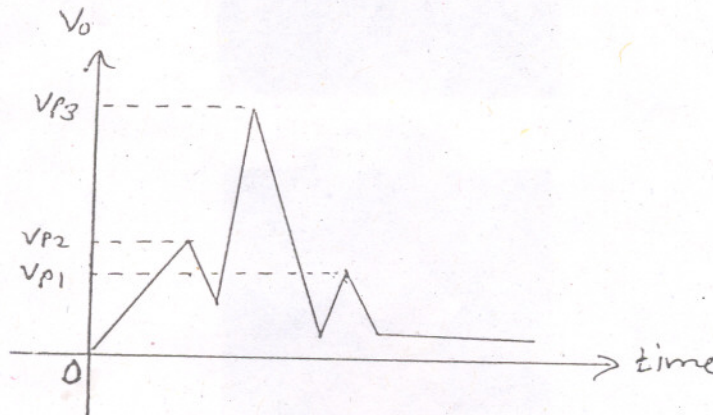


- N.B.** (1) Question No. 1 is compulsory.
(2) Attempt any four questions from remaining.
(3) Assume suitable data if necessary and state them clearly.

1. (a) It is required to detect the minimum peak value (V_{p1}) of the waveform shown in figure. Suggest the circuit for the same. Explain its working. 10



- (b) Explain, how a missing pulse can be detected using IC 555. 10
2. (a) Draw the circuit diagram of 2nd order high pass KRC filter. Derive an expression for gain Frequency (cut-off) and Q. 10
(b) Design an Inverting Schmitt trigger to achieve hysteresis of 7 V. 10
3. (a) Design astable multivibrator using IC 555 for 50% duty cycle without using diode. Take case that the pin 7 of IC 555 should not get connected directly to V_{cc} which may damage the internal transistor. 15
(b) Draw the circuit diagram of two op-amp instrumentation amplifier. Period an expression for the output. 5
4. (a) Draw the neat circuit diagram of full wave precision rectifier with minimum component spread. Explain its working with appropriate sketches and derive the expression for output voltage. 10
(b) Design a phase shift oscillator to oscillate with Frequency of oscillation $F_0 = 1$ kHz. How to adjust the peak-to-peak output voltage ? 10
5. (a) Design a voltage regulator using IC 723 to regulate the output voltage between 4 V to 20 V and output current of 500 mA. 10
(b) Draw the circuit diagram of temperature compensating logarithmic amplifier and derive an expression for output. 10
6. (a) Draw the functional block diagram of Dual-slop ADC. Explain its working with neat sketches. 10
(b) Draw the circuit diagram to generate square and triangular waveform using op-amp. Derive an expression for frequency and state limitation on the frequency range of operation. 10
7. Write a short notes on :— 20
(a) Phase locked loop monolithic
(b) Sample and Hold circuit
(c) Gyrator
(d) Waveform generator IC 8038.