

(3 Hours)

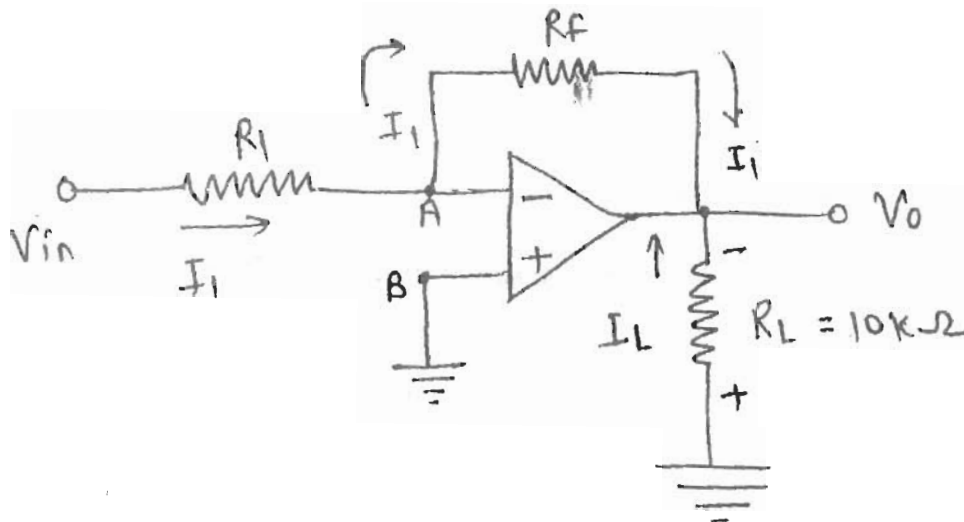
[Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.
 (2) Solve any **four** questions from remaining **six** questions.
 (3) Assume **suitable** data wherever **necessary**.

1. Solve any **five** :—

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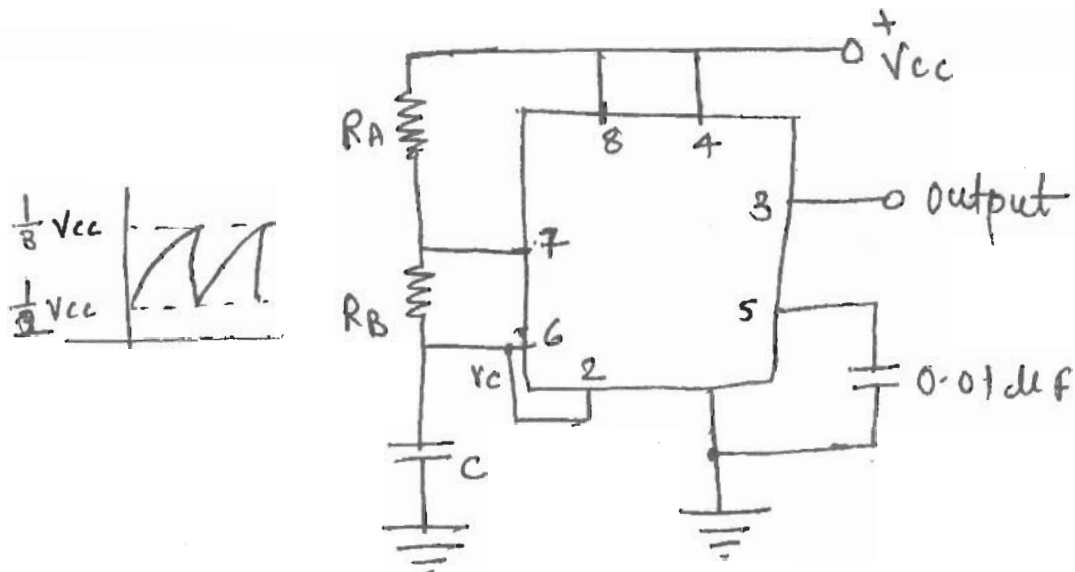
- (a) Explain the operation of a basic differential amplifier.
 (b) Define following parameters of Op-Amp :—
 (i) Input bias current
 (ii) Input offset current
 (iii) Slew Rate
 (iv) CMRR.
 (c) In the **figure**, an inverting amplifier is shown with $R_1 = 20 \text{ k}\Omega$ and $R_f = 100 \text{ k}\Omega$. A load of $10 \text{ k}\Omega$ is connected to the output with input voltage of 0.7 V . Calculate —
 (i) I_1
 (ii) V_o
 (iii) I_L
 (iv) Total current I_o



- (d) Explain about inverting and non-inverting amplifier.
 (e) What is peak detector ?
 (f) List different applications of PLL.
 (g) Explain about V to F converter.
2. (a) Design a practical integrator circuit with a d.c. gain of 10 to integrate a square wave of 10 kHz. 10
 (b) Explain in detail about instrumentation amplifier. 10
3. (a) Explain with design about First Order Low Pass filter. 10
 (b) Explain in detail about :— 10
 (i) Switched capacitor filter
 (ii) KRC filter.

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4. (a) What is Comparator ? Explain in detail about Schmitt trigger. 10
 (b) With neat diagram and waveform, explain in detail about Astable Multi-Vibrator. 10
5. (a) Explain in detail about Successive Approximation method of A to D conversion. 10
 (b) What is the function of Voltage Regulator ? Explain in detail about Fixed Voltage Series Regulator. 10
6. (a) 10



In the above figure, for $R_A = 6.8 \text{ k}\Omega$, $R_B = 3.3 \text{ k}\Omega$ and $C = 0.1 \mu\text{F}$, calculate —

- t_{HIGH}
 - t_{LOW}
 - free running frequency
 - duty cycle D .
- (b) What is RC phase shift oscillator ? Explain in detail. 10
7. Write short notes on any four :— 20
- Current to voltage converter
 - R-2R Ladder DAC converter
 - Phase Locked Loop
 - Sawtooth waveform generator
 - Precision Rectifier.