Q.P. Code :25859

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question no l. Is compulsory.
2. Attempt any 3 questions from remaining.
3. Assume suitable data wherever necessary.

Q.1 Attempt any **Four** of following. **[20]**

a) Discuss Power MOSFET structure, working and characteristics with neat labeled diagrams.
b) Explain Block Diagram of VCO.
c) Explain the different types of analog switches.
d) Compare AC and DC motors. Give suitable examples for each.
e) Explain the generalized impedance convertors and give a few examples.
f) Explain block diagram of PLL and list application of PLL.

Q.2
a) Design a voltage regulator using IC 723 to meet the following specifications:- Vo= 5V,Io= 100mA, Vin=15±20V, Isc=150mA & Vsense=0.7V **[05]**
b) Explain working of UJT as a Relaxation Oscillator and derive its frequency. **[07]**
c) Explain working and construction of a basic stepper motor. **[08]**

Q.3
a) Compare Active and Passive filters. Explain low pass KRC filter and derive the equation for Q. **[10]**
b) Explain Lock range, Capture range and pull in time related to PLL. **[05]**
c) Explain missing pulse detector using timer IC 555. **[05]**

Q.4
a) Draw and explain the two transistor model of SCR. **[08]**
b) Design an Instrumentation Amplifier using AD620 for gain of 650 and explain its applications. **[06]**
c) Design a timer for Duty cycle 40% for Ton =0.8ms. Draw corresponding waveforms across output and capacitor. **[06]**

Q.5
a) Explain the functional block diagram of IC8038. **[05]**
b) Design a 2nd order Butterworth high pass filter for f=1.5 KHz and also plot its frequency response. **[05]**
c) Sketch the functional block diagram of IC555 timer and explain its working principle. Also explain use of pin number 2 and pin number 5 in detail. **[10]**

Q.6 Attempt any **Four** of following:- **[20]**

a) Explain FSK using IC 555
b) Short note on Switching Mode Power Supply
c) Short note on :Opto -Isolators and Opto -Couplers
d) Draw Symbol, structure and characteristics of DIAC and TRIAC.
e) Draw Frequency response of Butterworth, Chebyshev and Elliptical filters and compare them.

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