HB-003-0498003

B. Sc. / M. Sc. (Applied Physics) (Sem. VIII)
(CBCS) Examination

April - 2023

Signal Processing & Communication : Paper - VII

(New Course)

Faculty Code : 003
Subject Code : 0498003

Time : $2\frac{1}{2}$ Hours / Total Marks : **70**

Instructions : (1) All questions are compulsory.
(2) Numbers in the right margin indicate marks.

1 Attempt any SEVEN short questions : (Two marks each) **14**
(1) What is the need for signal processing?
(2) Analog Modulation is better than digital modulation for sound - (True / False) - Justify
(3) Define Aperiodic Signal.
(4) What is system?
(5) Causal System is always static. True / False? - Justify
(6) What is TDMA?
(7) Discuss any two properties of LTI system
(8) Write and briefly explain communication modes.
(9) Write the use of Oscillator in any electronic circuit.
(10) Why modulation is required?

2 Write the answer of any TWO questions: **14**
(1) Explain different types of signals for digital signal processing.
(2) With neat sketch, explain standard test signals.
(3) Plot following signals:

(a) $x[n] = u[n-2] + u[n+1]$

(b) $x[n] = u[3-n] - u[n]$

(4) Explain FDM and TDM.

3 Write the answer of any TWO questions: **14**

(1) Explain different types of systems with proper example.

(2) Identify the types of systems:

$$y[n] = |X[n]| \text{ and } y[n] = n + x[n]$$

(3) What is meant by correlation? Find Correlation of

$$x[n] = \{4, 3, 2\} \text{ and } \{5, 4, 3\}.$$

(4) Explain different operations on signal.

4 Write the answer of any TWO questions :   **14**

(1) Write in detail about the applications of Digital Signal Processing.

(2) What is impulse response of a system? What is the use of finding an impulse response?

(3) Find the linear convolution of

$$X[n] = \{3, 0, 2, 4, 5\}$$

$$Y[n] = \{1, 2, 1, -3\} \text{ using tabular method.}$$

(4) Find Linear convolution of {1,2,3} and {2,3,1} using mathematical formula method.

5 Write the answer of any TWO questions: **14**

(1) Explain amplitude modulation in detail.

(2) Explain frequency modulation in detail.

(3) What is meant by (a) Mixer (b) VCO

(4) Why PLL are used? Also explain frequency synthesiser in detail.

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