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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **IN354UA - Digital Signal Processing Professional Elective- II**

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Maximum Marks : **60**   Duration : **3 Hrs**

Edit   Print   View Answer Key   Close   **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. *All questions are compulsory.*
2. *Illustrate your answer with suitable figures/sketches wherever necessary.*
3. *Assume suitable additional data; if required.*
4. *Use of logarithmic table, drawing instruments and non programmable calculators is allowed.*
5. *Figures to the right indicate full marks.*

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1)   solve any three sub question

a) Explain sampling Theorem in Time domain   [6]

b) Explain basic elements of DSP . state advantages of digital signal processing over analog processing.   [6]

c) Explain four different properties the DFT   [6]

d) For the following signals, determine and sketch convolution y(n)   [6]
   Graphically.

$$x(n)= n/3 \qquad 0 \leq n \leq 6$$
$$\quad = 0 \qquad\qquad \text{Otherwise}$$
$$h(n) = 1 \qquad\qquad -2 \leq n \leq 2$$
$$\quad = 0 \qquad\qquad \text{Otherwise}$$

2)   solve any three sub question

a) compute the convolution of y(n) by analytical method   [6]

   $$x(n) \;=\; \{1, 1, 0, 1, \;1, \}$$
   $$\qquad\qquad\qquad\uparrow$$
   $$y(n) \;=\; \{1, -2\; -3, 4, \}$$
   $$\qquad\qquad\qquad\uparrow$$

b) Derive the DFT of the sample data sequence x(n)={1,1,2,2,3,3}   [6]

c) find the circular convolution using the DFT and IDFT   [6]
   X1 = {1,1,2,2}   X2 = {1, 2, 3,4 }

d) Explain four different properties of Z Transform   [6]

3)   solve any two sub question

a) Explain window technique   [6]

b) Explain IIR filter design by impulse invariance method   [6]

c) Explain features of TMS320C67XX   [6]

4)   solve all sub question

a) Given x(n) = { 1 2 3 4 4 3 2 1} find X(k) using DIT FFT algorithm   [6]

b) Explain application of DSP In Radar Processing.   [6]

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