

Day: Tuesday
Date: 13/11/2018

W-2018-2347

Time: 02.30 PM TO 05.30 PM
Max Marks. 60

N.B. :

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks
 - 3) draw the labeled diagrams **WHEREVER** necessary
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- Q.1** a) Compare the ideal and practical characteristics of an op-amp. **(07)**
b) Draw the block diagram of a general op-amp. **(03)**

OR

Define following terms: **(10)**

- i) CMRR ii) PSRR iii) Slew rate iv) Bandwidth v) Input bias current

- Q.2** a) Describe and draw the output waveforms of an ideal integrator circuit when the input is **(06)**

- i) Sine wave ii) Square wave iii) Step input

- b) Draw the circuit diagram of voltage follower. Also describe its operation along with waveform. **(04)**

OR

Draw circuit diagram and derive output equations for inverting and non-inverting amplifier using op-amp **(10)**

- Q.3** Design an inverting schmitt trigger for a UTP of 5V and LTP of 3V. Assume $\pm V_{CC} = \pm 15V$. Also draw its output waveform for sine wave input and hysteresis. **(10)**

OR

Describe the theory of full wave precision rectifier using an op-amp with its derivation and waveforms. **(10)**

- Q.4** Assuming $\pm 15V$ supply, design an IC8038 saw tooth waveform generator with $f_0 = 1KHz$ and % duty cycle = 99%. The circuit must have provision for frequency adjustment over $\pm 30\%$ range. **(10)**

OR

What is meant by filter? Draw the circuit diagram for the following **(10)**

- i) 3rd order low pass filter
- ii) Wide band pass filter
- iii) All pass filter

- Q.5** Draw the circuit diagram of an astable multivibrator using IC555 to generate the output signal with frequency of 3KHz and the duty cycle of 80%. **(10)**

OR

Draw and discuss the operation of following circuits using PLL. **(10)**

- i) Frequency multiplier
- ii) FM detector

- Q.6** Define following with respect to DAC **(10)**

- i) Accuracy ii) Conversion time iii) Settling time iv) Monotonicity v) Resolution

OR

Describe voltage to current converter with floating load and with grounded load with their circuit diagram. **(10)**

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