

**NB:**

- 1) Question No. ONE is compulsory.
- 2) Out of remaining questions, attempt any THREE questions.
- 3) In all FOUR questions to be attempted.
- 4) All questions carry equal marks.
- 5) Answer to each new question to be started on a fresh page.
- 6) Figures in brackets on the right hand side indicate full marks.
- 7) Assume Suitable data if necessary

**Q1. Attempt any four****(20 marks)**

- a) State and explain relation between DTFS, DFT and ZT
- b) Explain the need of DSP processor.
- c) Differentiate between Butterworth and Chebyshev filters.
- d) Explain frequency wrapping effect in designing IIR filter.
- e) Compare DSP processor and microprocessor.

**Q2. a) Explain Gibbs Phenomenon and state its significance in FIR filter design.****(10 marks)****b) Explain different addressing modes of TMS 320C67XX DSP processor.****(10 marks)****Q3. a) What are the salient features of TMS 32067C67XX family of DSP processors.****(10 marks)****b) Compute the circular convolution of the sequence using DFT and IDFT,  $x_1(n) = \{1, 2, 0\}$  and  $x_2(n) = \{2, 2, 1, 1\}$** **(10 marks)****Q4. a) Compute IDFT of the following sequence using inverse FFT algorithm  $X(k) = \{3, 0, 3, 0, 3, 0, 3, 0\}$** **(10 marks)****b) Explain VLIW architecture in details****(10 marks)****Q5. a) Design Butterworth LPF to meet following specifications.**

Passband gain is 0.89

Passband frequency edge 30Hz

Attenuation 0.20

Stopband edge 75Hz

**(10 marks)****b) Design analog Butterworth filter that has -2 dB passband attenuation of 20 rad/sec and at least -10 dB stopband attenuation at 30 rad/sec.****(10 marks)****Q6. Write short note on following (Any two)****(20 marks)**

- a) Frequency transformation in IIR filter
- b) Application of DSP in speech and Radar processing
- c) Limit cycle Oscillations