TE/Sem VI/ Biomed / Choice Based   15/05/19

Paper / Subject Code: 31502 / Analog and Digital Circuits Design

Duration: 3 hours **Marks : 80**

NB: 1) Q 1 is compulsory
2) Attempt any three questions out of remaining questions
3) Assume suitable data if necessary.

Q1 **Answer any four :** 20

a) Explain the modifications to get 50% duty cycle in Astable Multivibrator using IC 555.
b) Draw and explain the working of phase locked loop
c) Draw and explain monostable multivibrator using Ic 555
d) Explain the significance of increasing the order of a filter.
e) With suitable sketches explain the importance of high pass filter.

Q2a Draw and explain the basic block diagram of IC 555 covering: 10

- Block diagram
- Working of internal comparators
- Operation of flip flop
- Operation of discharge comparator

Q2b Derive for the t_{on} and t_{off} of an Astable multivibrator using IC 555 10

Q3a Derive for the transfer function of a second order high pass filter and obtain the equation for cut off frequency. 12

Q3b What is meant by 'negative resistance' in UJT .Explain the working of UJT relaxation oscillator with suitable waveforms 08

Q4a Draw block diagram and explain generalized impedance converter (GIC) 10

Q4b Explain the functional block diagram of IC 8038 10

Q5a With the help of suitable circuit explain the short circuit protection in IC 723. 10

Q5b Design a voltage regulator using IC 723 with following specifications: 10
V_o = 8V, I_o =100mA, Vin = 15 ± 20 %, V, I_{sc} = 150mA
and V sense = 0.7 V
Assume suitable data, clearly mentioning your assumption

Q6 Attempt any **four** from the following: 20
a) Hysteresis in PLL
b) Filter characteristics
c) Stepper motor
d) SCR characteristics
e) Current foldback in voltage regulators
f) All pass filter

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