

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2023

B.Tech-V Semester (ECE)

COURSE CODE (CREDITS): 18B11EC511 (04)

MAX. MARKS: 25

COURSE NAME: Principles of Digital Signal Processing

COURSE INSTRUCTORS: Dr. Sunil Datt Sharma

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.1 Find the output of a digital filter for the input $x(n) = \{3, 3, 3, 1, 1, 1, 2, 2, 2, 2\}$, if impulse response of a filter is $h(n) = \{1, 1, 1\}$. (using overlap, save method). [Marks-05, CO-2]

Q2. Compute and draw the structure of the 4-point DFT of a sequence $x(n) = \{1, 1, 1, 1\}$ using radix-2 DIT FFT algorithm. [Marks-05, CO-2]

Q3. Compute and draw the structure of the 4-point DFT of a sequence $x(n) = \{1, 2, 3\}$ using radix-2 DIF FFT algorithm. [Marks-05, CO-2]

Q4. Draw structure (direct form, II) of the second order filter $H(z) = \frac{1 - b \cos \omega_0 z^{-1}}{1 - 2b \cos \omega_0 z^{-1} + b^2 z^{-2}}$

[Marks-05, CO-3]

Q5. Write in brief about the following-

[Marks-05, CO-1]

(a) Convolution

(b) Correlation

(c) Impulse response

(d) Steps for analog signal to digital signal conversion