

[Dashboard](#) / [Courses](#) / [SoEN](#) / [CCE](#) / [ENGG515\(Tripoli-A-245726\) Fall 2024 - 2025](#) / [General](#) / [ENGG515-Assessment- Fall 2024-2025](#)

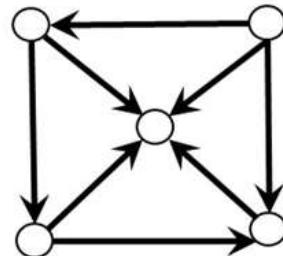
Question 1

Answer saved

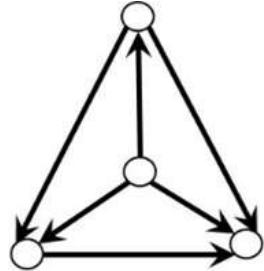
Which of the following is not an acyclic directed graph?

Select one:

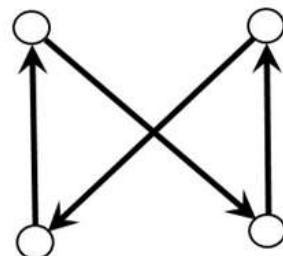
a.



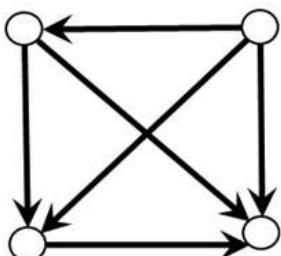
b.



c.



d.

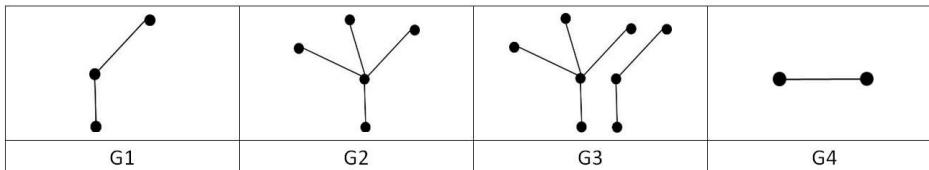


[Clear my choice](#)

Question 2

Answer saved

Which of the following graphs is not a tree?



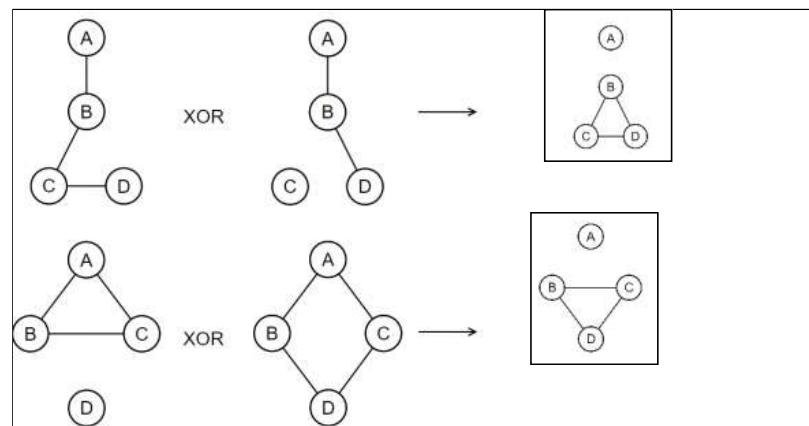
Select one:

- a. G1
- b. G2
- c. G3
- d. G4

[Clear my choice](#)**Question 3**

Answer saved

Complete the XOR operation



Question 4

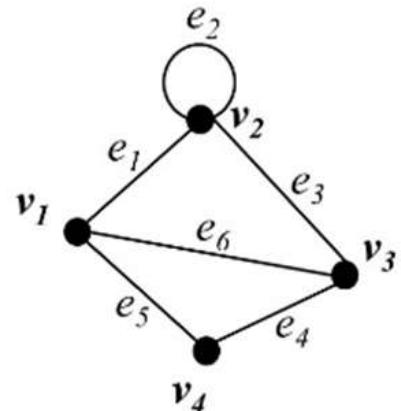
Answer saved

Which graph is represented by the following incidence matrix?

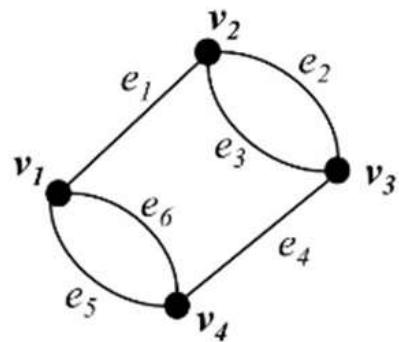
	e_1	e_2	e_3	e_4	e_5	e_6
v_1	1	0	0	0	1	1
v_2	1	1	1	0	0	0
v_3	0	0	1	1	0	0
v_4	0	0	0	1	1	1

Select one:

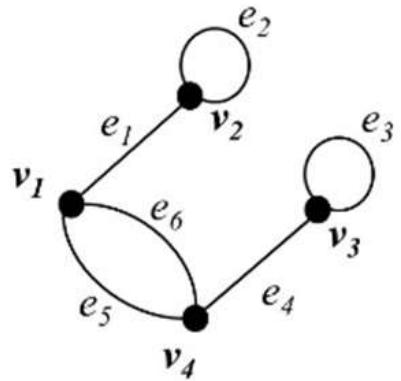
a.



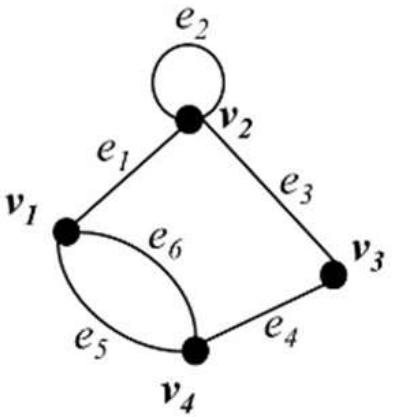
b.



○ c.



◎ d.

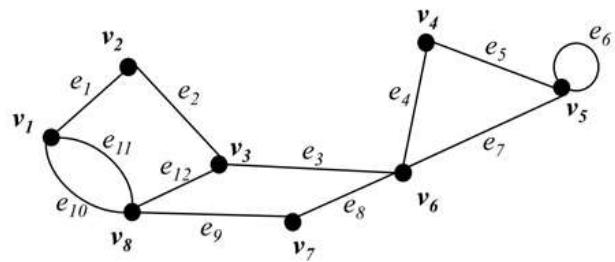


[Clear my choice](#)

Question 5

Answer saved

Label each of the following sequences with "Trail" or "Not a trail" based on the provided graph.



v4, e5, v5, e7, v6, e4, v4 : Trail

v1, e1, v2, e2, v3, e12, v8, e11, v1: Trail

v3, e3, v6, e3, v3 : Not a trail

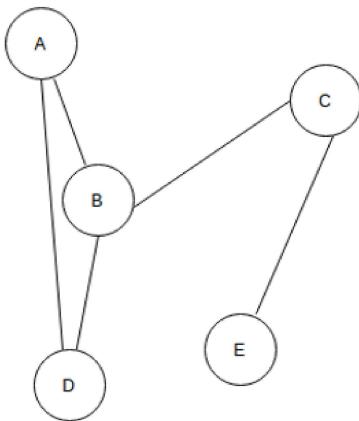
v1, e11, v8, e12, v3, e2, v2, e1, v1, e10, v8: Trail

Trail Not a trail

Question **6**

Answer saved

In the given graph identify the cut vertices



Select one:

- a. C and B
- b. C and D
- c. B and E
- d. A and E

[Clear my choice](#)

Question **7**

Answer saved

Flipping the ones and zeros in the incidence matrix of any simple graph will result in the incidence matrix of its complement.

Select one:

- a. True
- b. False

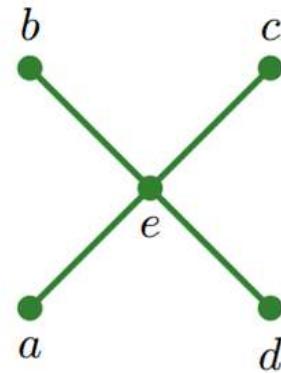
Question 8

Answer saved

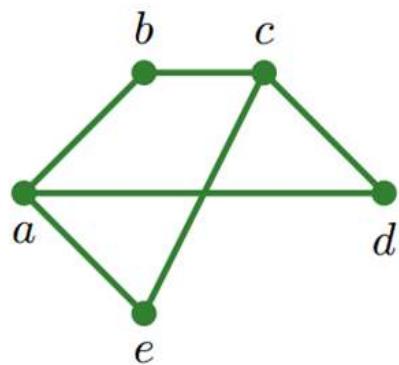
Select the bipartite graphs among the following:

Select one or more:

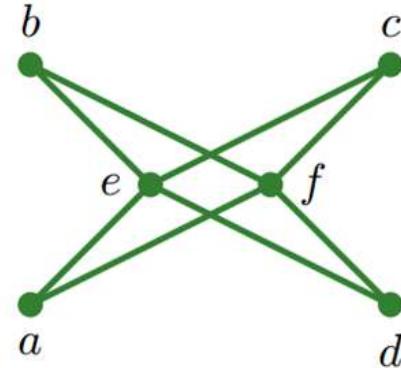
a.



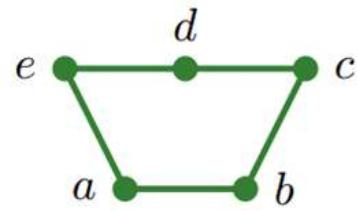
b.



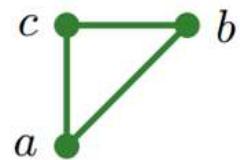
c.



□ d.



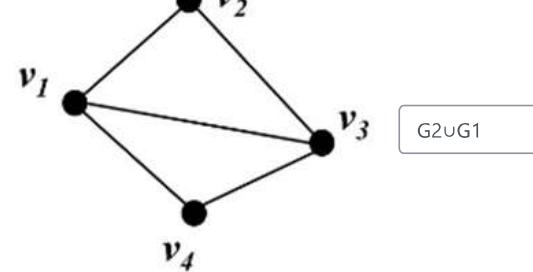
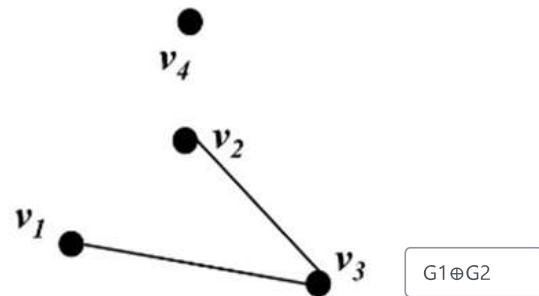
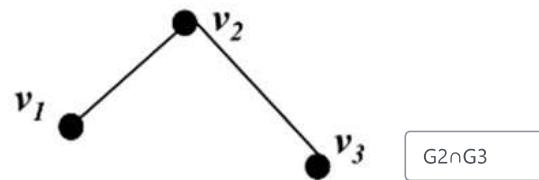
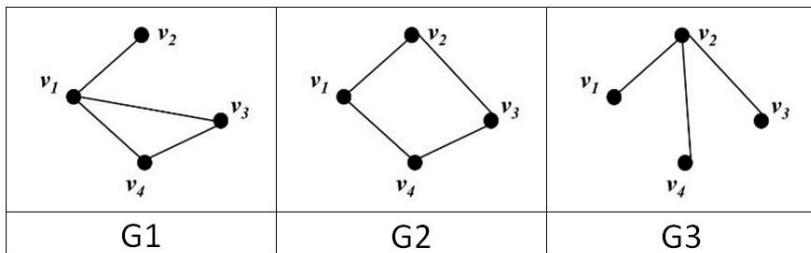
□ e.

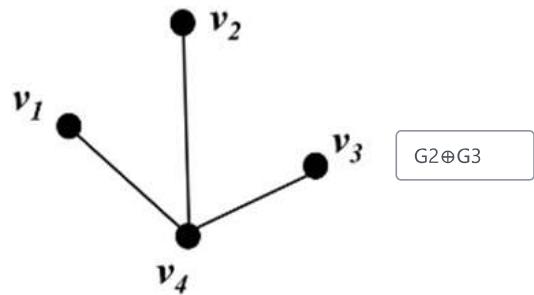


Question 9

Answer saved

Using graphs F, G, and H, match each of the following operations with the corresponding graph.

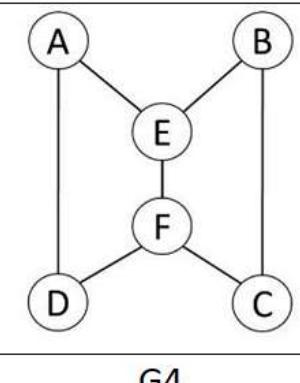
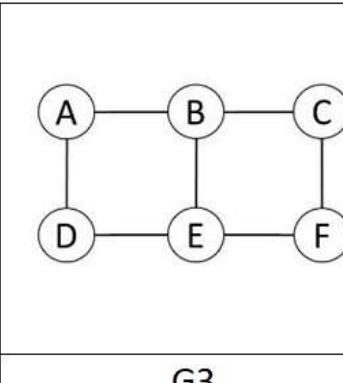
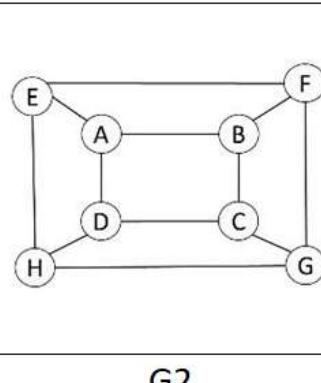
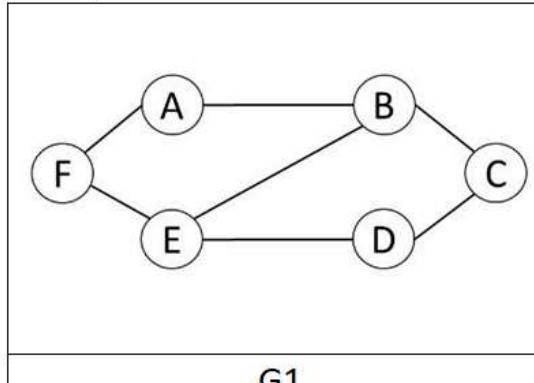




Question 10

Answer saved

Which of the following graphs is not bipartite?



Select one:

- a. All of them are bipartite
- b. G1
- c. G2
- d. G3
- e. G4
- f. None of them is bipartite

[Clear my choice](#)

Question 11

Not yet
answered

Eight people are going on a road trip and must divide the group into different vehicles so that

- Ali is not in the same car with Fadi.
- Elie is not in the same car with Sarah.
- Fadi is not in the same car with Nadine.
- Elie is not in the same car with Farid.
- Nadine is not in the same car with Hala.
- Sarah is not in the same car with George.
- Ali is not in the same car with Farid.
- Fadi is not in the same car with George.
- Ali is not in the same car with Hala.
- Sarah is not in the same car with Hala.
- Nadine is not in the same car with Farid.
- George is not in the same car with Hala.

How many vehicles are needed?

Select one:

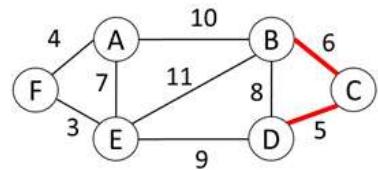
- a. 3
- b. 2
- c. 4
- d. 5
- e. 6

[Clear my choice](#)

Question **12**

Answer saved

The edges highlighted in red are the ones that have been selected so far using Prim's algorithm to find the minimum spanning tree. Which edge should be selected next?



Select one:

- a. BD
- b. DE
- c. AE
- d. EF
- e. AF

[Clear my choice](#)

Question **13**

Answer saved

Consider a graph $G(V, E)$ with $V=\{1,2,3,4\}$ and $E=\{a,b,c,d,e,f\}$ having the following incident matrix

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1	1	1	1	0	0	0
2	1	1	0	1	0	0
3	0	0	0	1	1	1
4	0	0	1	0	1	1

It has a weight on his edges given by:

Weight on *a* is 3, on *b* is 2, on *c* is 1, on *d* is 2, on *e* is 4 and on *f* is 2.

How many minimum spanning trees does this graph have?

Select one:

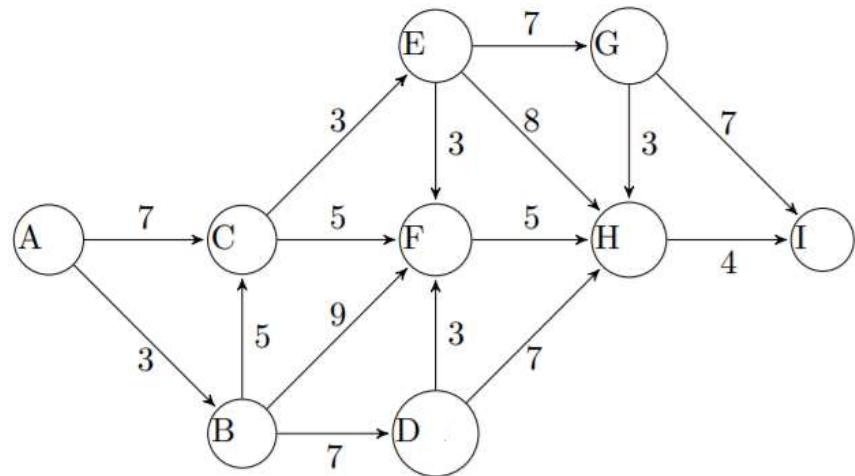
- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

[Clear my choice](#)

Question **14**

Answer saved

Consider the following directed graph. How many shortest path from A to I?



Select one:

- a. 3
- b. 2
- c. 1
- d. 4

[Clear my choice](#)

Question **15**

Not yet
answered

Consider a complete undirected graph G with 4 vertices. The weight of edge $\{x,y\}$ is given in the below matrix as W_{xy} . What is the largest possible value of X , if the edge weighted X is to be included in at least one shortest path between some pair of vertices

$$W = \begin{matrix} & \begin{matrix} a & b & c & d \end{matrix} \\ \begin{matrix} a \\ b \\ c \\ d \end{matrix} & \begin{pmatrix} 0 & 2 & 8 & 5 \\ 2 & 0 & 5 & 8 \\ 8 & 5 & 0 & X \\ 5 & 8 & X & 0 \end{pmatrix} \end{matrix}$$

Select one:

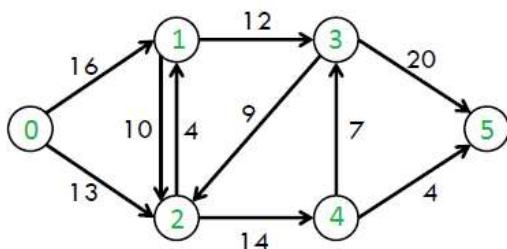
- a. 8
- b. 10
- c. 11
- d. 12

[Clear my choice](#)

Question 16

Not yet
answered

Given the following network with capacities on arcs, identify a min-cut in the network when sending flow from 0 to 5



Select one:

- a. (1,2) (3,2) (2,4)
- b. (1,3) (3,2) (4,3) (4,5)
- c. (3,5) (4,5)
- d. (0,1) (0, 2)

[Clear my choice](#)

Question 17

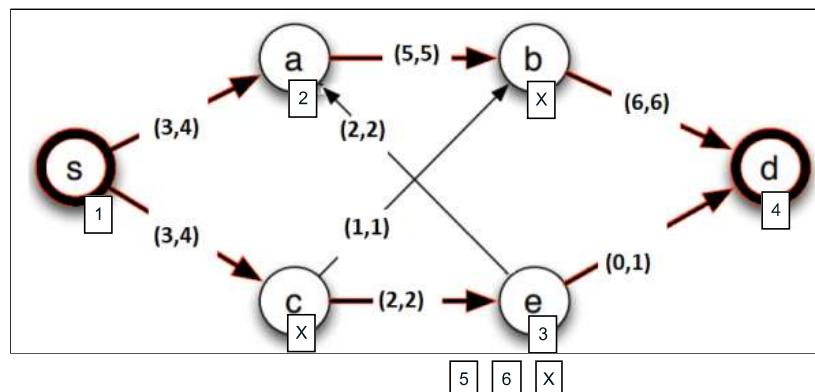
Answer saved

Consider the following max flow problem. The tuple (f, c) on each edge indicates the flow f on the edge and its capacity c .

You are asked to identify an augmenting path from s to d

Label the nodes in ascending order along the augmenting path starting from 1 on s . Use as much labels as you need. Label with X nodes that are not visited by the augmenting path.

Note: You might need to build the residual network to see the augmenting path.



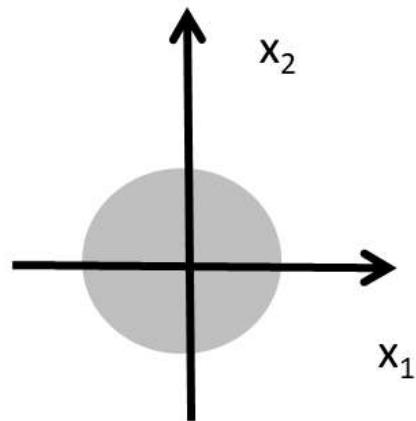
Question **18**

Answer saved

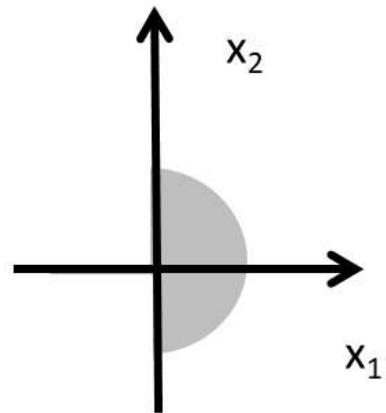
Assuming $\Omega = \{(x_1, x_2) \in R^2, x_1 \geq 0\}$, which of the following is a neighborhood of (0,0)?

Select one:

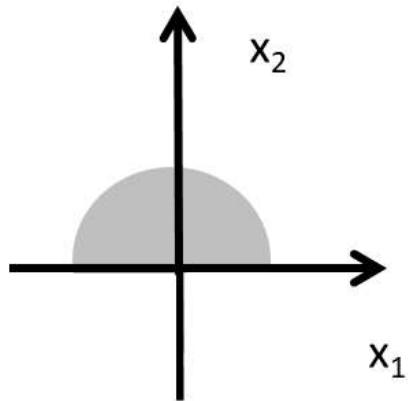
a.



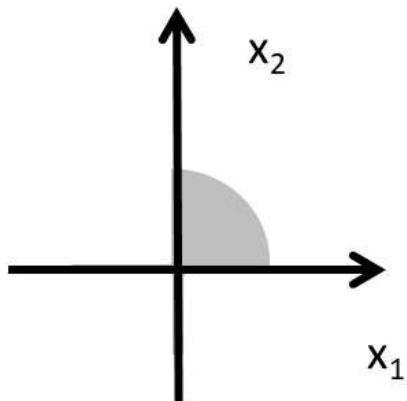
b.



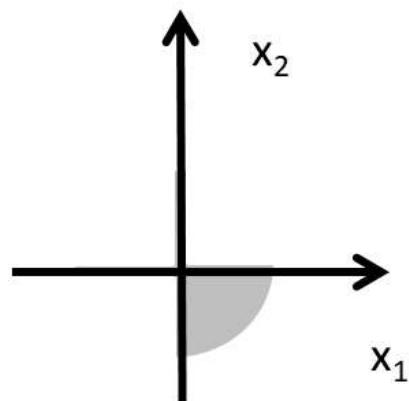
c.



d.



e.



[Clear my choice](#)

Question 19

Answer saved

For each of the following feasible domains, indicate whether it has boundary points only, interior points only, or both.

$\Omega = \{(x_1, x_2) \in R^2, x_1 > 0\}$:

$\Omega = \{(x_1, x_2) \in R^2, x_1 = x_2\}$:

$\Omega = \{x \in R, 1 \leq x \leq 2\}$:

$\Omega = \{(x_1, x_2) \in R^2, (x_1)^2 + (x_2)^2 = 1\}$:

Question 20

Answer saved

Given $f(x, y) = -x^2 - y^4 + 3$ and starting at point (1,-1), indicate for each of the following directions whether f would increase or decrease.

(0,1):

(1,0):

(0,-1):

(-1,0):

Question 21

Answer saved

Starting from **x=1** Perform **one iteration** of the Newton method to find the maximum of

$$f(x) = \ln(2 * x + 1) - x^2$$

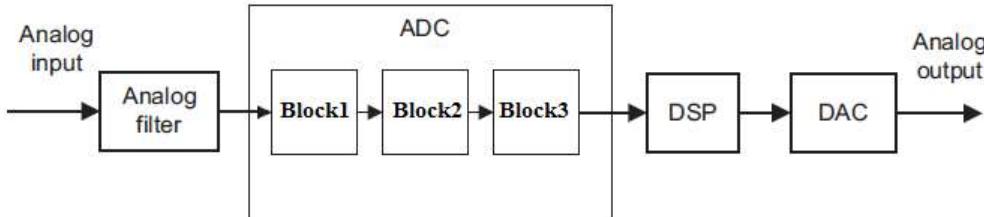
Select one:

 a. 0.45 b. 0.5 c. 0.49 d. 0.7[Clear my choice](#)[◀ Announcements](#)

Question 1

Not yet answered

The block diagram below shows the complete digital processing chain where some block are undefined:



Explain the role of the Analog filter block.

Select one:

- a. It converts continuous-time signal into discrete-time signal.
- b. It converts continuous valued signal into discrete-valued signal.
- c. It is an anti-aliasing filter that aims to ensure that Fmax does not exceed a predetermined value.
- d. It converts the processed digital signal to an analog output signal.

[Clear my choice](#)

Question 2

Not yet answered

The following discrete-time signal is:

$$x[n] = \cos(2\pi n/3) - \cos(4\pi n/7).$$

Check its periodicity and give the period if any.

Select one:

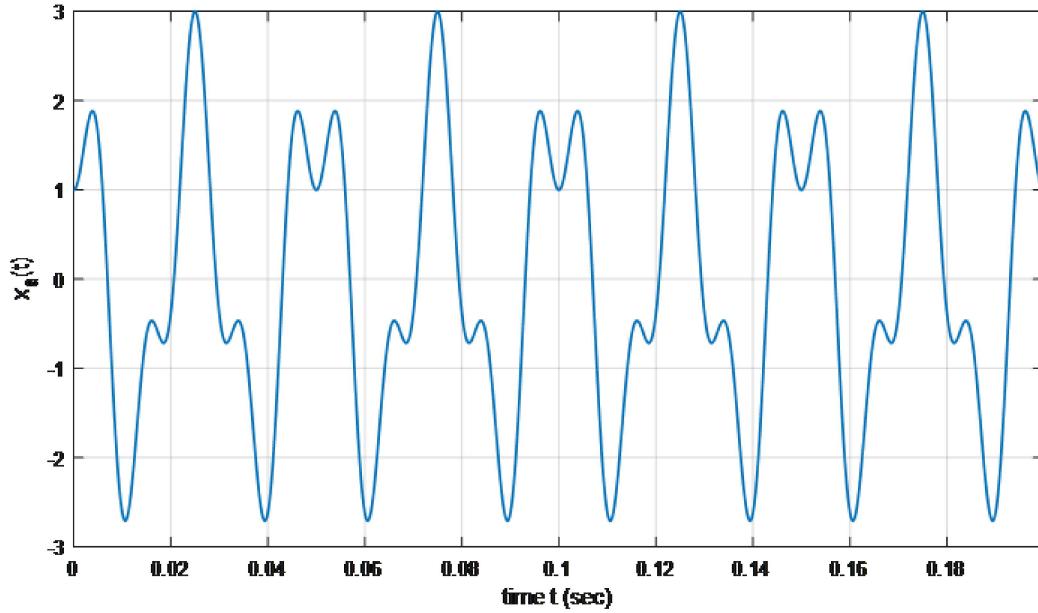
- a. periodic with period N=7 samples
- b. not periodic
- c. periodic with period N=3 samples
- d. periodic with period N=21 samples

[Clear my choice](#)

Question 3

Not yet answered

Determine the period (in seconds) of the signal $x_a(t)$ in the figure below.



Answer:

Question 4

Not yet answered

Consider the following discrete-time signal $x(n) = \cos(\pi n + \pi/2) + 2\sin(0.25\pi n) - \cos(0.5\pi n)$. Determine the period of $x(n)$.

Answer:

Question 5

Not yet answered

The analog signal $x_a(t) = \cos(90\pi t) - 3\sin(50\pi t) - \cos(30\pi t + \pi/3)$ is sampled with a sampling frequency $F_s = 80\text{Hz}$. Choose the correct statement(s).

Select one or more:

- a. The frequency $F = 45\text{Hz}$ is affected by aliasing.
- b. There is aliasing.
- c. There is no aliasing.
- d. Both frequencies $F = 45\text{Hz}$ and $F = 25\text{Hz}$ are affected by aliasing.

Question 6

Not yet answered

A continuous-time signal $x(t)$ has a bandwidth of $F = 10\text{ kHz}$ and it is sampled at $F_s = 22\text{ kHz}$, then quantized with a quantization step of 1.1 Volt . The signal is properly scaled so that $-128 < x[n] < 128$ for all n .

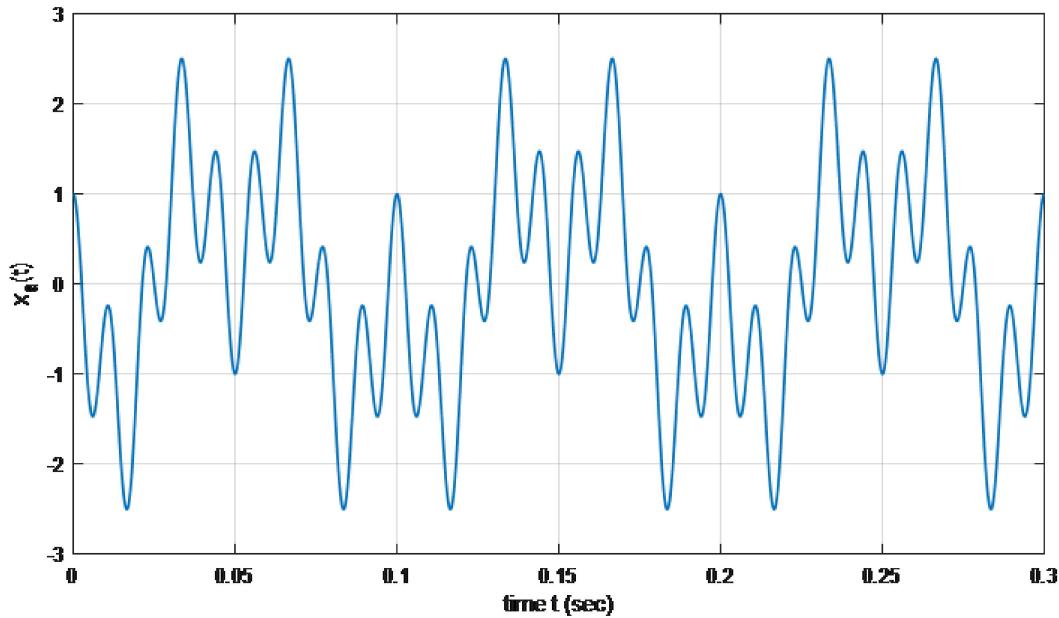
In this case, the required data rate (in Kbits/sec) should be:

Answer:

Question 7

Not yet answered

The signal in the figure below is passed into an analog-to-digital converter (ADC). The ADC is operating at $4.5Kbps$ with a resolution $\Delta = 0.01$. Determine the sampling frequency (in Hz).



Answer:

Question 8

Not yet answered

Consider the analog signal $x_a(t) = \cos(180\pi t) + \cos(60\pi t) - \cos(20\pi t)$. Determine the discrete time signal $x(n)$ if the signal is sampled at $F_s = 100Hz$.

Select one:

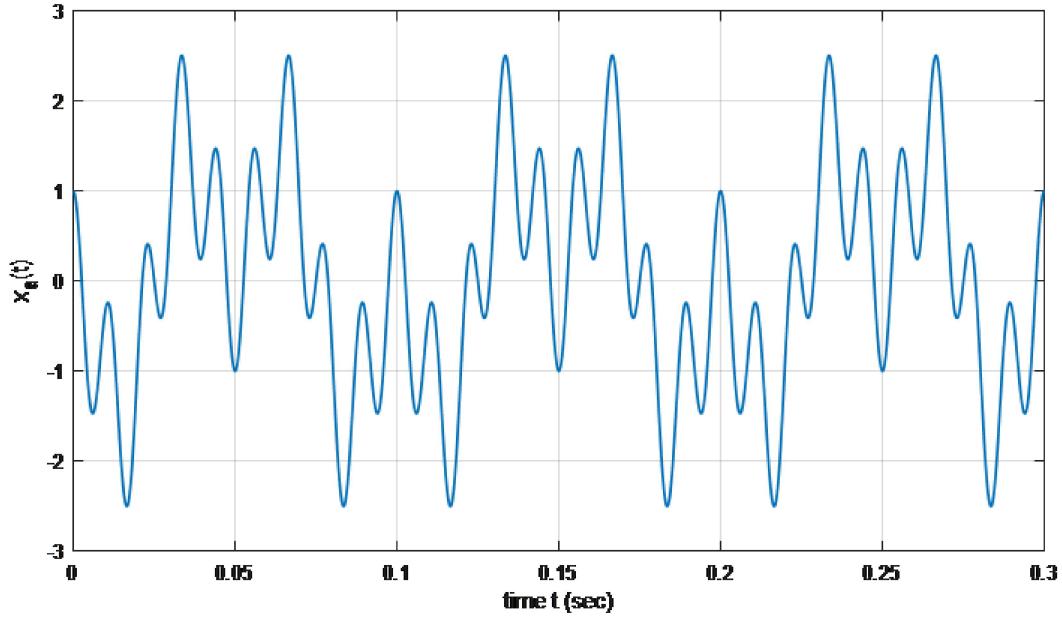
- a. $x(n) = \cos(0.6\pi n) + 2\cos(0.2\pi n)$
- b. $x(n) = \cos(0.2\pi n) + \cos(0.6\pi n) - \cos(0.4\pi n)$
- c. $x(n) = \cos(0.6\pi n)$
- d. $x(n) = \cos(0.2\pi n) + \cos(0.4\pi n)$

[Clear my choice](#)

Question 9

Not yet answered

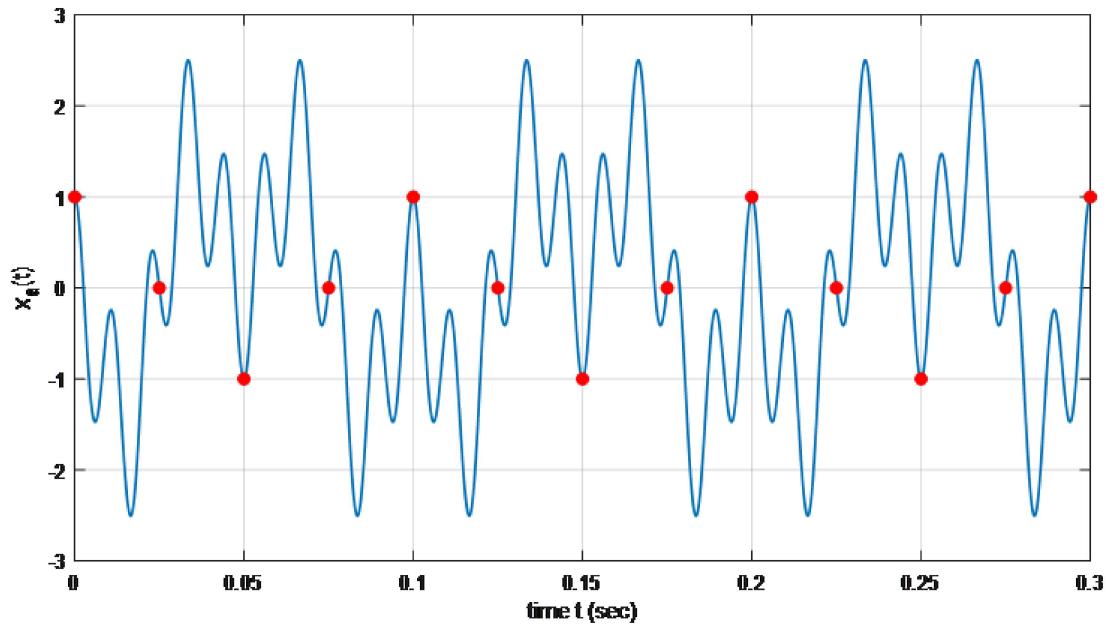
The analog signal $x_a(t)$, shown in the figure below, is sampled at a rate of $F_s = 40$ samples/sec, starting at time = 0.

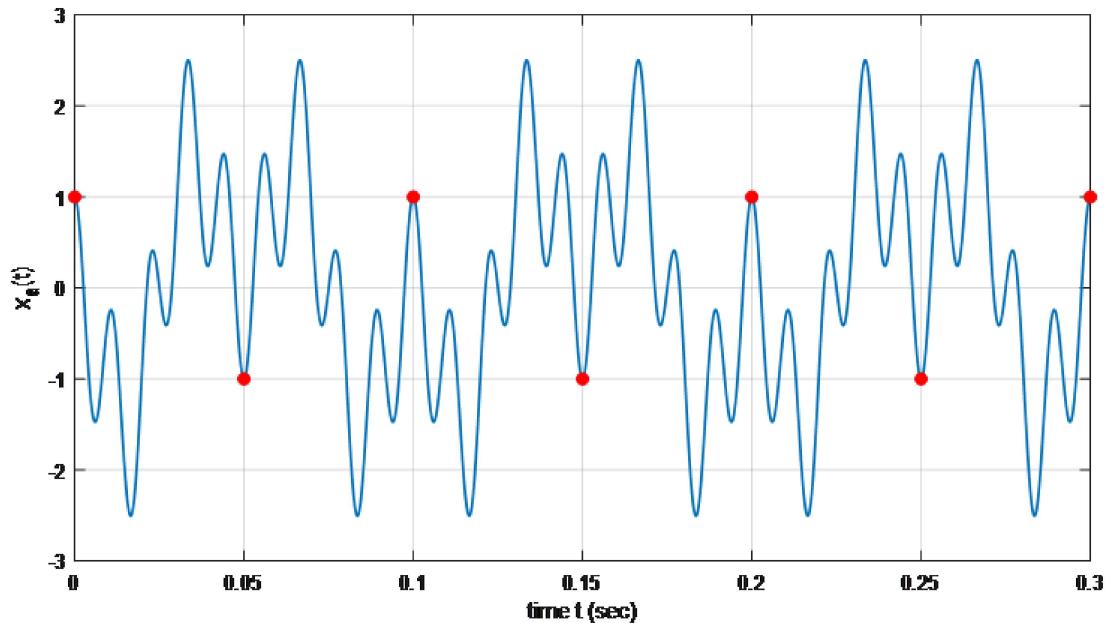
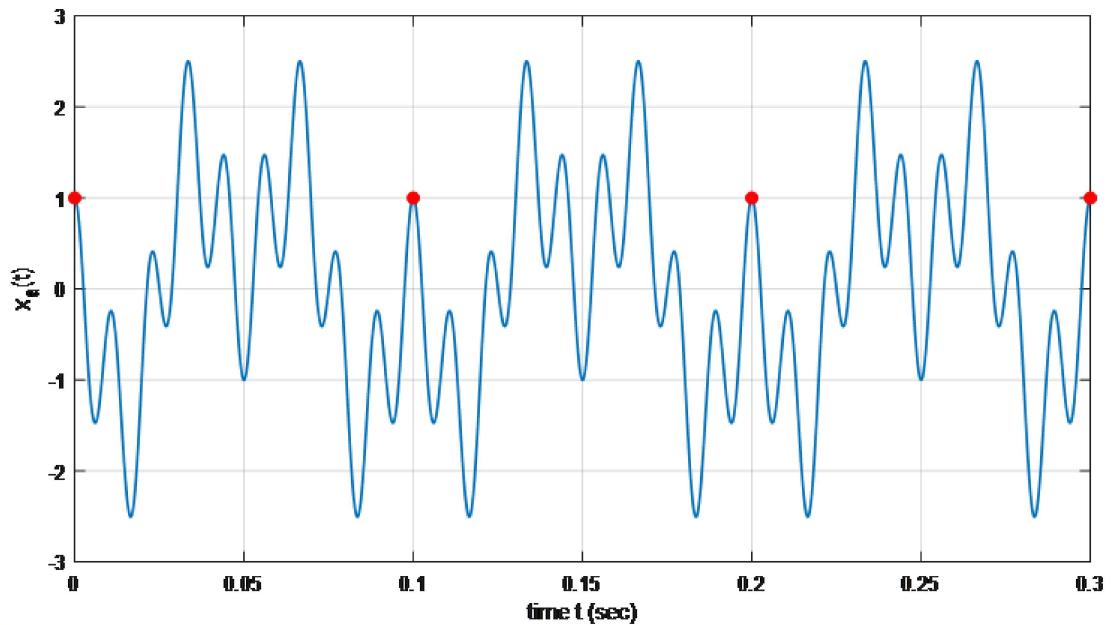
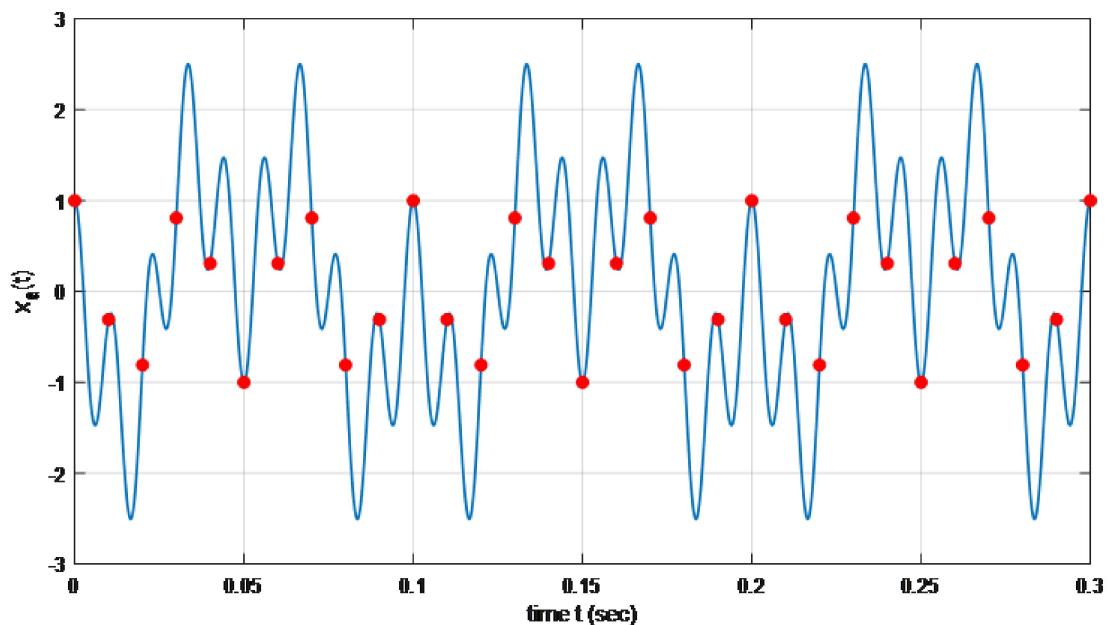


Which of the following plots represents the discrete-time signal.

Select one:

a.



b. c. d.

[Clear my choice](#)**Question 10**

Not yet answered

Consider the following system $y(n) = x(n) + x^2(n - 1)$. Examine the system with respect to the properties below.

a-Static or dynamic:

- a. Static
- b. dynamic

b-Causal or noncausal:

- a. Causal
- b. noncausal

c-Linear or nonlinear:

- a. Linear
- b. nonlinear

d-Time variant or time invariant:

- a. Time variant
- b. time invariant

Question 11

Not yet answered

Consider the following system $y(n) = x(n^2) + x^2(n - 1)$.

if the input is

$$x(n) = \{-1, 1, 2, -2, -1\}$$



, then the output of the system is:

$$y[n] = \{ \boxed{-1}, \boxed{2}, \boxed{0}, \boxed{4}, \boxed{4} \}$$

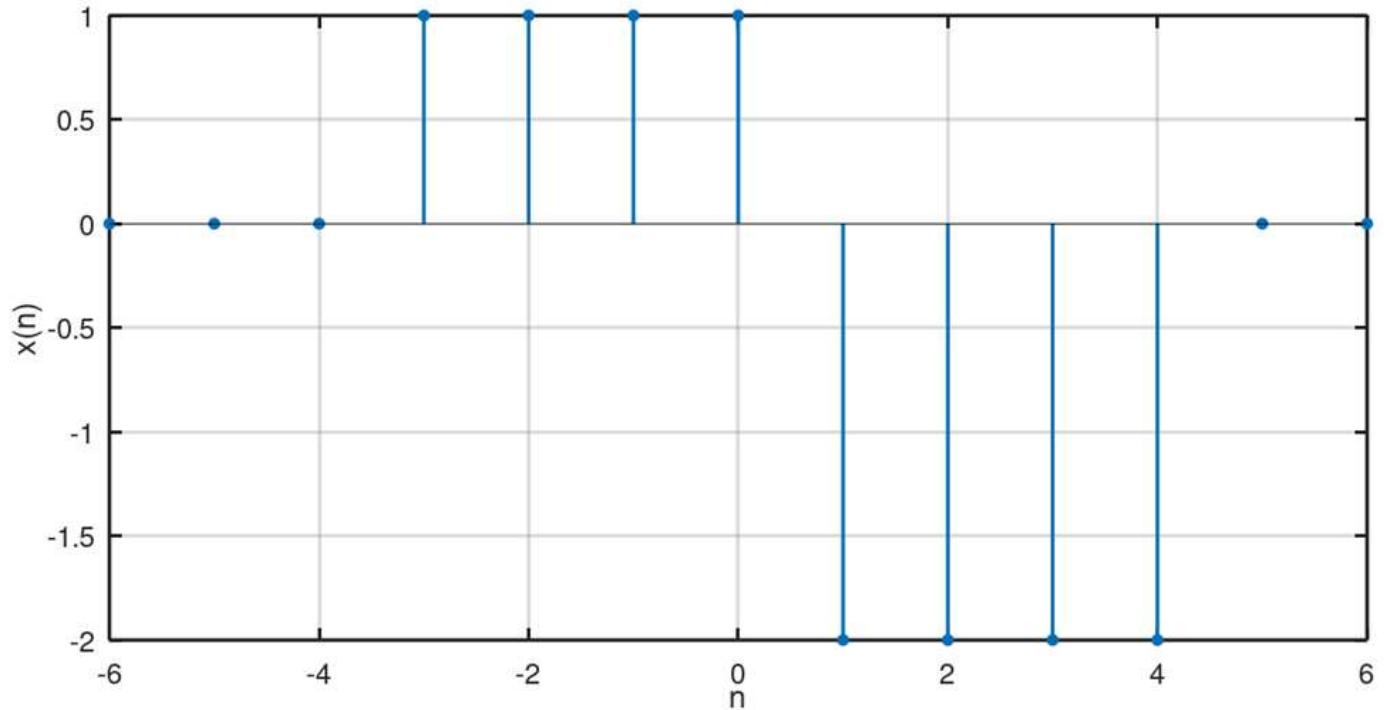


$$\boxed{1} \boxed{5} \boxed{-1} \boxed{4} \boxed{3} \boxed{-2} \boxed{2} \boxed{0}$$

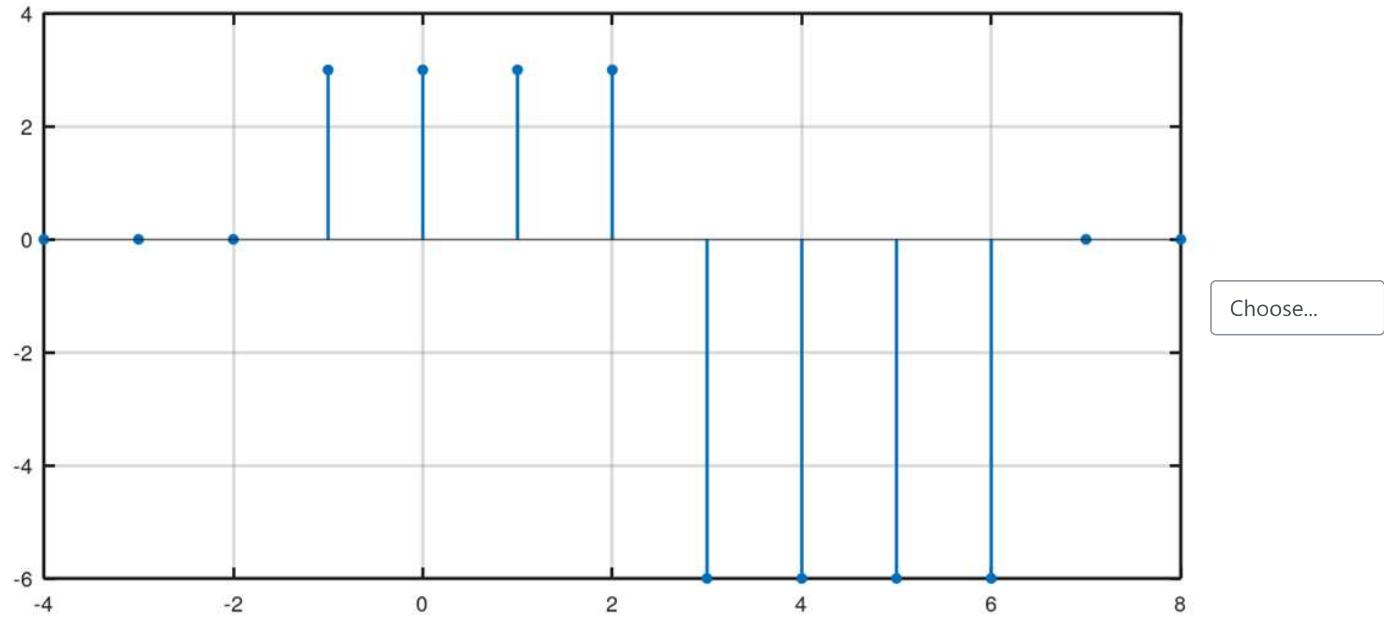
Question 12

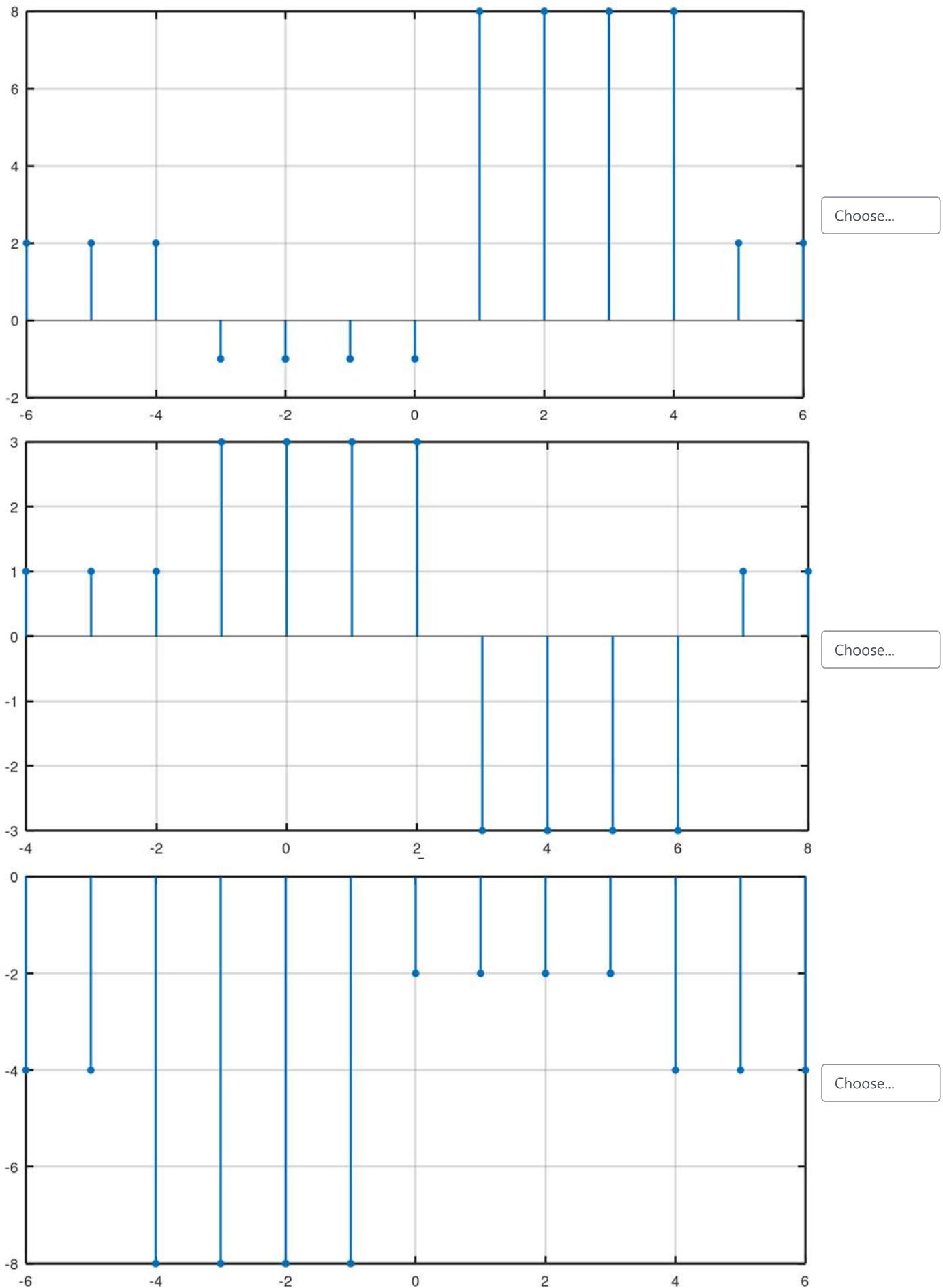
Not yet answered

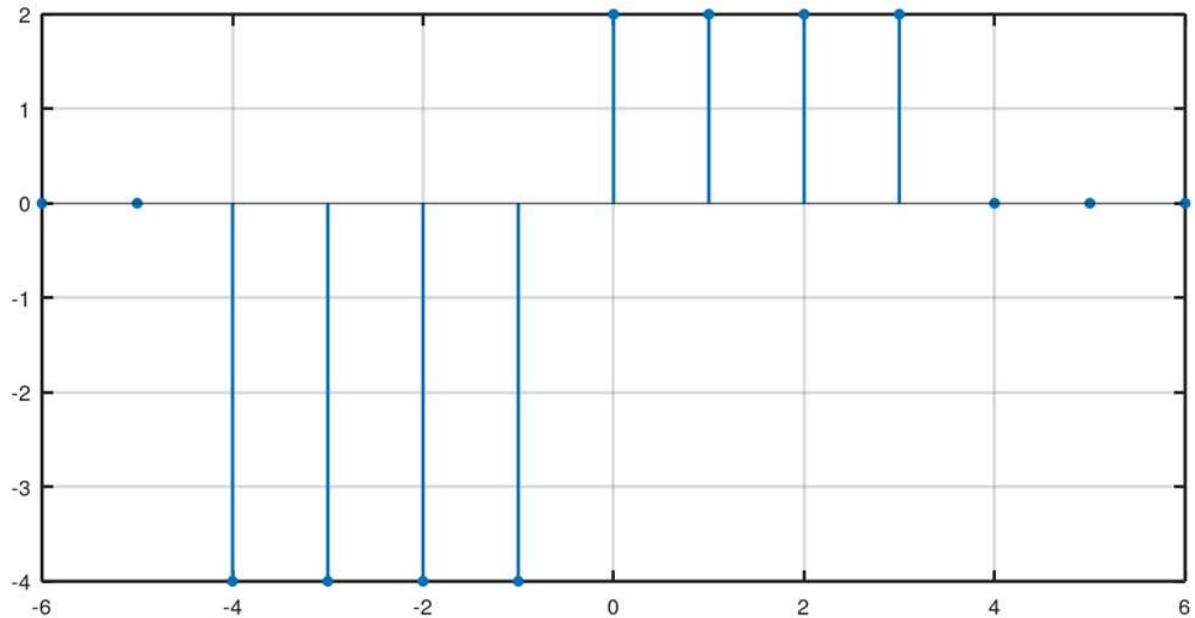
Given the discrete-time signal $x[n]$ below:



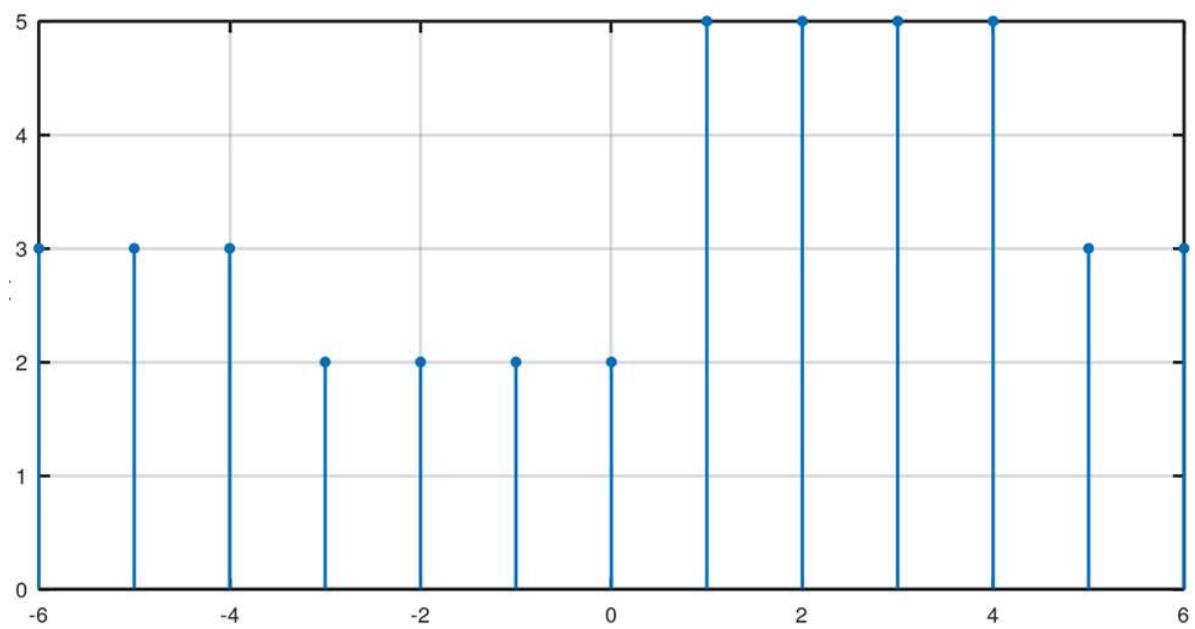
Match each given figure with the appropriate transformation







Choose...



Choose...

Question 13

Not yet answered

Consider the following system: $y[n] = x(|n|) + 2x(-n)$

Give the output for the input: $x[n] = \{1, -1, 1, 2, -2, 4\}$

Select one:

- a. $y[n] = \{12, -6, 12, 0, 2, 2\}$
- b. $y[n] = \{12, -6, 6, 0, 2, 2\}$
- c. $y[n] = \{12, -6, 6, 0, 2, 2\}$
- d. $y[n] = \{12, -6, 6, 0, 2, 2\}$

[Clear my choice](#)

Question 14

Not yet answered

Determine whether the system with the following impulse response is causal or stable

$$h(n) = 3^n \cdot u(-n)$$

Select one:

- a. non-causal and stable
- b. causal and unstable
- c. causal and stable
- d. non-causal and unstable

[Clear my choice](#)

Question 15

Not yet answered

Consider a system with the following impulse response: $h(n) = 2^n u(n)$

Determine the response of the system with the following input: $x(n) = 2\delta(n - 1) + u(n)$

Select one:

- a. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^n \frac{1-2^{n+1}}{1-2}$
- b. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^n u(n - 1)$
- c. None of the answers
- d. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^{n-1} u(n - 1)$

[Clear my choice](#)

Question 16

Not yet answered

The result of the convolution between $x1[n] = \{1, 2, 3, 4\}$ and $x2[n] = \{1, -1, \underline{0}, 1\}$

note that time origin is specified by an underline

Select one:

- a. $\{1, 1, \underline{1}, 2, -2, 3, 4\}$
- b. $\{4, 3, \underline{1}, 1, 1, 2, -2\}$
- c. $\{1, 1, \underline{1}, -2, 2, 3, 4\}$
- d. $\{\underline{1}, 1, 1, 1\}$

[Clear my choice](#)

Question 17

Not yet answered

Check whether the following system is: static, causal, linear and time invariant

$$y(n) = x(n) \cdot x(n - 2)$$

Select one:

- a. dynamic, linear, non-causal, time variant
- b. dynamic, nonlinear, non-causal, time variant
- c. static, linear, causal, time variant
- d. dynamic, nonlinear, causal, time invariant

[Clear my choice](#)

Question 18

Not yet answered

Consider a system with an input $x[n]$ and an output $y[n]$ defined by

$$y(n) = \sum_{k=n-5}^{n+5} x(k)$$

That the system is characterized as:

Select one:

- a. Nonlinear, time-variant, causal
- b. Linear, Time-variant, causal
- c. Nonlinear, Time-variant, non-causal
- d. Linear, Time-invariant, non-Causal

[Clear my choice](#)

Question 19

Not yet answered

The energy E and power P of the following signal are

$$x(n) = u(n) - u(n - 6)$$

Select one:

- a. $E = 6$ joule and $P = 0$ watt
- b. $E = 9$ joule and $P = 0$ watt
- c. $E = 12$ joule and $P = 0$
- d. $E = \infty$ and $P = 6$ watt

[Clear my choice](#)

Question 20

Not yet answered

Evaluate the following expression

$$\sum_{n=-\infty}^{\infty} \delta(n-2) \cdot \cos(3n)$$

Select one:

- a. $\sum_{n=-\infty}^{\infty} \cos(2)$
- b. $\cos(6)$
- c. $\cos(3)$
- d. $\sum_{n=-\infty}^{\infty} \cos(6)$

[Clear my choice](#)**Question 21**

Not yet answered

Evaluate the following expression

$$\sum_{n=-\infty}^{\infty} e^{n^2} \cdot \delta(n-2)$$

Select one:

- a. e^2
- b. $\sum_{n=-\infty}^{\infty} e^4$
- c. e^4
- d. $\sum_{n=-\infty}^{\infty} e^{-4}$

[Clear my choice](#)**Question 22**

Not yet answered

The following sequence is equivalent to

$$x(n) = u(n+2) \cdot u(-n+3)$$

Select one:

- a. $x(n) = 1 \text{ for } -3 \leq n \leq 2$
- b. $x(n) = 1 \text{ for } -3 \leq n \leq -2$
- c. $x(n) = 1 \text{ for } -2 \leq n \leq 3$
- d. $x(n) = 1 \text{ for } 2 \leq n \leq 3$

[Clear my choice](#)

Question 23

Not yet answered

Find the zero input response (y_{zi}) of the following system:

$$y[n] - y[n-1] - 2y[n-2] = x[n] \text{ and } y[-1] = 1; y[-2] = 0$$

Select one:

- a. $Y[n] = 1/3 (-1)^n - 4/3 (2)^n$
- b. $Y[n] = -1/3 (-1)^n - 4/3 (2)^n$
- c. $Y[n] = -1/3 (-1)^n + 4/3 (2)^n$
- d. $Y[n] = -1/2 (-1)^n - 4/6 (2)^n$

[Clear my choice](#)

Question 24

Not yet answered

A second-order recursive system is described by the following difference equation

$$y[n] + 5y[n-1] + 4y[n-2] = x[n] \text{ where } y[-1]=2 \text{ and } y[-2]=1$$

Find the system response (total solution) for $x[n]=4u[n]$

Select one:

- a. $C_1(4)^n + C_2(-1)^n$
- b. $C_1(4)^n + C_2(1)^n + 0.4u[n]$
- c. $C_1(-4)^n + C_2(-1)^n + 0.4u[n]$
- d. $C_1(-4)^n + C_2(-1)^n + 4u[n]$

[Clear my choice](#)

Question 25

Not yet answered

A discrete-time system is governed by the following difference equation:

$$y(n) + y(n-1) - 2y(n-2) = x(n)$$

Find the expression of the impulse response $h(n)$ in a compact form.

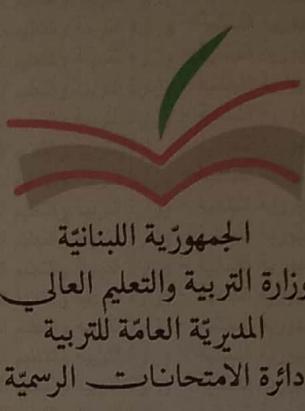
Select one:

- a. $h(n) = [3 - (2)^n]u(n)$
- b. $h(n) = [3 + (-2)^n]u(n)$
- c. $h(n) = [\frac{1}{3} - \frac{2}{3}(2)^n]u(n)$
- d. $h(n) = [\frac{1}{3} + \frac{2}{3}(-2)^n]u(n)$

[Clear my choice](#)

[◀ Announcements](#)[Jump to...](#)

رقم الترشيح: ٢٠٣٨٤



إفادة نجاح
في امتحانات

شهادة الثانوية العامة
فرع العلوم العامة

رقم الشهادة: ٤٢٩٢

إن المدير العام للتربية يثبت أن:

مرسى فتحي البقاعي المولودة سنة ٢٠٠٣ في طرابلس،
قد فازت في امتحانات شهادة الثانوية العامة، فرع العلوم العامة، لدورة ٢٠٢١ العادلة
ونالت العلامات التالية:

العلامة القصوى	علامة المرشح	المادة
١٢٠	١٠٤	رياضيات
٨٠	٧٢	فيزياء
٦٠	٥٤	كيمياء
٤٠	٢٥	لغة عربية وآدابها
٣٠	٢٠	لغة أجنبية أولى
٣٠	٢٧	تربيبة وطنية وتنشئة مدنية
علامة الاستدراك		المجموع العام
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ثلاث منة وعلامتان		الدرجة
جيد جداً		

بيروت في: ٢٠٢١/٠٨/٣٠

مختار

عن المدير العام للتربية

رئيسة دائرة الامتحانات الرسمية بالتكليف

أمل خليل شعبان



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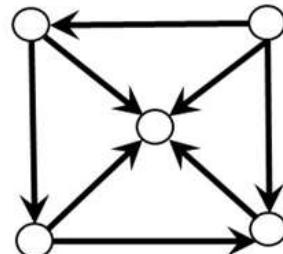
Question 1

Answer saved

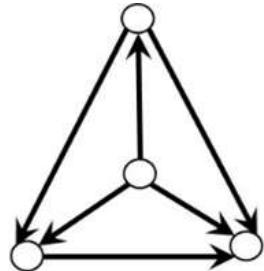
Which of the following is not an acyclic directed graph?

Select one:

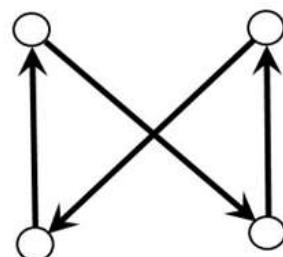
a.



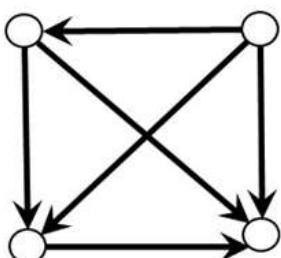
b.



c.



d.

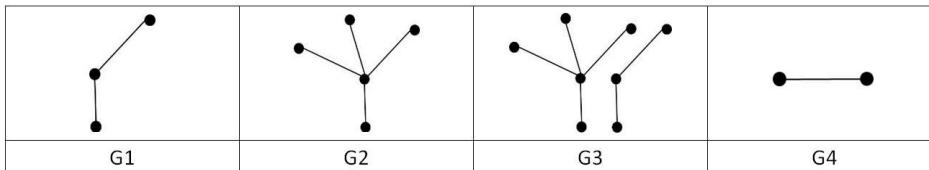


[Clear my choice](#)

Question 2

Answer saved

Which of the following graphs is not a tree?



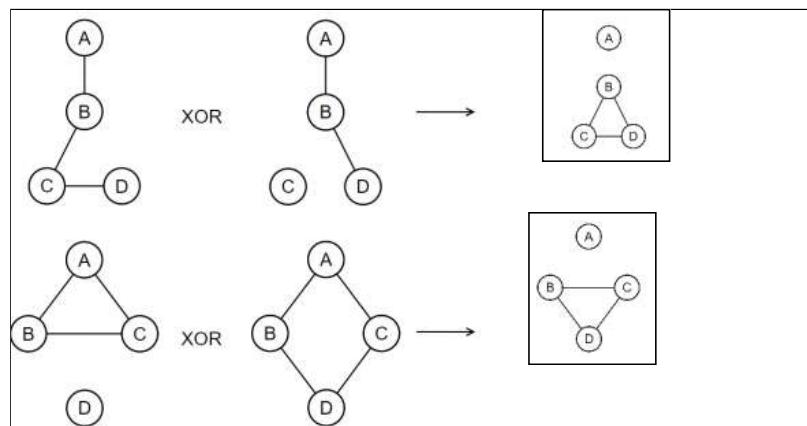
Select one:

- a. G1
- b. G2
- c. G3
- d. G4

[Clear my choice](#)**Question 3**

Answer saved

Complete the XOR operation



Question 4

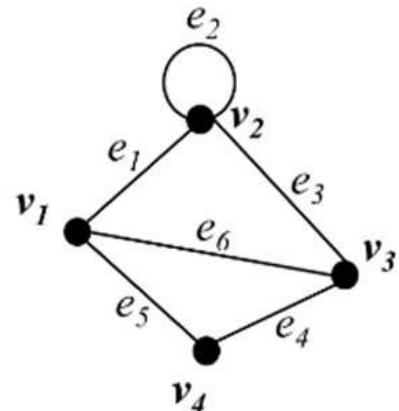
Answer saved

Which graph is represented by the following incidence matrix?

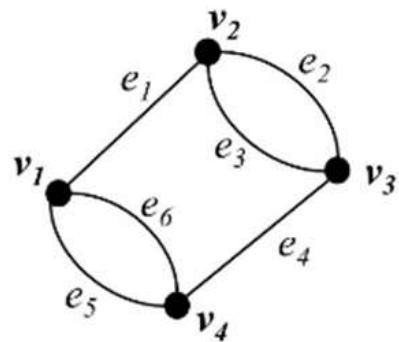
	e_1	e_2	e_3	e_4	e_5	e_6
v_1	1	0	0	0	1	1
v_2	1	1	1	0	0	0
v_3	0	0	1	1	0	0
v_4	0	0	0	1	1	1

Select one:

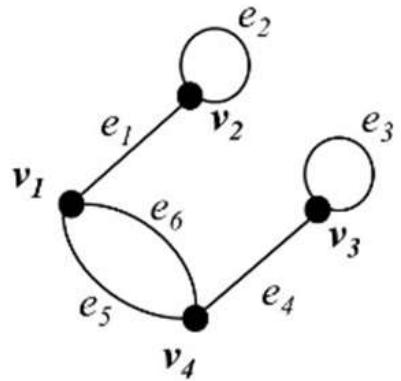
a.



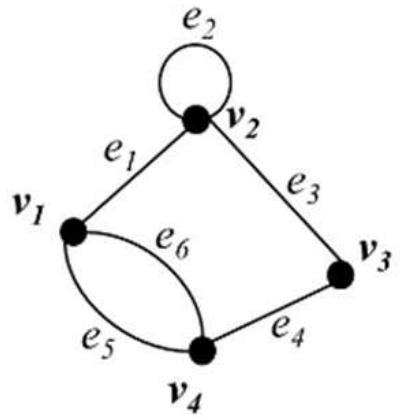
b.



○ c.



◎ d.

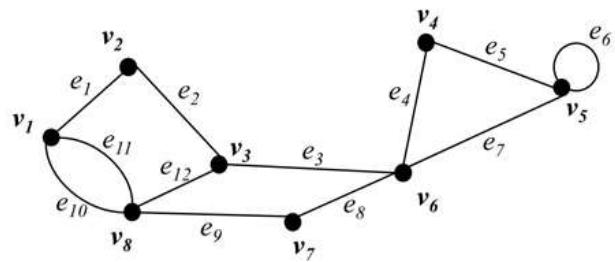


[Clear my choice](#)

Question 5

Answer saved

Label each of the following sequences with "Trail" or "Not a trail" based on the provided graph.



v4, e5, v5, e7, v6, e4, v4 : Trail

v1, e1, v2, e2, v3, e12, v8, e11, v1: Trail

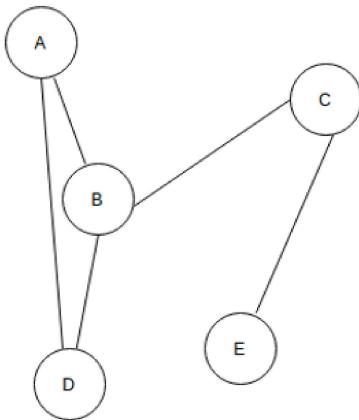
v3, e3, v6, e3, v3 : Not a trail

v1, e11, v8, e12, v3, e2, v2, e1, v1, e10, v8: Trail

Trail Not a trail

Question **6**
Answer saved

In the given graph identify the cut vertices



Select one:

- a. C and B
- b. C and D
- c. B and E
- d. A and E

[Clear my choice](#)

Question **7**
Answer saved

Flipping the ones and zeros in the incidence matrix of any simple graph will result in the incidence matrix of its complement.

Select one:

- True
- False

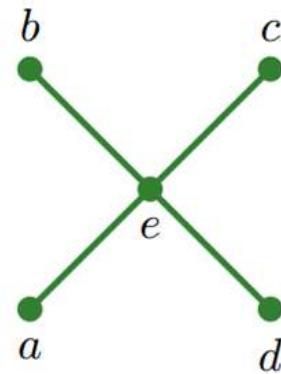
Question 8

Answer saved

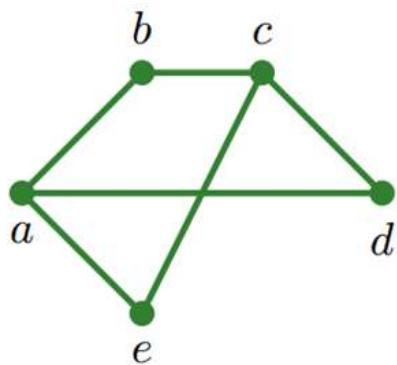
Select the bipartite graphs among the following:

Select one or more:

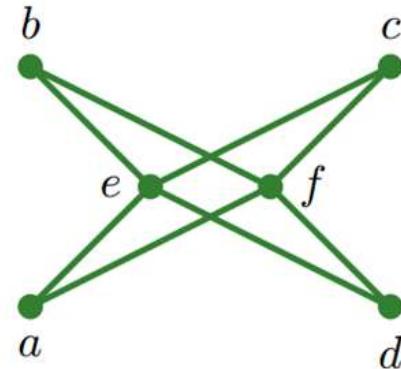
a.



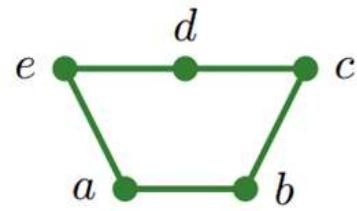
b.



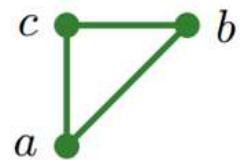
c.



□ d.



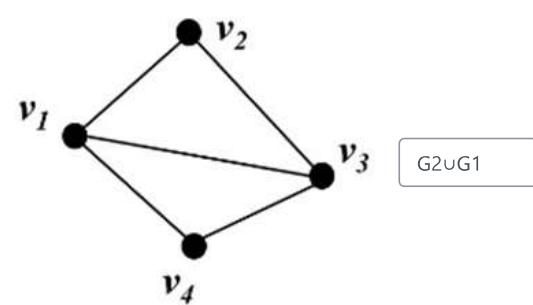
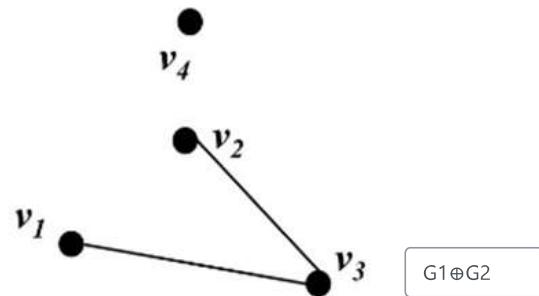
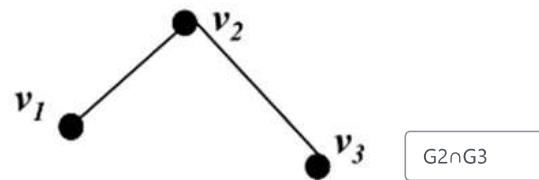
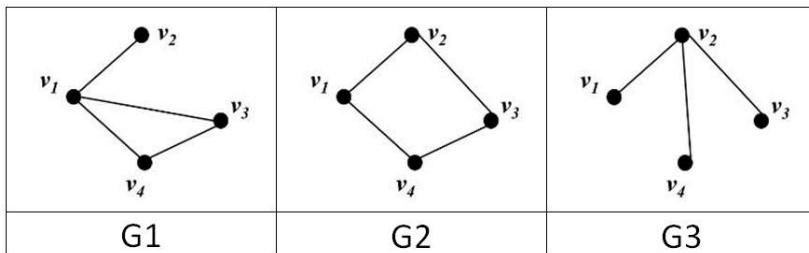
□ e.

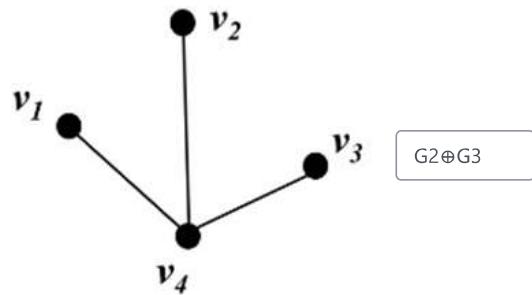


Question 9

Answer saved

Using graphs F, G, and H, match each of the following operations with the corresponding graph.

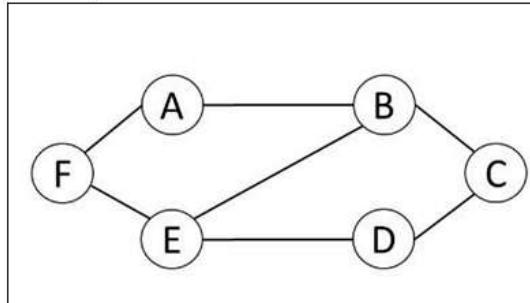




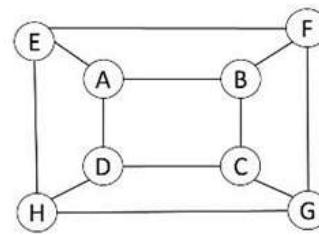
Question 10

Answer saved

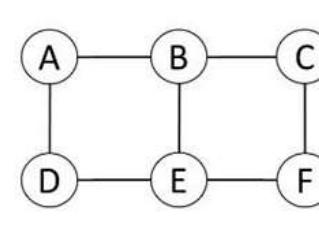
Which of the following graphs is not bipartite?



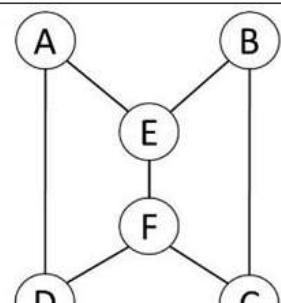
G1



G2



G3



G4

Select one:

- a. All of them are bipartite
- b. G1
- c. G2
- d. G3
- e. G4
- f. None of them is bipartite

[Clear my choice](#)

Question 11

Not yet
answered

Eight people are going on a road trip and must divide the group into different vehicles so that

- Ali is not in the same car with Fadi.
- Elie is not in the same car with Sarah.
- Fadi is not in the same car with Nadine.
- Elie is not in the same car with Farid.
- Nadine is not in the same car with Hala.
- Sarah is not in the same car with George.
- Ali is not in the same car with Farid.
- Fadi is not in the same car with George.
- Ali is not in the same car with Hala.
- Sarah is not in the same car with Hala.
- Nadine is not in the same car with Farid.
- George is not in the same car with Hala.

How many vehicles are needed?

Select one:

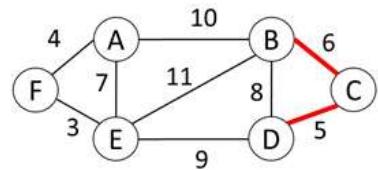
- a. 3
- b. 2
- c. 4
- d. 5
- e. 6

[Clear my choice](#)

Question **12**

Answer saved

The edges highlighted in red are the ones that have been selected so far using Prim's algorithm to find the minimum spanning tree. Which edge should be selected next?



Select one:

- a. BD
- b. DE
- c. AE
- d. EF
- e. AF

[Clear my choice](#)

Question **13**

Answer saved

Consider a graph $G(V, E)$ with $V=\{1,2,3,4\}$ and $E=\{a,b,c,d,e,f\}$ having the following incident matrix

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1	1	1	1	0	0	0
2	1	1	0	1	0	0
3	0	0	0	1	1	1
4	0	0	1	0	1	1

It has a weight on his edges given by:

Weight on *a* is 3, on *b* is 2, on *c* is 1, on *d* is 2, on *e* is 4 and on *f* is 2.

How many minimum spanning trees does this graph have?

Select one:

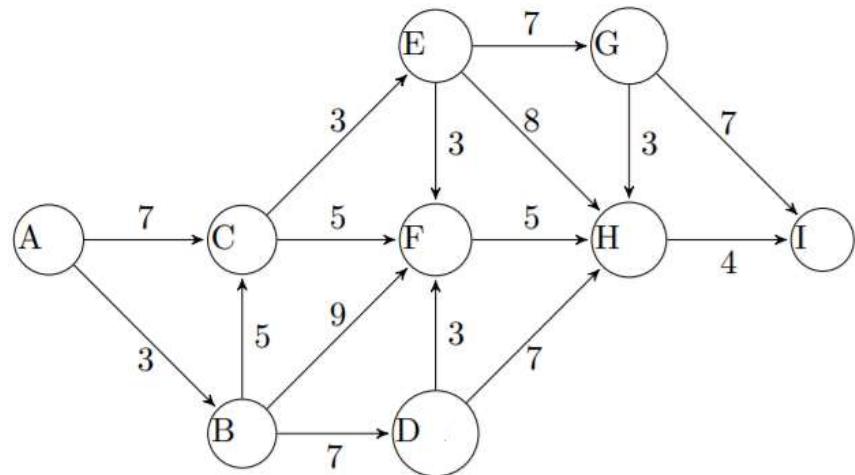
- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

[Clear my choice](#)

Question **14**

Answer saved

Consider the following directed graph. How many shortest path from A to I?



Select one:

- a. 3
- b. 2
- c. 1
- d. 4

[Clear my choice](#)

Question **15**

Not yet
answered

Consider a complete undirected graph G with 4 vertices. The weight of edge $\{x,y\}$ is given in the below matrix as W_{xy} . What is the largest possible value of X , if the edge weighted X is to be included in at least one shortest path between some pair of vertices

$$W = \begin{matrix} & \begin{matrix} a & b & c & d \end{matrix} \\ \begin{matrix} a \\ b \\ c \\ d \end{matrix} & \begin{pmatrix} 0 & 2 & 8 & 5 \\ 2 & 0 & 5 & 8 \\ 8 & 5 & 0 & X \\ 5 & 8 & X & 0 \end{pmatrix} \end{matrix}$$

Select one:

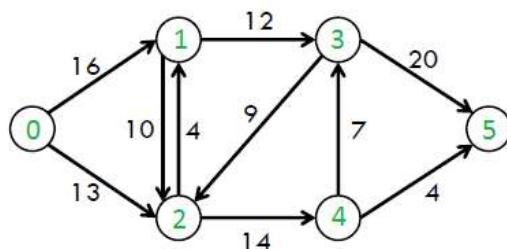
- a. 8
- b. 10
- c. 11
- d. 12

[Clear my choice](#)

Question 16

Not yet
answered

Given the following network with capacities on arcs, identify a min-cut in the network when sending flow from 0 to 5



Select one:

- a. (1,2) (3,2) (2,4)
- b. (1,3) (3,2) (4,3) (4,5)
- c. (3,5) (4,5)
- d. (0,1) (0, 2)

[Clear my choice](#)

Question 17

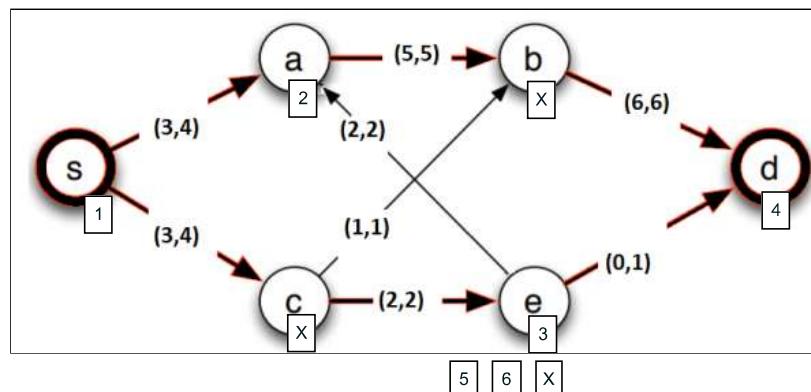
Answer saved

Consider the following max flow problem. The tuple (f, c) on each edge indicates the flow f on the edge and its capacity c .

You are asked to identify an augmenting path from s to d

Label the nodes in ascending order along the augmenting path starting from 1 on s . Use as much labels as you need. Label with X nodes that are not visited by the augmenting path.

Note: You might need to build the residual network to see the augmenting path.



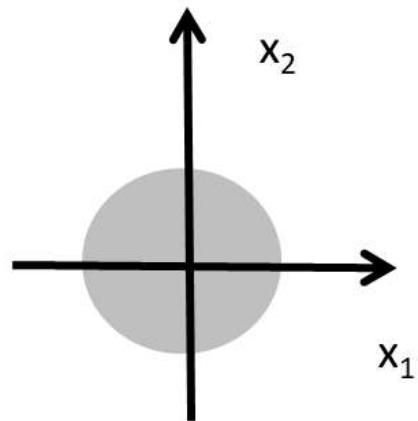
Question **18**

Answer saved

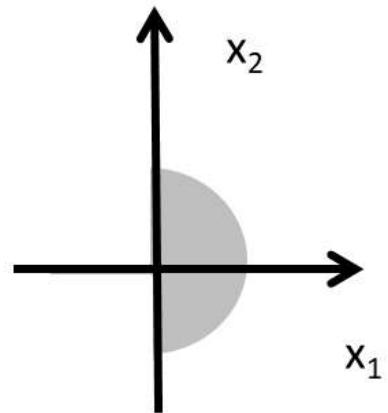
Assuming $\Omega = \{(x_1, x_2) \in R^2, x_1 \geq 0\}$, which of the following is a neighborhood of (0,0)?

Select one:

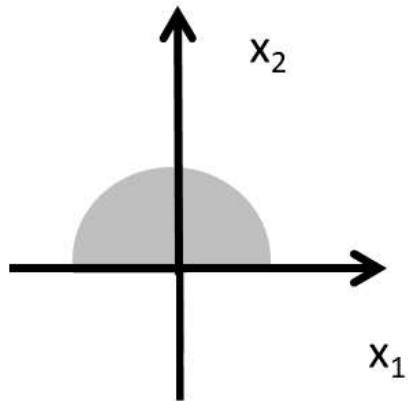
a.



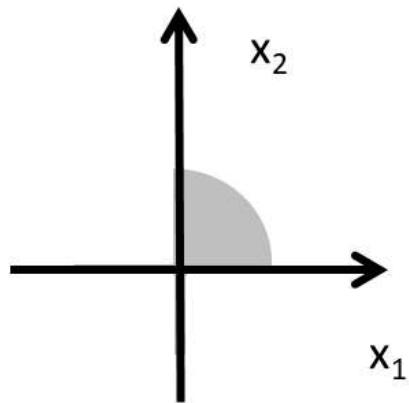
b.



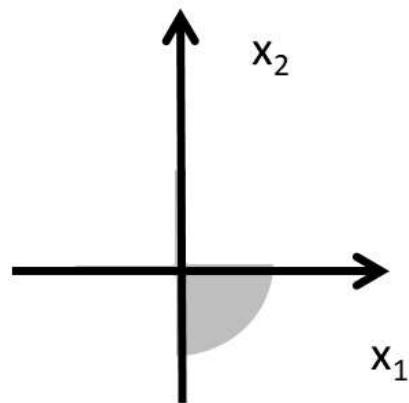
c.



d.



e.



[Clear my choice](#)

Question 19

Answer saved

For each of the following feasible domains, indicate whether it has boundary points only, interior points only, or both.

$\Omega = \{(x_1, x_2) \in R^2, x_1 > 0\}$:

$\Omega = \{(x_1, x_2) \in R^2, x_1 = x_2\}$:

$\Omega = \{x \in R, 1 \leq x \leq 2\}$:

$\Omega = \{(x_1, x_2) \in R^2, (x_1)^2 + (x_2)^2 = 1\}$:

Question 20

Answer saved

Given $f(x, y) = -x^2 - y^4 + 3$ and starting at point (1,-1), indicate for each of the following directions whether f would increase or decrease.

(0,1):

(1,0):

(0,-1):

(-1,0):

Question 21

Answer saved

Starting from **x=1** Perform **one iteration** of the Newton method to find the maximum of

$$f(x) = \ln(2 * x + 1) - x^2$$

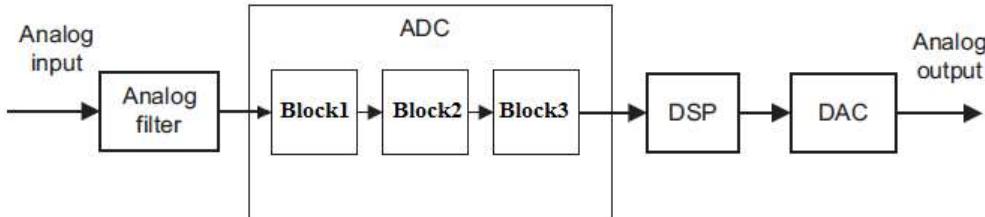
Select one:

 a. 0.45 b. 0.5 c. 0.49 d. 0.7[Clear my choice](#)[◀ Announcements](#)

Question 1

Not yet answered

The block diagram below shows the complete digital processing chain where some block are undefined:



Explain the role of the Analog filter block.

Select one:

- a. It converts continuous-time signal into discrete-time signal.
- b. It converts continuous valued signal into discrete-valued signal.
- c. It is an anti-aliasing filter that aims to ensure that Fmax does not exceed a predetermined value.
- d. It converts the processed digital signal to an analog output signal.

[Clear my choice](#)

Question 2

Not yet answered

The following discrete-time signal is:

$$x[n] = \cos(2\pi n/3) - \cos(4\pi n/7).$$

Check its periodicity and give the period if any.

Select one:

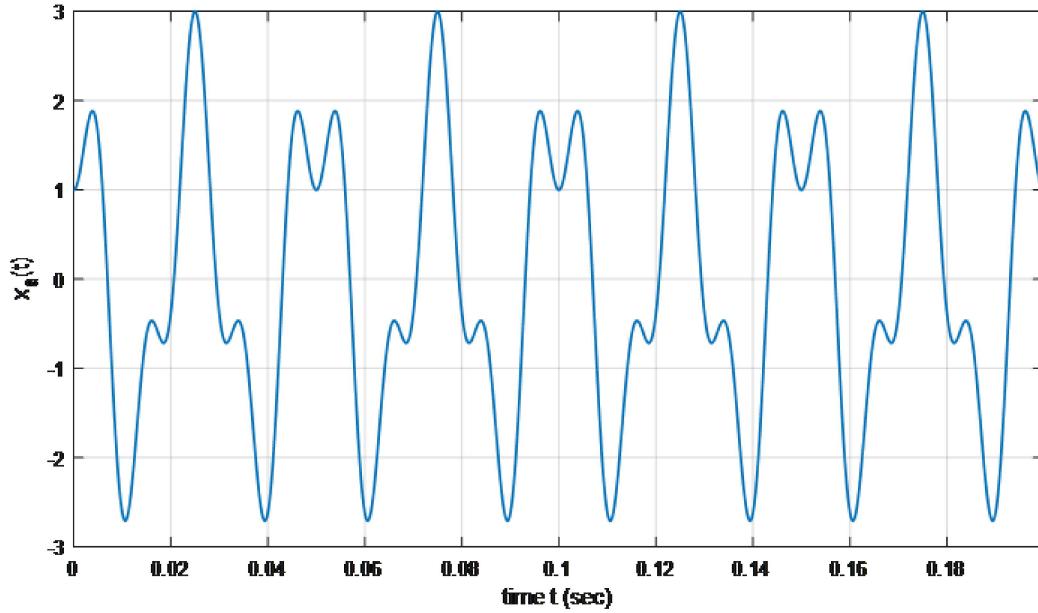
- a. periodic with period N=7 samples
- b. not periodic
- c. periodic with period N=3 samples
- d. periodic with period N=21 samples

[Clear my choice](#)

Question 3

Not yet answered

Determine the period (in seconds) of the signal $x_a(t)$ in the figure below.



Answer:

Question 4

Not yet answered

Consider the following discrete-time signal $x(n) = \cos(\pi n + \pi/2) + 2\sin(0.25\pi n) - \cos(0.5\pi n)$. Determine the period of $x(n)$.

Answer:

Question 5

Not yet answered

The analog signal $x_a(t) = \cos(90\pi t) - 3\sin(50\pi t) - \cos(30\pi t + \pi/3)$ is sampled with a sampling frequency $F_s = 80\text{Hz}$. Choose the correct statement(s).

Select one or more:

- a. The frequency $F = 45\text{Hz}$ is affected by aliasing.
- b. There is aliasing.
- c. There is no aliasing.
- d. Both frequencies $F = 45\text{Hz}$ and $F = 25\text{Hz}$ are affected by aliasing.

Question 6

Not yet answered

A continuous-time signal $x(t)$ has a bandwidth of $F = 10\text{ kHz}$ and it is sampled at $F_s = 22\text{ kHz}$, then quantized with a quantization step of 1.1 Volt. The signal is properly scaled so that $-128 < x[n] < 128$ for all n .

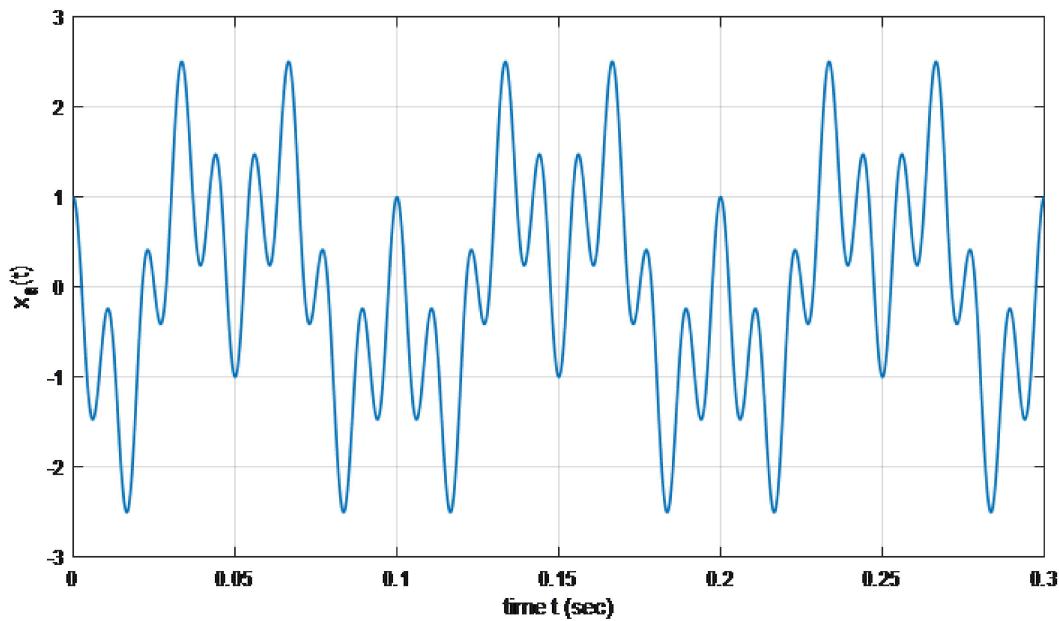
In this case, the required data rate (in Kbits/sec) should be:

Answer:

Question 7

Not yet answered

The signal in the figure below is passed into an analog-to-digital converter (ADC). The ADC is operating at $4.5Kbps$ with a resolution $\Delta = 0.01$. Determine the sampling frequency (in Hz).



Answer:

Question 8

Not yet answered

Consider the analog signal $x_a(t) = \cos(180\pi t) + \cos(60\pi t) - \cos(20\pi t)$. Determine the discrete time signal $x(n)$ if the signal is sampled at $F_s = 100Hz$.

Select one:

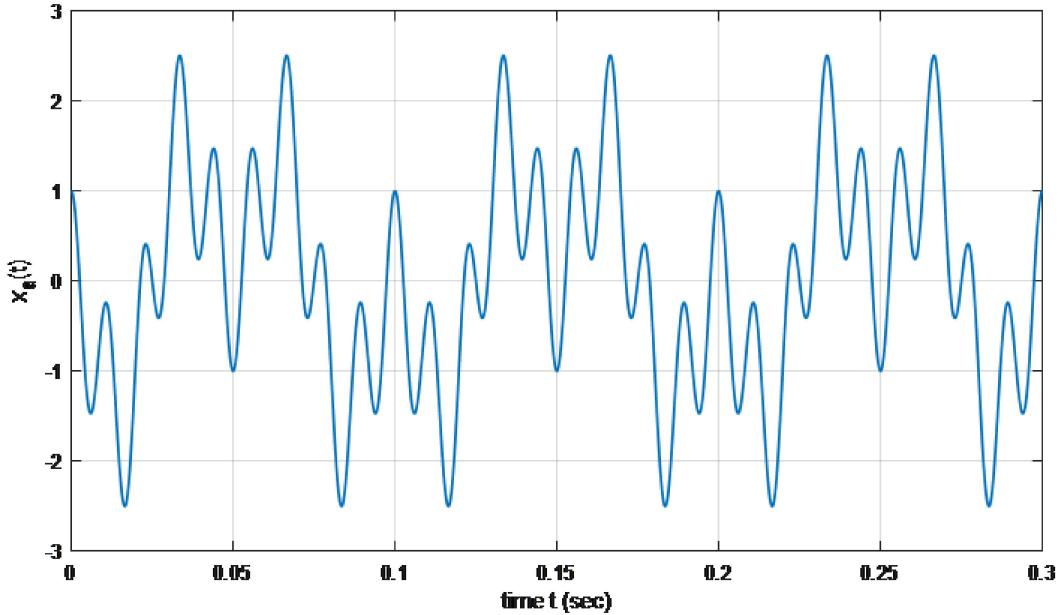
- a. $x(n) = \cos(0.6\pi n) + 2\cos(0.2\pi n)$
- b. $x(n) = \cos(0.2\pi n) + \cos(0.6\pi n) - \cos(0.4\pi n)$
- c. $x(n) = \cos(0.6\pi n)$
- d. $x(n) = \cos(0.2\pi n) + \cos(0.4\pi n)$

[Clear my choice](#)

Question 9

Not yet answered

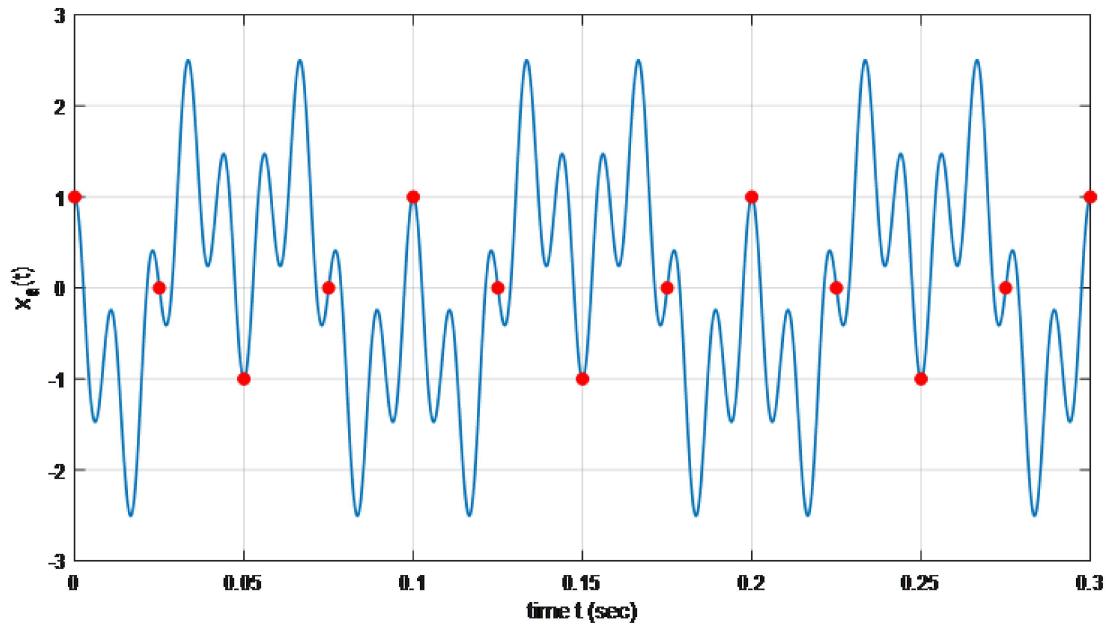
The analog signal $x_a(t)$, shown in the figure below, is sampled at a rate of $F_s = 40$ samples/sec, starting at time = 0.

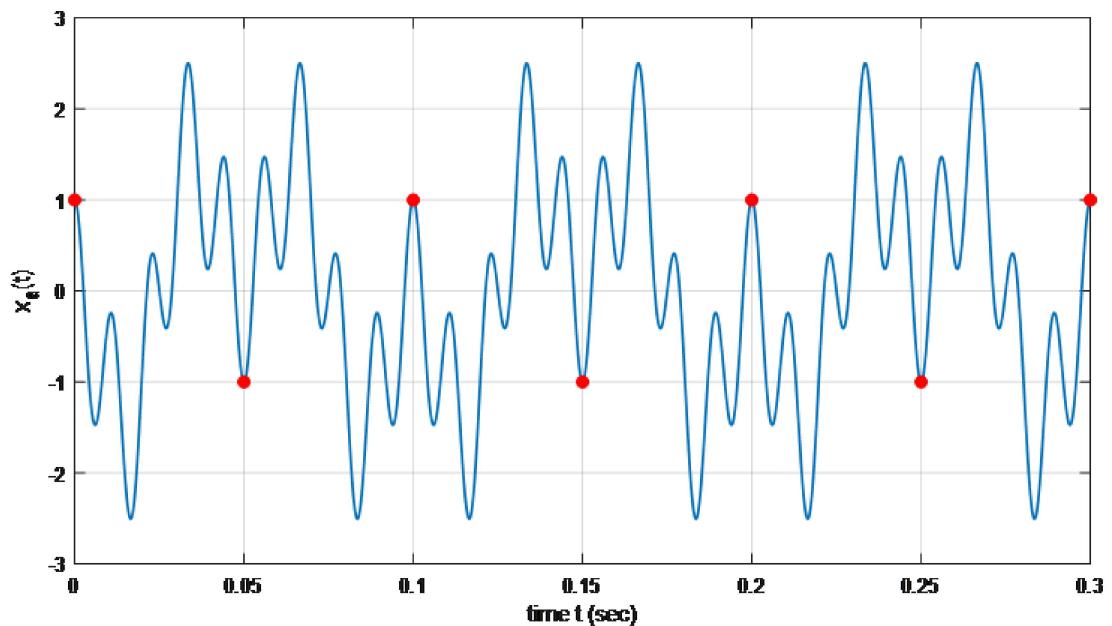
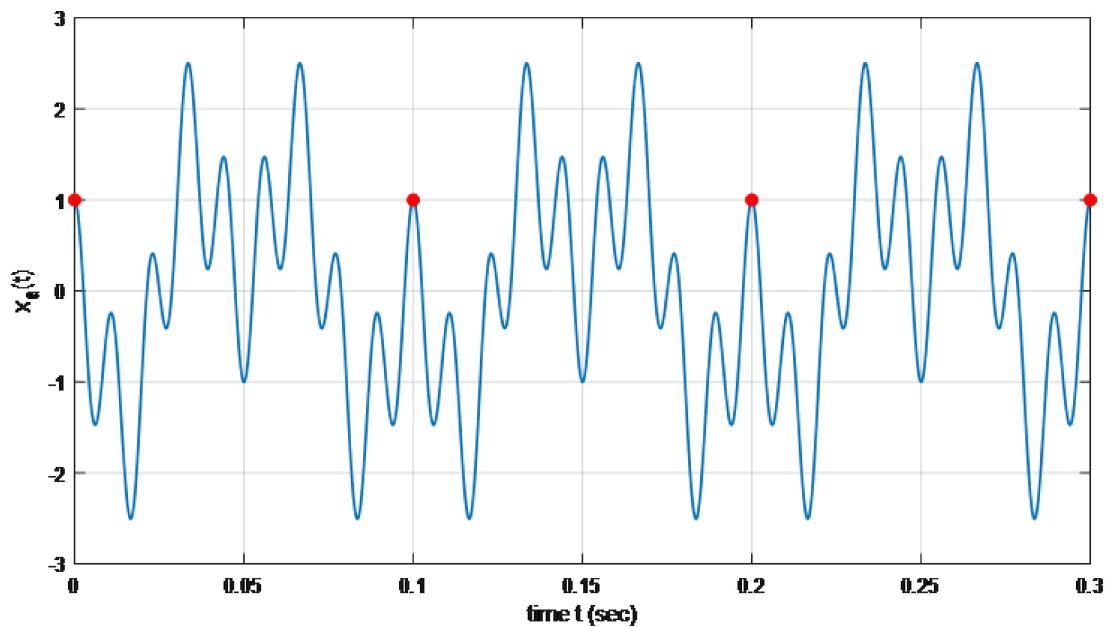
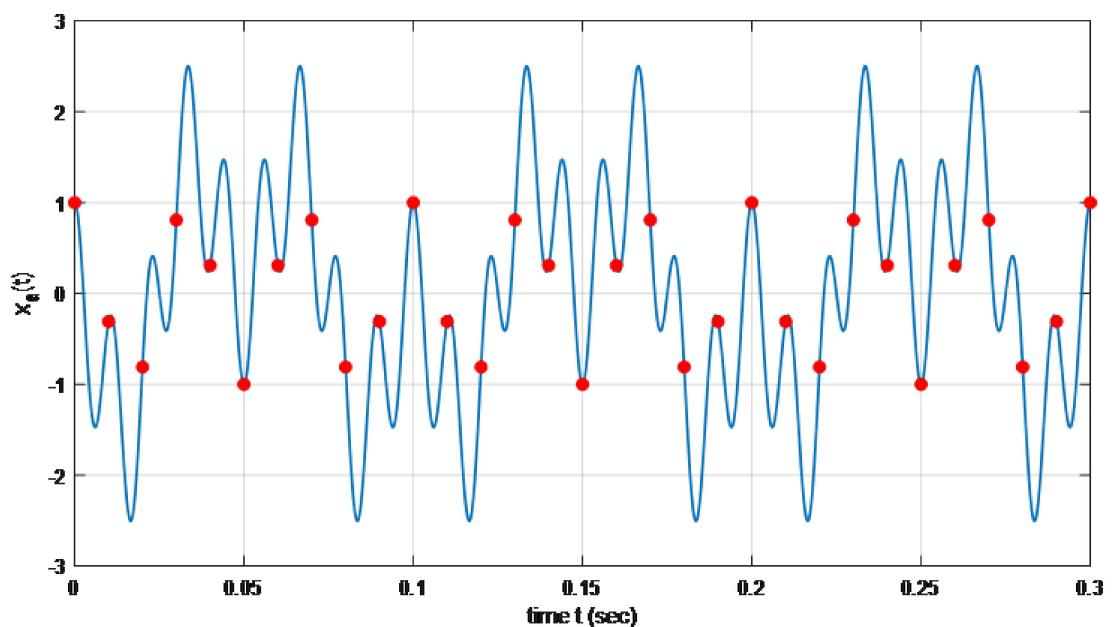


Which of the following plots represents the discrete-time signal.

Select one:

a.



b. c. d.

[Clear my choice](#)**Question 10**

Not yet answered

Consider the following system $y(n) = x(n) + x^2(n - 1)$. Examine the system with respect to the properties below.

a-Static or dynamic:

- a. Static
- b. dynamic

b-Causal or noncausal:

- a. Causal
- b. noncausal

c-Linear or nonlinear:

- a. Linear
- b. nonlinear

d-Time variant or time invariant:

- a. Time variant
- b. time invariant

Question 11

Not yet answered

Consider the following system $y(n) = x(n^2) + x^2(n - 1)$.

if the input is

$$x(n) = \{-1, 1, 2, -2, -1\}$$



, then the output of the system is:

$$y[n] = \{ \boxed{-1}, \boxed{2}, \boxed{0}, \boxed{4}, \boxed{4} \}$$

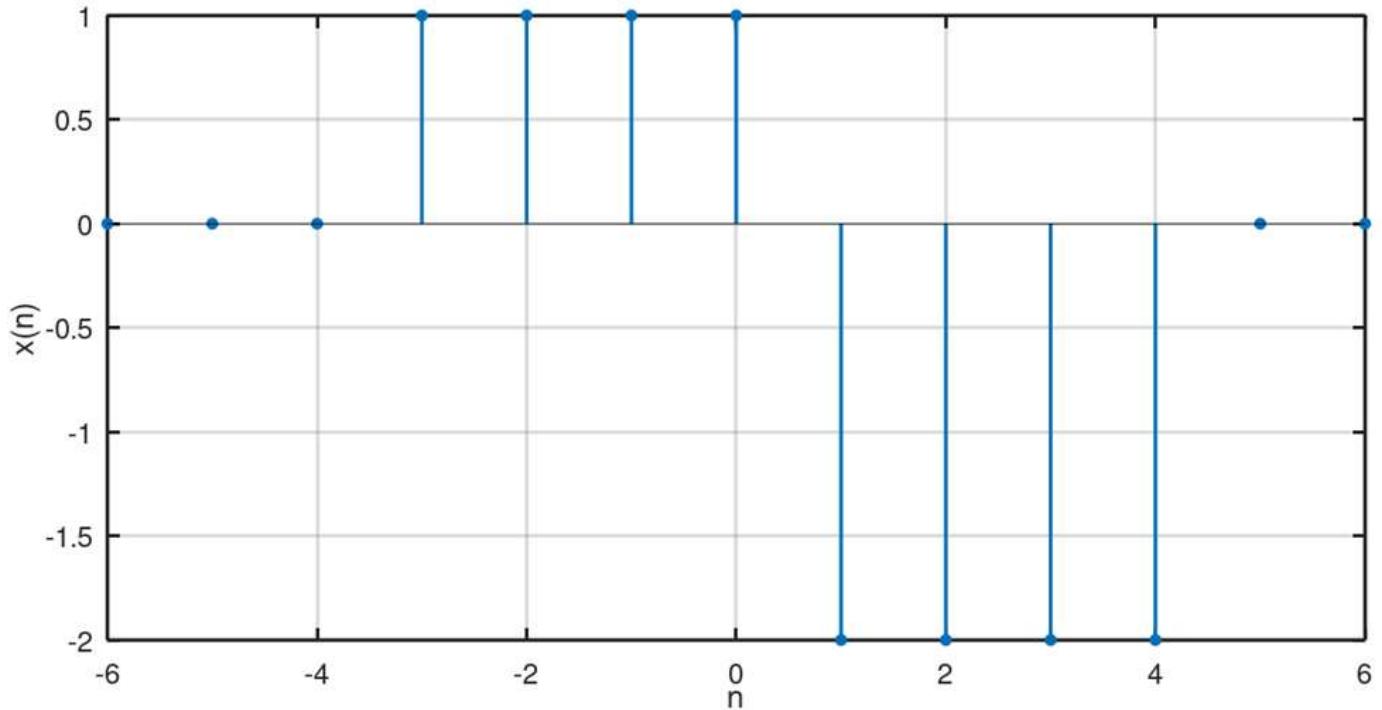


$$\boxed{1} \boxed{5} \boxed{-1} \boxed{4} \boxed{3} \boxed{-2} \boxed{2} \boxed{0}$$

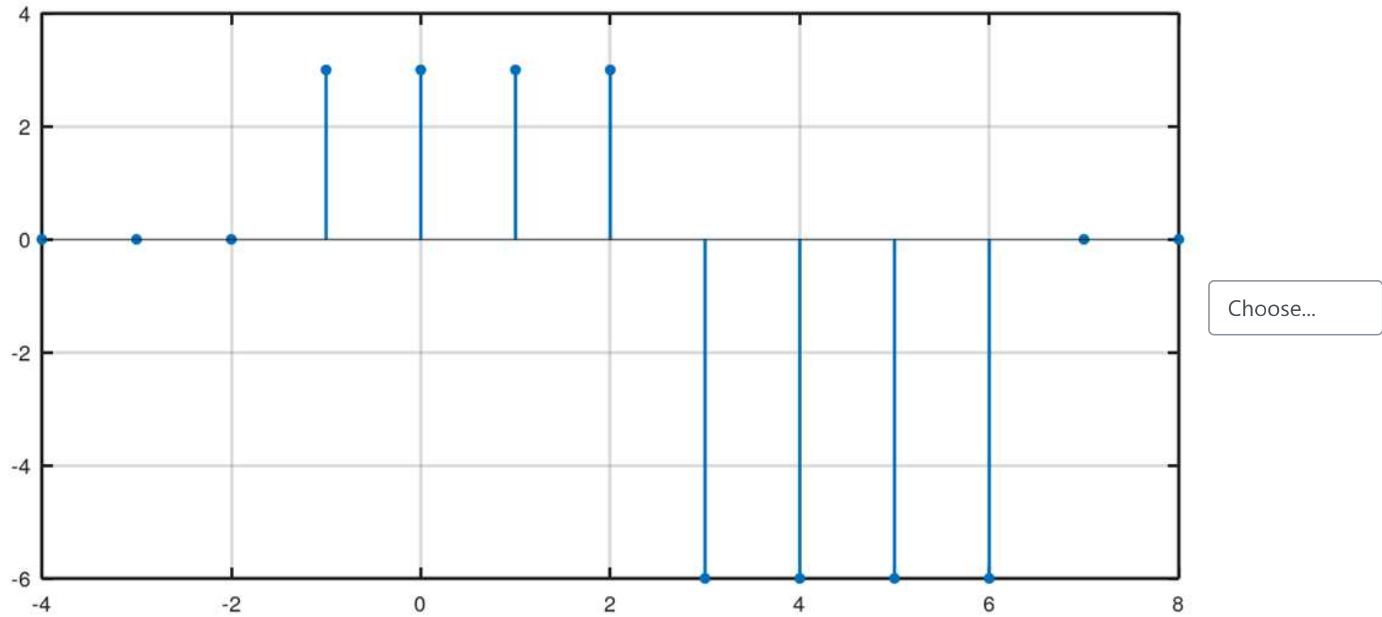
Question 12

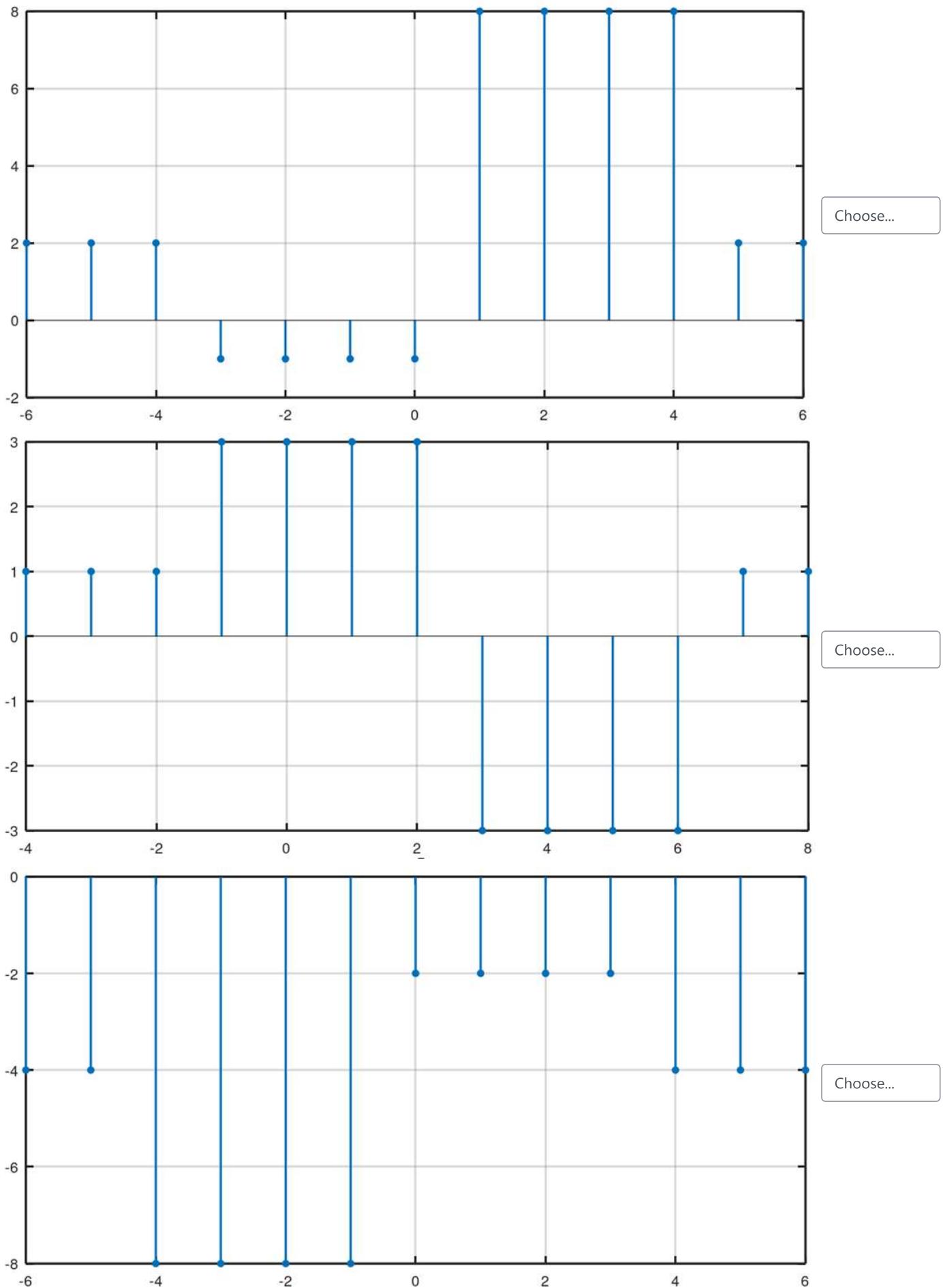
Not yet answered

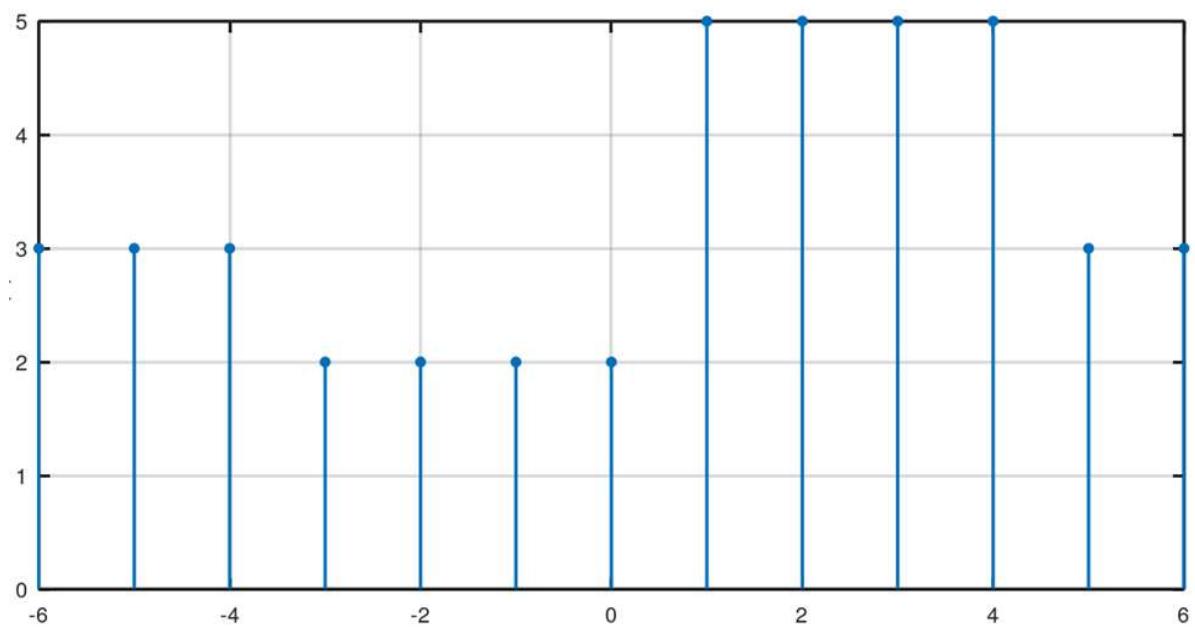
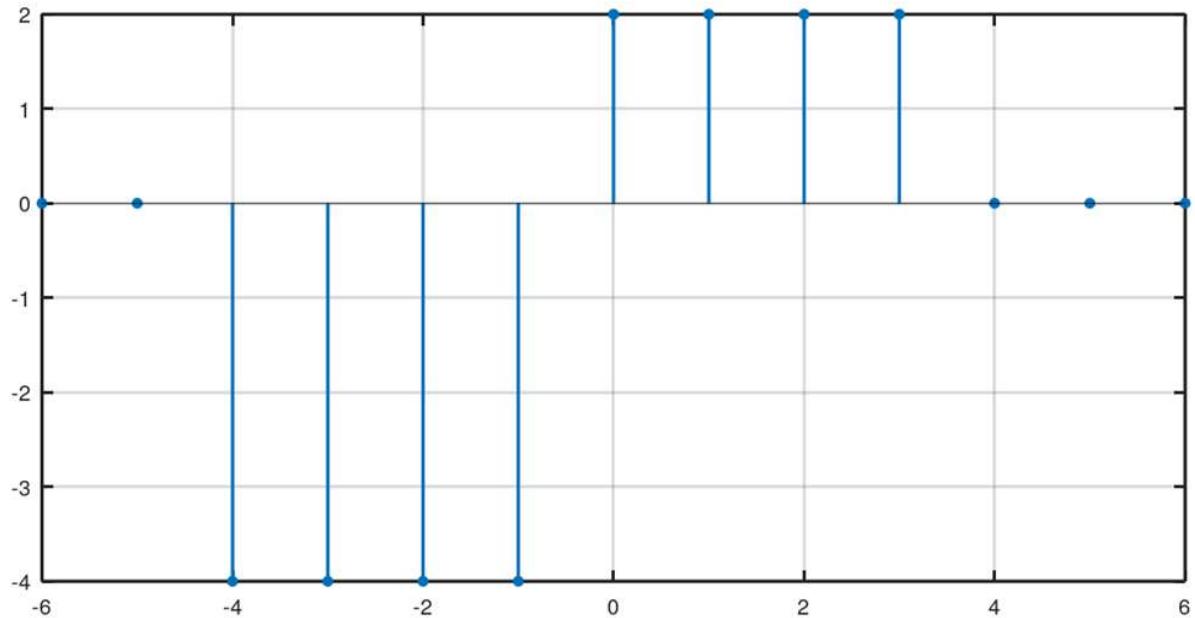
Given the discrete-time signal $x[n]$ below:



Match each given figure with the appropriate transformation







Question 13

Not yet answered

Consider the following system: $y[n] = x(|n|) + 2x(-n)$

Give the output for the input: $x[n] = \{1, -1, 1, 2, -2, 4\}$

Select one:

- a. $y[n] = \{12, -6, 12, 0, 2, 2\}$
- b. $y[n] = \{12, -6, 6, 0, 2, 2\}$
- c. $y[n] = \{12, -6, 6, 0, 2, 2\}$
- d. $y[n] = \{12, -6, 6, 0, 2, 2\}$

[Clear my choice](#)

Question 14

Not yet answered

Determine whether the system with the following impulse response is causal or stable

$$h(n) = 3^n \cdot u(-n)$$

Select one:

- a. non-causal and stable
- b. causal and unstable
- c. causal and stable
- d. non-causal and unstable

[Clear my choice](#)

Question 15

Not yet answered

Consider a system with the following impulse response: $h(n) = 2^n u(n)$

Determine the response of the system with the following input: $x(n) = 2\delta(n - 1) + u(n)$

Select one:

- a. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^n \frac{1-2^{n+1}}{1-2}$
- b. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^n u(n - 1)$
- c. None of the answers
- d. $y(n) = \frac{1-2^{n+1}}{1-2} + 2^{n-1} u(n - 1)$

[Clear my choice](#)

Question 16

Not yet answered

The result of the convolution between $x1[n] = \{1, 2, 3, 4\}$ and $x2[n] = \{1, -1, \underline{0}, 1\}$

note that time origin is specified by an underline

Select one:

- a. $\{1, 1, \underline{1}, 2, -2, 3, 4\}$
- b. $\{4, 3, \underline{1}, 1, 1, 2, -2\}$
- c. $\{1, 1, \underline{1}, -2, 2, 3, 4\}$
- d. $\{\underline{1}, 1, 1, 1\}$

[Clear my choice](#)

Question 17

Not yet answered

Check whether the following system is: static, causal, linear and time invariant

$$y(n) = x(n) \cdot x(n - 2)$$

Select one:

- a. dynamic, linear, non-causal, time variant
- b. dynamic, nonlinear, non-causal, time variant
- c. static, linear, causal, time variant
- d. dynamic, nonlinear, causal, time invariant

[Clear my choice](#)

Question 18

Not yet answered

Consider a system with an input $x[n]$ and an output $y[n]$ defined by

$$y(n) = \sum_{k=n-5}^{n+5} x(k)$$

That the system is characterized as:

Select one:

- a. Nonlinear, time-variant, causal
- b. Linear, Time-variant, causal
- c. Nonlinear, Time-variant, non-causal
- d. Linear, Time-invariant, non-Causal

[Clear my choice](#)

Question 19

Not yet answered

The energy E and power P of the following signal are

$$x(n) = u(n) - u(n - 6)$$

Select one:

- a. $E = 6$ joule and $P = 0$ watt
- b. $E = 9$ joule and $P = 0$ watt
- c. $E = 12$ joule and $P = 0$
- d. $E = \infty$ and $P = 6$ watt

[Clear my choice](#)

Question 20

Not yet answered

Evaluate the following expression

$$\sum_{n=-\infty}^{\infty} \delta(n-2) \cdot \cos(3n)$$

Select one:

- a. $\sum_{n=-\infty}^{\infty} \cos(2)$
- b. $\cos(6)$
- c. $\cos(3)$
- d. $\sum_{n=-\infty}^{\infty} \cos(6)$

[Clear my choice](#)**Question 21**

Not yet answered

Evaluate the following expression

$$\sum_{n=-\infty}^{\infty} e^{n^2} \cdot \delta(n-2)$$

Select one:

- a. e^2
- b. $\sum_{n=-\infty}^{\infty} e^4$
- c. e^4
- d. $\sum_{n=-\infty}^{\infty} e^{-4}$

[Clear my choice](#)**Question 22**

Not yet answered

The following sequence is equivalent to

$$x(n) = u(n+2) \cdot u(-n+3)$$

Select one:

- a. $x(n) = 1 \text{ for } -3 \leq n \leq 2$
- b. $x(n) = 1 \text{ for } -3 \leq n \leq -2$
- c. $x(n) = 1 \text{ for } -2 \leq n \leq 3$
- d. $x(n) = 1 \text{ for } 2 \leq n \leq 3$

[Clear my choice](#)

Question 23

Not yet answered

Find the zero input response (y_{zi}) of the following system:

$$y[n] - y[n-1] - 2y[n-2] = x[n] \text{ and } y[-1] = 1; y[-2] = 0$$

Select one:

- a. $Y[n] = 1/3 (-1)^n - 4/3 (2)^n$
- b. $Y[n] = -1/3 (-1)^n - 4/3 (2)^n$
- c. $Y[n] = -1/3 (-1)^n + 4/3 (2)^n$
- d. $Y[n] = -1/2 (-1)^n - 4/6 (2)^n$

[Clear my choice](#)

Question 24

Not yet answered

A second-order recursive system is described by the following difference equation

$$y[n] + 5y[n-1] + 4y[n-2] = x[n] \text{ where } y[-1]=2 \text{ and } y[-2]=1$$

Find the system response (total solution) for $x[n]=4u[n]$

Select one:

- a. $C_1(4)^n + C_2(-1)^n$
- b. $C_1(4)^n + C_2(1)^n + 0.4u[n]$
- c. $C_1(-4)^n + C_2(-1)^n + 0.4u[n]$
- d. $C_1(-4)^n + C_2(-1)^n + 4u[n]$

[Clear my choice](#)

Question 25

Not yet answered

A discrete-time system is governed by the following difference equation:

$$y(n) + y(n-1) - 2y(n-2) = x(n)$$

Find the expression of the impulse response $h(n)$ in a compact form.

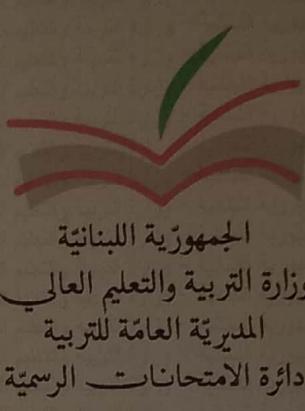
Select one:

- a. $h(n) = [3 - (2)^n]u(n)$
- b. $h(n) = [3 + (-2)^n]u(n)$
- c. $h(n) = [\frac{1}{3} - \frac{2}{3}(2)^n]u(n)$
- d. $h(n) = [\frac{1}{3} + \frac{2}{3}(-2)^n]u(n)$

[Clear my choice](#)

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رقم الترشيح: ٢٠٣٨٤



إفادة نجاح
في امتحانات

شهادة الثانوية العامة
فرع العلوم العامة

رقم الشهادة: ٤٢٩٢

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قد فازت في امتحانات شهادة الثانوية العامة، فرع العلوم العامة، لدورة ٢٠٢١ العادلة
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