

Day: **Monday**
Date: **20/11/2017**

W-2017-2083

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 neat and labelled diagrams **WHEREVER** necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.

Q.1 Sketch op-amp DIP package for IC 741, show the typical terminal numbering system and state the function of each pin. **(10)**

OR

Q.1 What is input offset voltage? Discuss internal and external offset voltage compensation techniques with circuit diagram. **(10)**

Q.2 Draw a circuit diagram for a non-inverting amplifier using an op-amp graphic symbol. Discuss the circuit operation, and derive the equation for the closed loop voltage gain. **(10)**

OR

Q.2 Draw a circuit diagram for a basic integrator using an op-amp. Derive its output equation. Also draw output waveforms for sine and square wave input. **(10)**

Q.3 a) What is window detector? Describe its operation with circuit diagram and waveforms. **(07)**

b) Draw the circuit diagram of temperature compensated log amplifier using an op-amp. **(03)**

OR

Q.3 Draw the circuit of full -wave precision rectifier. Derive its output for sine wave input. Also draw the output waveform for sine wave input. **(10)**

Q.4 Draw a circuit diagram for an all-pass phase- lag filter. Sketch the typical phase/ frequency response and discuss the circuit operation. **(10)**

OR

Q.4 Design a first order low-pass filter using an op-amp with cut off frequency of 1KHz with pass band gain of 2. **(10)**

Q.5 Sketch the basic circuit diagram of an astable multi- vibrator using a 555 timer with two resistors and a capacitor. Show the capacitor and output waveforms and describe the circuit operation. **(10)**

OR

Q.5 A PLL IC 565 connected for FM detection has $R_1 = 8.3K\Omega$, $C_1 = 0.001 \mu F$ and $C_C = 0.02 \mu F$. The supply voltage is +12V. Determine the: **(10)**

- i) Free running frequency.
- ii) Capture range and
- iii) Lock- range

Q.6 Sketch the circuit for 3- impact binary weighted resistor DAC and derive its output equation. **(10)**

OR

Q.6 Draw the circuit diagram and discuss the operation of V-I converter **(10)**

- i) with floating load
- ii) with grounded load