

(3 Hours)

Total Marks : 80

- N.B:
- (1) Q.1 is compulsory.
 - (2) Draw neat labelled diagrams and graphs wherever necessary.
 - (3) Attempt any three questions from remaining five questions.

1. Answer any four questions :

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| (a) Draw and explain the V-I characteristics of SCR. | 20 |
| (b) Differentiate between active and passive filters. | |
| (c) Explain Bistable operation using IC 555 timer. | |
| (d) Explain construction and working of a power MOSFET. | |
| (e) Explain different types of analog switches. | |
| 2. (a) Drive gain and Q factor for KRC low pass filters. | 10 |
| (b) Explain the block diagram of a VCO. | 5 |
| (c) Design a second order Butterworth High pass filter for cut off frequency 2.2 KHz. | 5 |
| 3. (a) Design Instrumentation amplifier using AD 620 for gain of 800 and explain its applications. | 10 |
| (b) Design a circuit IC 555 timer to divide the input frequency by 3 (Assume i/p frequency as 10 KHz) | 10 |
| 4. (a) Explain UTI as a relaxation oscillator. | 10 |
| (b) Explain block diagram and working of a PLL. | 10 |
| 5. (a) Design a regulator using IC 723 to meet following specifications :
$V_o = 5V$, $I_o = 50\text{ mA}$, $V_{in} = 15 \pm 20\%V$, $I_{sc} = 100\text{ mA}$ and $V_{sense} = 0.7\text{ V}$ | 10 |
| (b) Draw and explain stepper motor drive system. | 10 |
| 6. Write short notes on (any four) | 20 |
| (a) Frequency to voltage convertor | |
| (b) Opto Isolators | |
| (c) Astable multivibrator using IC 555 | |
| (d) Wide band pass filter for $f_L = 900\text{ Hz}$ and $F_H = 2.4\text{ KHz}$. | |
| (e) IC 8038 | |