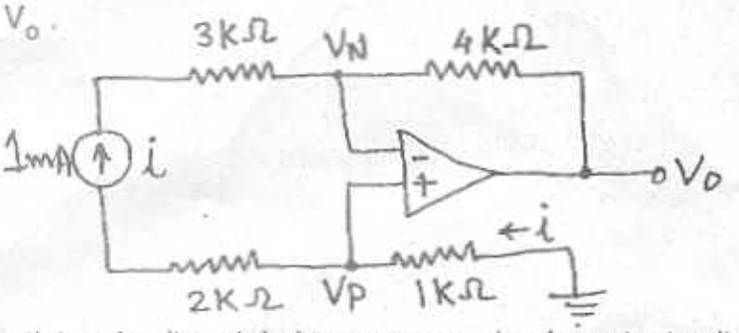
TE ETRX I (REV)
Linear Integrated Circuits & Design

Con. 3441-11. **RK-2242**

(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) Find V_N, Vp and V_o. 5



(b) Draw basic differentiator circuit and derive an expression for output voltage. Explain why this circuit is sensitive to high frequency noise. 5
(c) What is roll of rate of first order filter ? 5
(d) Draw circuit diagram for peak detector and explain working. 5

2. (a) Derive the expression for "Q" and cutoff frequency for second order Low pass KRC filter. 10
(b) Draw neat functional diagram of PLL IC 565 and explain the following terms alongwith the working of this PLL :– 10
(i) Free running frequency
(ii) Capture range,
(iii) Lock range. 10

3. (a) Draw simplified Op-amp circuit diagram and explain the following stages alongwith the working of this circuit :– 10
(i) Input stage,
(ii) Second stage
(iii) Output stage.
(b) Draw the circuit diagram of three Op-amp instrumentation amplifier. Get an expression for the output. State its characteristics. 10

4. (a) Design the non-inverting Schmitt trigger for getting a hysteresis width of 6 V. Assume the saturation voltages to be $\pm$ 12 V. 5
(b) Draw the circuit diagram of Schmitt trigger using 555 timer and explain its operation. 5
(c) Explain in detail about phase shift oscillator. 10

5. (a) Design a 0·5 A current source using IC 7805. Assume $R_L = 10\ \Omega$. 10
(b) What are the different types of Digital to analog converters ? Explain one of the technique in detail. 10

6. (a) Design a monostable 555 timer circuit to produce an output pulse 10 sec. wide. Draw the circuit diagram. 5
(b) Explain how a missing pulse can be detected using IC 555. 5
(c) Draw and explain the circuit diagram to generate square and triangular waveform using Op-amp. 10

7. Write notes on (any **two**):– 20
(a) State variable filters.
(b) Voltage to Frequency converters.
(c) Current feedback amplifier.
(d) Analog switches.