



BBM-0030498003

Seat No. _____

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

July - 2021

**Paper - VII : Signal Processing & Communication
Core - 7
(New Course)**

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Attempt any five questions.
(2) Numbers in the right margin indicate marks.

- 1** Attempt following short questions : (two marks each) **14**
- (1) What is the need of signal processing.
 - (2) Give four examples of signal processing technology in today's world.
 - (3) Define Signal.
 - (4) Define Modulation.
 - (5) What is Modulation Index ?
 - (6) What care must be taken for successful communication ?
 - (7) What is the unit of information ?
- 2** Attempt following short questions : (two marks each) **14**
- (1) What is meant by Impulse response of any system ?
 - (2) Bandwidth is considered as most precious element for any electronic communication. Why ?
 - (3) What is SSB ?
 - (4) Is DSB better than SSB ?
 - (5) Define System.
 - (6) Static system can be causal - True / False ? Justify your answer.
 - (7) List any four applications of signal processing.
- 3** Do as directed : **14**
- (1) What is meant by correlation ? Explain in detail.
 - (2) Explain Linear Convolution.

- 4 Do as directed : 14
 (1) What is LTI ? List properties of LTI.
 (2) With clear examples, explain different operations on signals.
- 5 Do as directed : 14
 Check following systems (All types of systems)
 (1) Given $y(n) = c(|n|)$ and $y(n) = nx(n-3)$
 (2) Given $y(n) = x(n+2) - 3x(n)$ and $y(n) = e^{x(n)}$.
- 6 Do as directed : 14
 (1) Explain following for electronic communication system. Mainly why and where they are used...
 (1) Oscillators
 (2) Phase Locked Loops
 (2) Which are different transmission modes ?
- 7 Do as directed : 14
 (1) Explain Standard Test Signals used for experiments with neat sketch.
 (2) Explain how Systems are classified.
- 8 Do as directed : 14
 (1) Plot
 (i) $\delta(3n)$
 (ii) $u(-2-n)$
 (2) Explain Frequency Modulation in detail.
- 9 Do as directed : 14
 (1) Discuss Amplitude Modulation and Demodulation.
 (2) What is meant by overmodulated, undermodulated and perfectly modulated waveforms ? Explain with neat sketch.
- 10 Do as directed : 14
 Find convolution of following by two different methods :
 (any two methods)
 (1) $\{1, \underline{4}, 1, 2\}$ and $\{1, 0, \underline{-2}, 1\}$
 (2) $\{1, 2, \underline{1}, 2\}$ and $\{\underline{-1}, 1, -1, 1\}$