

22382

22223

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following:

10

- a) Classify amplifiers based on
 - i) Output signal
 - ii) Frequency response
- b) State ideal value of given parameters for op-amp IC741.
 - i) CMRR
 - ii) Slew rate
 - iii) Input bias current
 - iv) Gain band width product
- c) Draw circuit diagram of op-amp based integrator.
- d) Compare inverting and non inverting amplifier based on any two points.
- e) State the function of following pins of IC555.
 - i) Control voltage
 - ii) Trigger
- f) List the uses of heat sink. (any two)
- g) State line and load regulations.

P.T.O.

2. Attempt any THREE of the following: 12

- Draw the circuit diagram of floating load type V to I converter and derive expression for its O/P.
- Explain transformer coupled CE amplifier with neat labelled circuit diagram.
- Explain the working of PLL with its block diagram.
- Explain with neat diagram the significance of virtual ground in an op-amp.

3. Attempt any THREE of the following: 12

- Explain the working of class B push pull amplifier with neat circuit diagram.
- Explain the working of monostable multivibrator with circuit diagram and waveform using op-amp.
- Draw a well labelled circuit diagram for given input and output waveform. Refer Fig. No. 1.

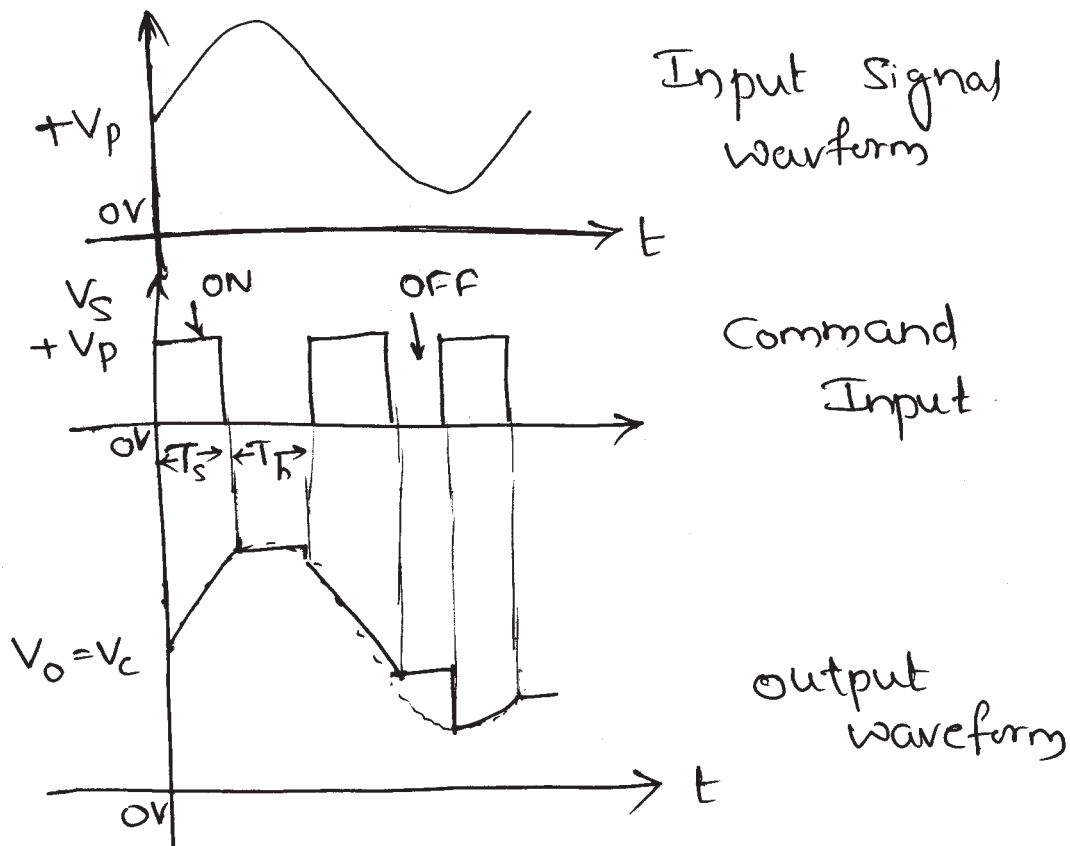


Fig. No. 1.

- d) Calculate the output voltage if $V_1 = V_2 = 0.15V$ as shown in Fig. No. 2.

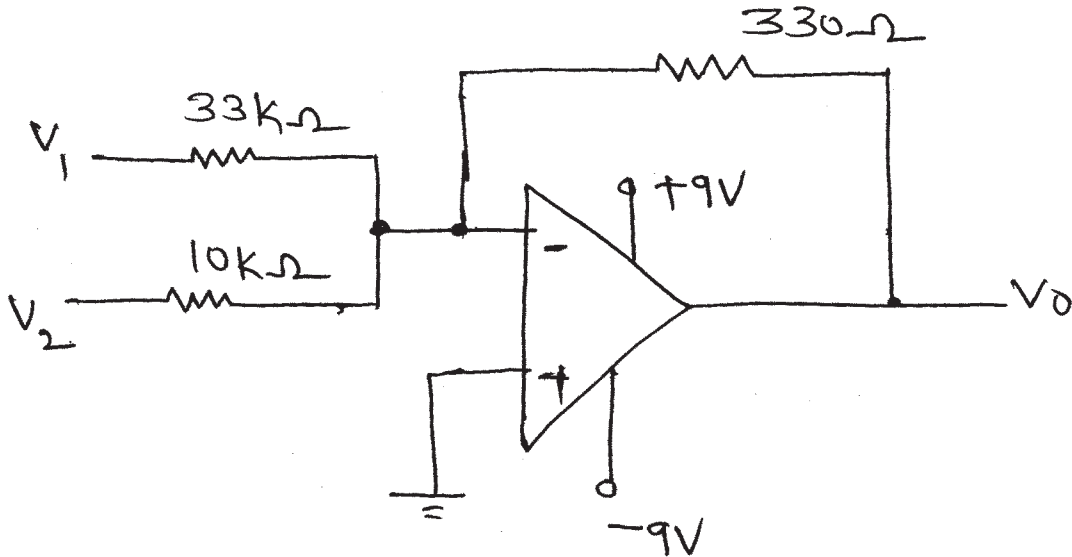


Fig. No. 2.

4. Attempt any THREE of the following: 12

- a) Draw the pin diagram of IC723 and state the function of each pin.
- b) Draw the block diagram of IC555.
- c) Explain open loop and closed loop configuration of op-amp IC741 with neat circuit diagram.
- d) In the given circuit Fig. No. 3. Calculate the value of output voltage. Where R_f, R_{in1}, R_{in2} and R_{in3} are 100Ω each. $V_1 = 10V, V_2 = 5V$ and $V_3 = 7V$.

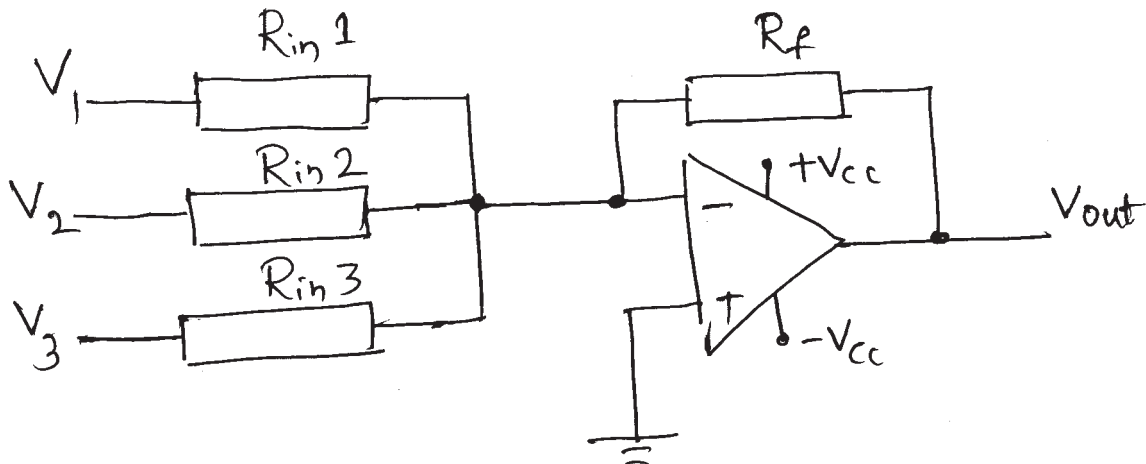


Fig. No. 3.

- e) Calculate the gain limiting frequency for the circuit.
Refer Fig. No. 4.

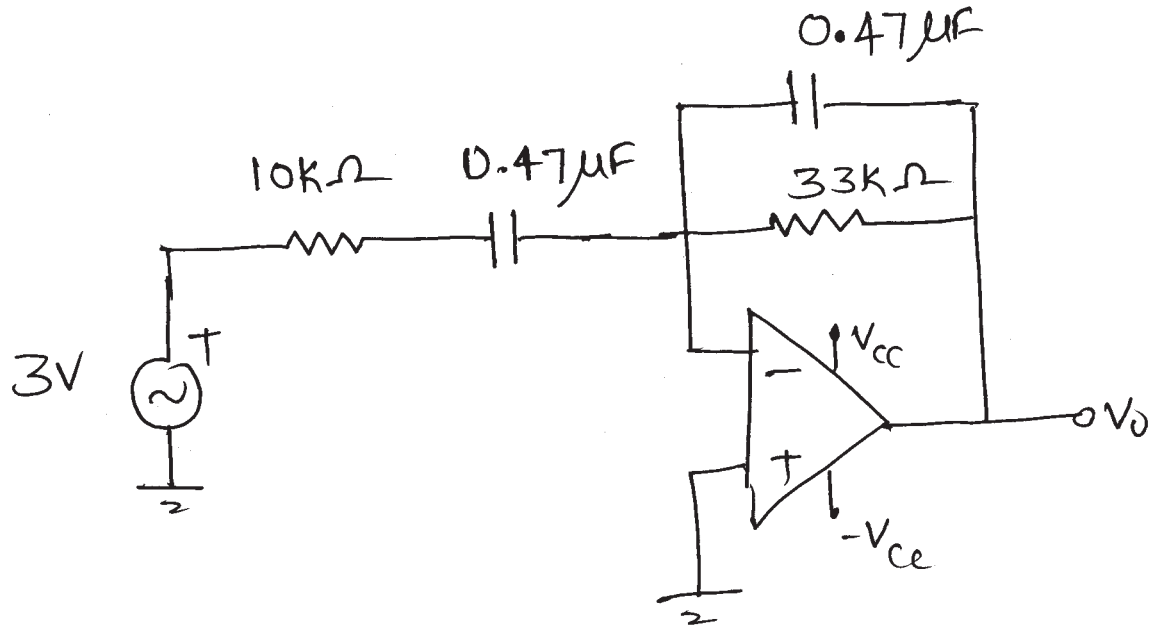


Fig. No. 4.

5. Attempt any TWO of the following:

12

- a) Explain with neat circuit diagram RC coupled amplifier. Compare RC coupled, Direct coupled, Transformer coupled amplifier. (ant four points)
- b) For the following equation, draw the circuit diagram and explain its operation. Draw the output waveform for square wave input.

$$V_0 = \frac{1}{R_i C_f} \int_0^t V_{in} dt + C$$

- c) An op-amp monostable circuit is constructed using following components. $R_1 = 30\text{K}\Omega$, $R_2 = 30\text{K}\Omega$, $R = 150\text{K}\Omega$ and $C = 1.0\mu\text{F}$. If the op-amp monostable circuit is supplied from $\pm 12\text{V}$ supply and timing period is initiated with 10 ms pulse.

Calculate the circuit timing period, capacitor recovery time, total time between trigger pulses and differentiator network values. Refer Fig. No. 5.

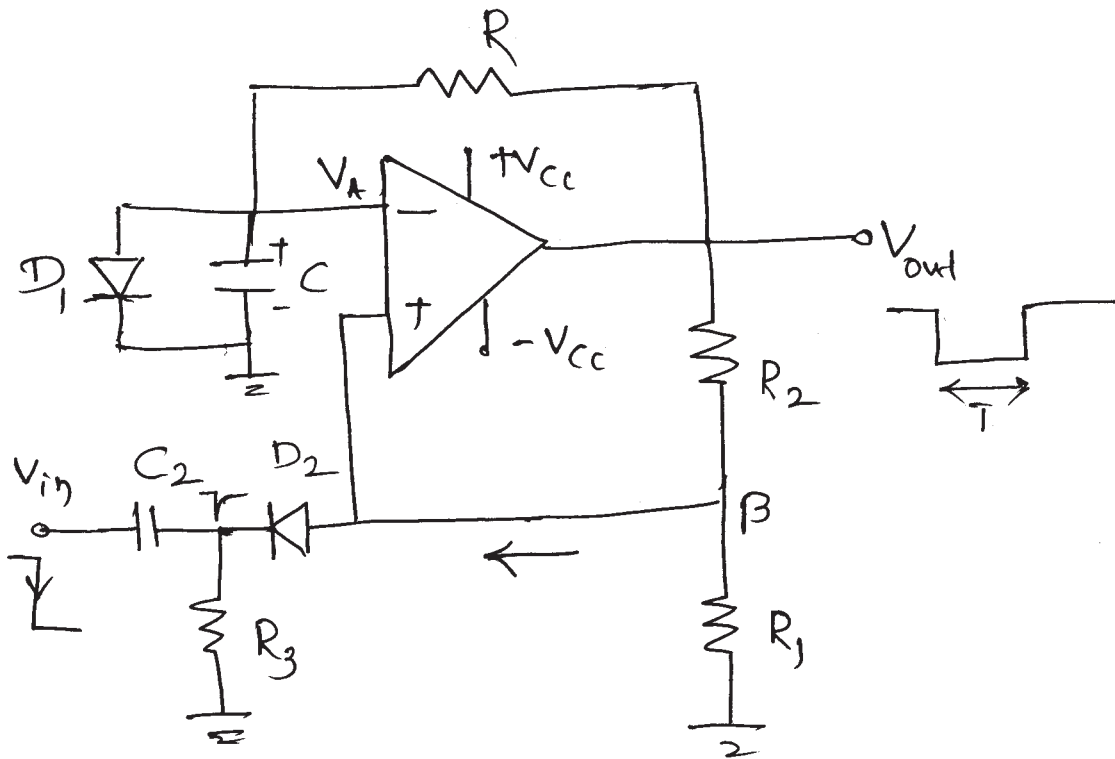


Fig. No. 5.

6. Attempt any TWO of the following:

12

- Compare fixed voltage regulators 78xx and 79xx (any six points).
- The output V_0 of ideal op-amp used in the circuit shown in Fig. No. 6. is 5V. Then the value of R_L in $K\Omega$?

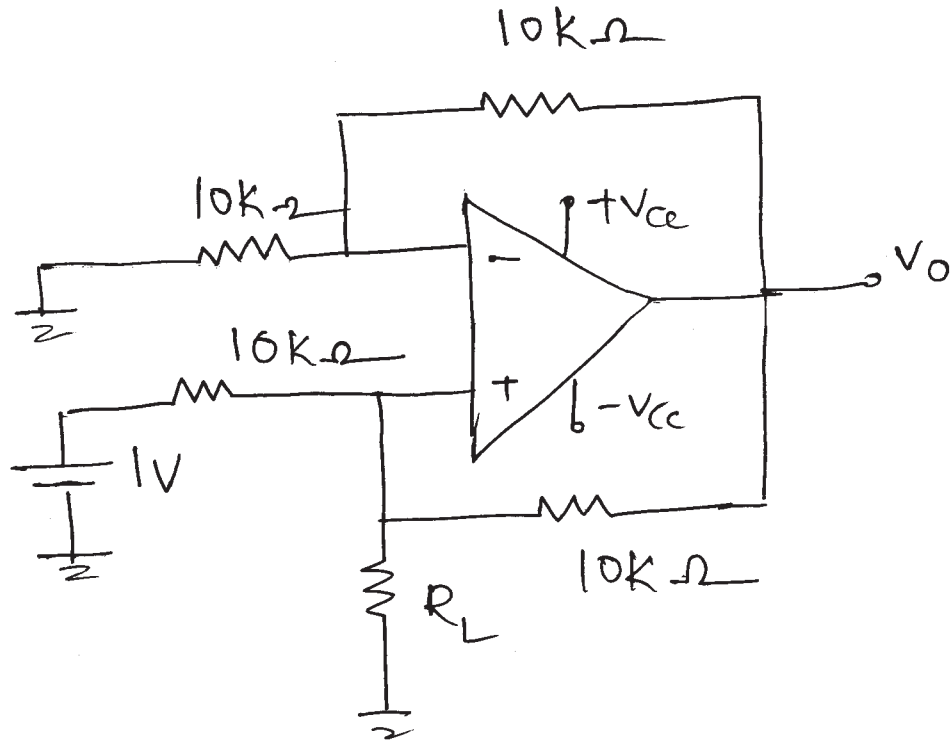


Fig. No. 6.

- Explain PLL as multiplier.
 - Draw the pin diagram of IC565 and state the function of each pin.