

Analog & Digital Circuit Design

Q.P. Code : 564502

(3 Hours)

(19)

[Total Marks : 80]

- N.B.**
- 1) Question No.1 is compulsory.
 - 2) Attempt any 3 questions from remaining.
 - 3) Assume suitable data wherever necessary.
1. Attempt any **four** from following: 20
 - a) Explain the working of Power MOSFET with its structure and characteristics.
 - b) Draw and explain with circuit diagram of Missing pulse detector.
 - c) Draw and explain block diagram of VCO.
 - d) What is linear voltage regulator and switching regulator?
 - e) Explain generalized impedance convertors and state a few applications.
 2.
 - a) Explain the functional block diagram of IC8038. 06
 - b) Explain the regenerative action of SCR with the help of two transistor analogy. 05
 - c) Design a 2nd order Butterworth high pass filter for $F_L = 1.2$ KHz and plot its frequency response. 05
 - d) Design a circuit using IC 555 timer to divide the input frequency by 3. 04
 3.
 - a) Explain low pass KRC filter and derive the equation for Q. 08
 - b) Draw and explain the functional block diagram of PLL in detail. Explain Lock range, Capture range and pull in time related to PLL along with its applications. 12
 4.
 - a) Explain IC 723 with its function diagram. Explain current fold back method. 05
 - b) Design a voltage regulator using IC 723 to meet the following specifications: 05
 $V_o = 9V, I_o = 100mA, V_{in} = 15 \pm 20V, I_{sc} = 150mA$ & $V_{sense} = 0.7V$
 - c) Explain working and construction of a basic stepper motor. 10
 5.
 - a) Explain IC 555 as Astable Multivibrator using functional diagram. Also derive equation for T_{on} , T_{off} , Duty cycle 12
 - b) Compare AC and DC motors. 04
 - c) Design an Instrumentation Amplifier using AD620 for gain of 800 and list its applications. 04
 6. Attempt any **four** from following:- 20
 - a) Explain working of Opto -coupler in detail
 - b) Types of analog switches.
 - c) Explain DIAC and TRIAC and explain its characteristics.
 - d) UJT as a Relaxation Oscillator.
 - e) Capacitor filters.