Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted the assignment.

Due on 2020-10-26, 20:19 IST.

Given \( X(z) = \frac{1}{1-z^{-1}}, \mid z \mid < \mid a \mid \); then the corresponding time domain sequence \( x(n) \) is given by

(a) \(- (n - 1) a^{n-1} u(n - 1)\)
(b) \(- n a^n u(n - 1)\)
(c) \(- (n - 1) a^{n-2} u(n)\)
(d) \(- n a^n u(n)\)

No, the answer is incorrect.

Accurate Answers:

(c) \(- (n - 1) a^{n-2} u(n)\)

2) 1 point

If \( x(n) \leftrightarrow X(z), \frac{1}{2} < \mid z \mid < 2 \); then the z-transform of \( x(-n) \) is given by

(a) \( X\left(\frac{1}{z}\right), \mid z \mid < 2\)
(b) \( X^*(z), \mid z \mid > \frac{1}{2}\)
(c) \( X^*\left(\frac{1}{z}\right), \mid z \mid > 2 \text{ and } \mid z \mid < \frac{1}{2}\)
(d) \( X\left(\frac{1}{z}\right), \frac{1}{2} < \mid z \mid < 2\)

No, the answer is incorrect.

Accurate Answers:

(d) \( X\left(\frac{1}{z}\right), \frac{1}{2} < \mid z \mid < 2\)

3) 1 point

Given a 4-point sequence \( x(n) = \{1, 0, 0, -1\} \) with \( X(k), k = 0, 1, 2, 3 \) denoting its 4-point DFT, we evaluate \( y(n) = 4 \text{ point IDFT of } e^{j\pi n} X(k) \). Then \( y(n) \) is given by

(a) \( \{1, 0, -1, 0\}\)
(b) \( \{0, -1, 1, 0\}\)
(c) \( \{0, -1, 1, 0\}\)
(d) \( \{-1, 0, 0, 1\}\)

No, the answer is incorrect.

Accurate Answers:

(c) \( \{0, -1, 1, 0\}\)

5) 1 point

Given a \( N \)-point sequence \( x(n) \), define a new sequence \( y(n) = x^*(n) \). If \( X(k) \) and \( Y(k) \) denote the \( N \)-point DFTs of \( x(n) \) and \( y(n) \) respectively, then

(a) \( Y(k) = X^*(N-k), k = 1, 2, \ldots, N-1 \text{ and } Y(0) = X^*(0)\)
(b) \( Y(k) = X^*(k), k = 1, 2, \ldots, N-1 \text{ and } Y(0) = X^*(0)\)
(c) \( Y(k) = X(N-k), k = 1, 2, \ldots, N-1 \text{ and } Y(0) = X(0)\)
(d) \( Y(k) = X^*(k), k = 1, 2, \ldots, N-1 \text{ and } Y(0) = X(0)\)

No, the answer is incorrect.

Accurate Answers:

(a) \( Y(k) = X^*(N-k), k = 1, 2, \ldots, N-1 \text{ and } Y(0) = X^*(0)\)

7) 1 point

Given a 5-point sequence \( x(n) = \{1, -1, 1, 0, 0\} \) with \( X(k), k = 0, 1, 2, 3, 4 \) denoting its 5-point DFT, we evaluate \( y(n) = 5 \text{ point IDFT of } X^2(k) \). Then \( y(n) \) is given by

(a) \( \{1, 2, -3, 2, 1\}\)
(b) \( \{1, -2, -3, -2, 1\}\)
(c) \( \{-1, 2, 3, -2, 1\}\)
(d) \( \{-1, 2, -2, -2, 1\}\)

No, the answer is incorrect.

Accurate Answers:

(c) \( \{-1, 2, 3, -2, 1\}\)