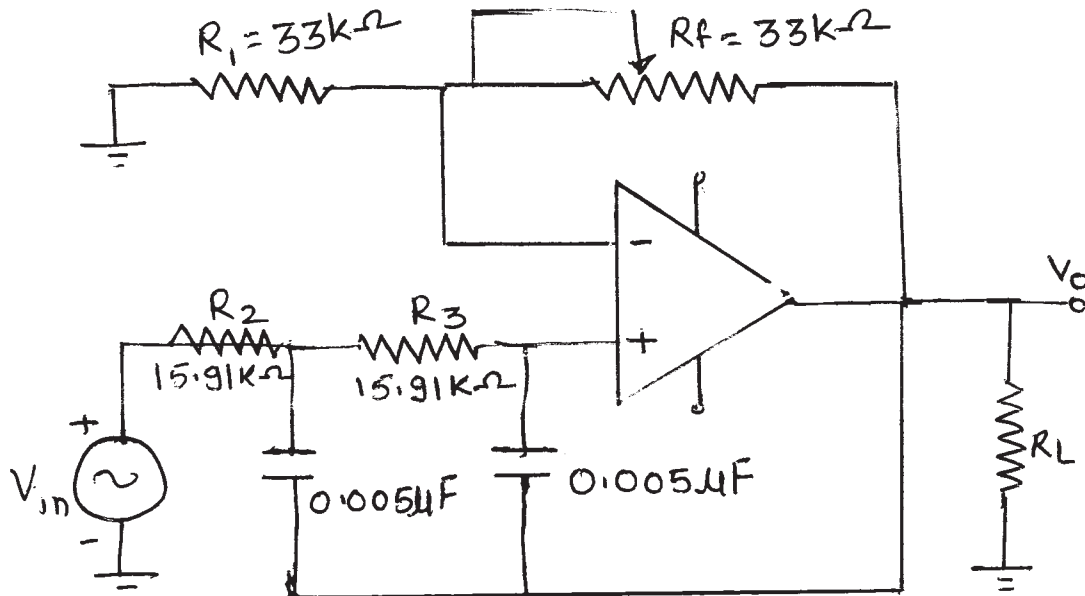

Fig. No. 1

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