EVENING

[Total No. of Questions: 09]

Uni. Roll No. ...............

15 JUN 2023

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018 onward)
Semester: 5th
Name of Subject: Digital Signal Processing
Subject Code: PCEC-111
Paper ID: 16418
Scientific calculator is allowed

**Time Allowed: 03 Hours**

**Max. Marks: 60**

**NOTE:**

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

<div align="center">

**Part – A**

</div>

**[Marks: 02 each]**

**Q1.**

a) Differentiate between general and special purpose digital signal processors

b) List any two applications of digital signal processing

c) Compare direct form and cascade form structures of FIR filters.

d) Discuss the condition for stability and causality in Z- domain.

e) Draw the block diagram of ADSP 2100 processor.

f) A result of circular and linear convolution is not same. Justify the statement using suitable example.

<div align="center">

**Part – B**

</div>

**[Marks: 04 each]**

**Q2.** Compare the performance of FIR and IIR filters

**Q3.** Discuss any four properties of z-transform in DSP using examples.

**Q4.** Differentiate between Fourier transform and Discrete Fourier transform.

**Q5.** With the help of N=8, explain radix-2 DIT FFT Algorithm for computation of DFT.

**Q6.** Calculate the inverse Z-transform of the following

$$X(Z) = \frac{Z^{-1}}{(1-3Z^{-1})}, ROC: |Z| < 3$$

**Q7.** Analyse the various finite-word length effects while designing FIR filters.

Part – C     15 JUN 2023     [Marks: 12 each]

**Q8.** Discuss any four properties of LTI system with two examples of each.

OR

Describe the basic elements of digital signal processing system with block diagram. Discuss the advantages and disadvantages of digital signal processing over analog processing.

**Q9.** Determine H(Z) using impulse invariance method at 5 Hz sampling frequency from H(s) as given below

$$H(s) = \frac{2}{(s + 1)(s + 2)}$$

OR

Draw and explain the architecture of TMS320C50 digital processor.

\*\*\*\*\*\*\*\*\*\*\*\*