



- N.B. 1. Question No. 1 is compulsory
2. Attempt any **three** out of remaining
3. Assume suitable data if **necessary** and justify the assumptions
4. Figures to the **right** indicate full marks

- Q1 A Perform convolution operation between given function in time domain if 05
 $x_1(n) = (-3)^n$ for $n = 0, 1, 2, 3$
 $= 0$ otherwise and
 $x_2(n) = u(n) - u(n-4)$
- B Find whether the given signal is energy signal or not $x(n) = u(n) - u(n-6)$ 05
- C State the stability criteria of discrete time system and determine the given IIR 05
system is stable or not $y(n) = 5x(n) + 12$.
- D Find IDFT of $X(k) = \{2, 1-j, 0, 1+j\}$. 05
- Q2 A Consider the following analog signal 10
 $x(t) = 2\sin(100 * \Pi * t)$
The signal $x(t)$ is sampled with a sampling rate $F_s = 50\text{Hz}$. Determine the discrete time signal. Plot the discrete time signal. And also calculate total number of samples.
- B If $x_1(n) = \{1, 2, 3, 6\}$ find $X_1(K)$ and $p(n) = \{1, 6, 3, 2\}$ Find $P(K)$ using $X_1(K)$. 10
- Q3 A Check whether following systems are : 10
i) Static or Dynamic ii) Linear or Non-linear
iii) Shift invariant or variant iv) Causal or Non-causal.
a) $y(n) = 2^n u(n)$ b) $y(n) = 4x(n) + x(n-2)$
- B For $x(n) = \{8, 5, 2, 4, 2, 1\}$, plot the following Discrete Time signals: 10
1.) $x(n+2)$ 2.) $x(n)u(-n)$ 3.) $x(n-1)u(-n-2)$
4.) $x(-n-1)u(n)$ 5.) $x(2n-1)$
- Q4 A State any five DFT properties. 10
- B Draw the radix 2 DIT FFT and find the DFT of the sequence 10
 $x(n) = \{2, 3, 4, 1, 0, 0, 0, 0\}$ using FFT flow graph.

[TURN OVER]

- Q5 A Compute Linear Convolution of causal sequence $x(n) = \{5, 6, 2, 4, 1, 4, 5, 2, 3\}$ 10
and $h(n) = \{2, 1, 3, 1\}$ using fast overlap add method.
- B For the FIR digital filter with impulse response given by 10
 $h(n) = \delta(n) + 2\delta(n-2) + 3\delta(n-3)$ sketch the magnitude response of the filter.
- Q6 A Write a detailed note on TMS 320. 10
- B Write a detailed note on Carls' Correlation Coefficient Algorithm. 10
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Course: B.E. (Sem VII) (CBSGS&OLD) (All Branch)

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Correction:

Q1 A Read as "Perform linear convolution....."

Instead of

Q1 A "Perform convolution....."

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