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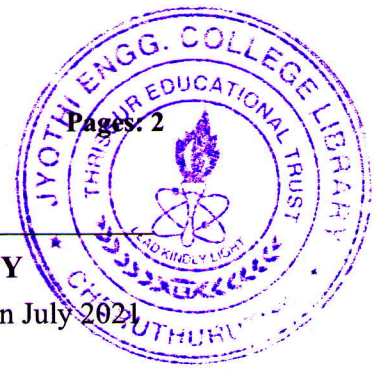
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Reg No.: _____

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Regular and Supplementary Examination July 2021



Course Code: MR362

Course Name: DIGITAL SIGNAL PROCESSING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

- 1 Determine the convolution sum of two sequences (5)
 $X(n)=\{1,0,2,5,4\}$ and $h(n)=\{1,-1,1,-1\}$
- 2 Define periodic and non-periodic signals. (5)
- 3 List out any four properties of DFT in detail. (5)
- 4 Write the steps to design an analog Butterworth lowpass filter. (5)
- 5 What are the desirable characteristics of the windows? (5)
- 6 Compare IIR and FIR filters. (5)
- 7 What is meant by pipeline technique? List out the advantages. (5)
- 8 Compare fixed point and floating point arithmetic. (5)

PART B

Answer any three questions, each carries 10 marks.

- 9 a) Write the Properties of convolution? (3)
b) Determine the if the following systems are time invariant or time variant (7)
(i) $Y(n)=x(-n)$; (ii) $y(n)=x(n)+x(n-1)$
- 10 Define Energy and Power Signals. Determine whether the following signals are (10)
energy or power signals.
(i) $X(n)=\sin(\pi/3)n$ (ii) $x(n)=u(n)$
- 11 Define Z-transform? Explain any five properties of Z-Transform. (10)
- 12 Apply Bilinear transformation to $H(s)=2/(s+1)(s+2)$ with $T=1\text{sec}$ and find (10)
 $H(z)$.
- 13 Compute the DFT of the sequence whose values one period is given by (10)
 $x(n)=\{1,1,-2,-2\}$

PART C

Answer any two questions, each carries 15 marks.

- 14 Explain the different types of windowing techniques. (15)
- 15 Design an ideal high pass filter with a frequency response given below, for $N=11$. Find realizable filter transfer function using rectangular window. (15)

$$H_d(e^{j\omega})=1, \text{ for } (\pi/4) \leq |\omega| \leq \pi$$

$$0, \text{ for } |\omega| \leq (\pi/4)$$

- 16 What are the different buses of TMS320C5X Processor and list their functions. (15)
- 17 Discuss about the addressing modes used in TMS320C5X Processor. (15)
