

Q-3 A Attempt any Two [16]

- 1 Explain the working of a wien-bridge oscillator with a neat diagram
- 2 With a neat labelled circuit diagram explain the use of OP-amp as Differentiator
- 3 Explain the working of a phase shift oscillator with a neat diagram
- 4 With a neat labelled circuit diagram explain the use of OP-amp as Summing amplifier

B Attempt any One [4]

- 1 A Colpitts oscillator is designed by using the following passive components. Calculate the frequency of oscillation? $C_1=0.02 \mu\text{F}$, $C_2=0.002 \mu\text{F}$ and $L=10 \mu\text{H}$
- 2 What would be the output voltage of the non-inverting amplifier for $V_i = 5\text{V}$, $R_f = 25\text{K}\Omega$ and $R_i = 10 \text{K}\Omega$

Q-4 A Attempt any One [5]

- 1 What is faithful amplification? State the conditions to be fulfilled to achieve it.
- 2 Write short note on "Thermal runaway"

B Attempt any One [5]

- 1 Simplify
a) $(1101)_2 = (\dots?)_{10}$ b) $(000:1110)_2 = (\dots?)_{16}$
c) $(5\text{DB})_{16} = (\dots?)_2$ d) $(12)_{10} = (\dots?)_2$
e) $(0:25)_{10} = (\dots?)_2$

- 2 Explain clocked RS flip flop

C Attempt any One [5]

- 1 OP-amp as Integrator uses following components $R=100 \text{K}\Omega$, $C=1 \mu\text{F}$, $V_{cc} = \pm 15\text{V}$. Obtain the output voltage of an OP-amp Integrator after 0.5 sec. for the input voltage 2.5V d.c.
 - 2 In a wien-bridge oscillator, if a capacitor is of order 15.9pF and resistor 10 K Ω , find a frequency of oscillation.
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