

Con. 3447-10.

(REVISED COURSE)

AN-4216

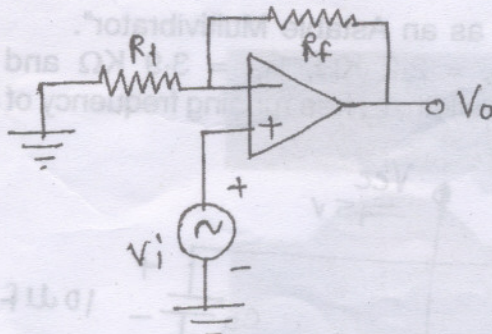
(3 Hours)

[Total Marks : 100

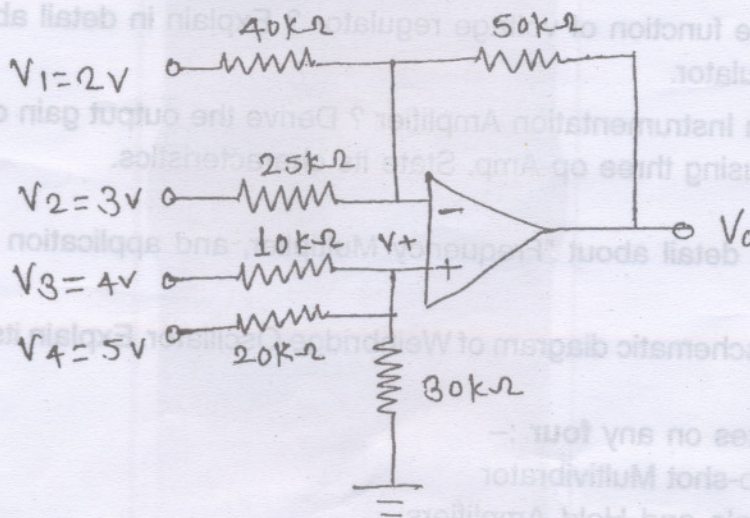
- N.B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume suitable data if required and state it clearly.
 (4) Figures to the right indicate full marks.

1. (a)

10

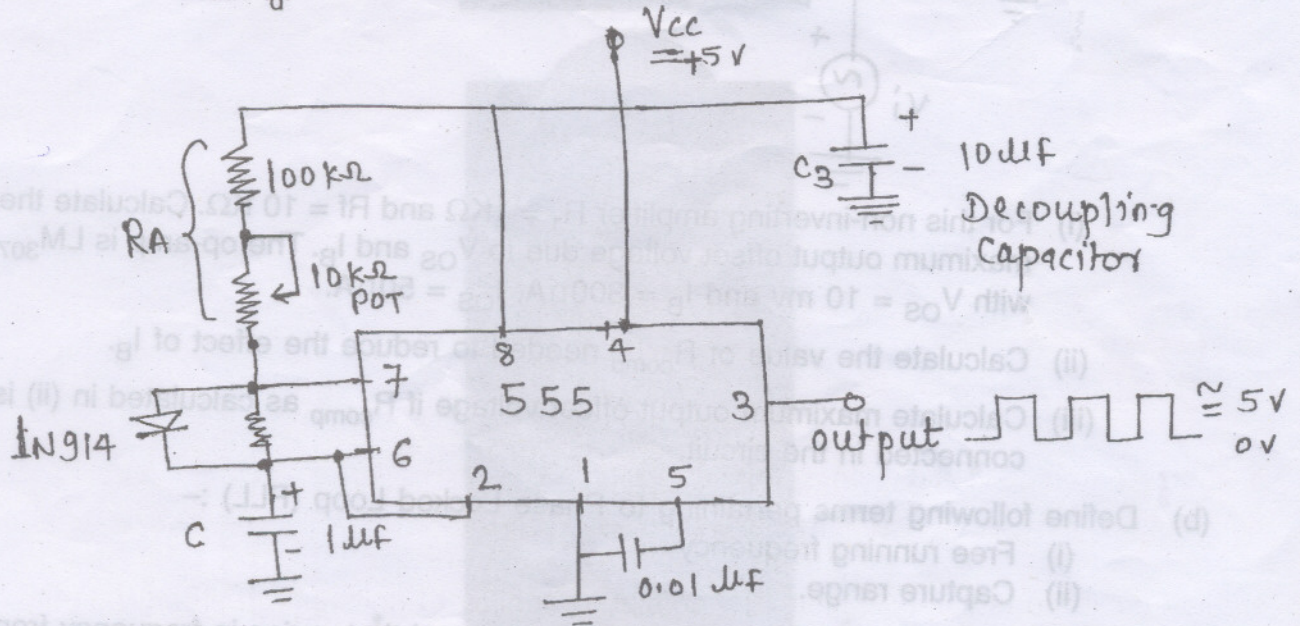


- (i) For this non-inverting amplifier $R_1 = 1\text{K}\Omega$ and $R_f = 10\text{K}\Omega$. Calculate the maximum output offset voltage due to V_{OS} and I_B . The op-amp is LM307 with $V_{OS} = 10\text{mv}$ and $I_B = 300\text{nA}$, $I_{OS} = 50\text{nA}$.
- (ii) Calculate the value of R_{comp} needed to reduce the effect of I_B .
- (iii) Calculate maximum output offset voltage if R_{comp} as calculated in (ii) is connected in the circuit.
- (b) Define following terms pertaining to Phase Locked Loop (PLL) :- 5
- (i) Free running frequency
- (ii) Capture range.
- (c) Design a differentiator to differentiate input signal that varies in frequency from 10 Hz to about 1 KHz. 5
2. (a) Find V_0 for the adder-subtractor shown in given figure - 10



- (b) What is difference between normal rectifier and precision rectifier? With proper derivation and circuits, explain the working of full wave rectifier. 10

3. (a) Design a Second-order low pass filter at a high cut-off frequency of 1KHz. Draw 10
frequency response of the network.
- (b) What is comparator ? Draw the characteristics of an ideal comparator and that of 10
a commercially available comparator. What is the difference between a basic
comparator and the schmitt trigger ?
4. (a) (i) Explain about "The IC 555 as an Astable Multivibrator". 10
(ii) In the following circuit $R_A = 2.2 \text{ K}\Omega$, $R_B = 3.9 \text{ K}\Omega$ and $C = 0.1 \mu\text{F}$.
Determine the positive pulse width, t_c , free running frequency of negative pulse
width t_d .



- (b) Compare different types of ADCs based on their working principle. Explain working 10
of any one type of Analog to Digital converter.
5. (a) What is the function of voltage regulator ? Explain in detail about fixed voltage 10
series regulator.
- (b) What is an Instrumentation Amplifier ? Derive the output gain of Instrumentation 10
Amplifier using three op-Amp. State its characteristics.
6. (a) Explain in detail about "Frequency Multiplier, and application of Phase Locked 10
Loop".
- (b) Draw the schematic diagram of Weinbridge Oscillator. Explain its working in detail. 10
7. Write short notes on any four :- 20
- Mono-shot Multivibrator
 - Sample and Hold Amplifiers
 - Precision Rectifiers
 - Inverting Amplifier
 - Analog Switches.