

(L)

T.E- Biomed/IV/Rev/ADCD

Analog &amp; Digital Circuits design 4/6/15

Q.P. Code : 3357

(17)

(3 Hours)

[ Total Marks : 80

- N.B. : (1) Questions No. 1 is compulsory  
 (2) Attempt Any Three Questions from remaining.  
 (3) Assume suitable data wherever necessary.

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|----|---------------------------------|---|----|
| 1. | a)                              | Differentiate between active filters and passive filters.   | 5  |
|    | b)                              | Draw and explain circuit for missing pulse detector using IC 555.   | 5  |
|    | c)                              | Explain block diagram of VCO.   | 5  |
|    | d)                              | Draw and explain V-I characteristics of SCR.  | 5  |
| 2. | a)                              | Draw and explain functional block diagram of IC 555.  | 10 |
|    | b)                              | Draw a circuit diagram for 2 <sup>nd</sup> order butterworth LPF using OP-AMP. Derive expression for $V_o$ - $V_i$ , also plot frequency response.                | 10 |
| 3. | a)                              | Design Instrumentation amplifier using AD 629 for gain 300 and explain its applications.  | 10 |
|    | b)                              | Draw and explain UJT as a relaxation oscillators.   | 10 |
| 4. | a)                              | Draw and explain two transistor model of SCR.   | 10 |
|    | b)                              | Draw and explain functional block diagram of PLL. Also define lock range, capture range and pull in time related to PLL.  | 10 |
| 5. | a)                              | Design a regulator using IC 723 to meet following specifications.<br>$V_o = 6V$ , $I_o = 100mA$ , $V_{in} = 15 \pm 20\%$<br>$I_{sc} = 150mA$ & $V_{sense} = 0.7V$ | 10 |
|    | b)                              | Draw and explain stepper motor drive system.  | 10 |
| 6. | Write short notes on (Any Four) |   | 20 |
|    | a)                              | Frequency to voltage convertor  |    |
|    | b)                              | FSK Generate  |    |
|    | c)                              | Pulse width modulator using IC 555  |    |
|    | d)                              | Opto isolators  |    |
|    | e)                              | Explain servomechanism  |    |

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