

SS_IAT_1

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CLASS AND SECTION

4. CLASS AND SECTION *

Questions

5. A discrete signal is said to be even or symmetric if $x(-n)$ is equal to * 1 point

Mark only one oval.

$x(n)$

0

$-x(n)$

$-x(-n)$

6. The type of systems which are characterized by input and the output quantized at certain levels are called as * 1 point

Mark only one oval.

analog

discrete

digital

continuous

7. Which among the following are the stable discrete time systems? 1. $y(n) = x(4n)$ 2. $y(n) = x(-n)$ 3. $y(n) = ax(n) + 8$ 4. $y(n) = \cos x(n)$ 2 points

Mark only one oval.

1 & 3

2 & 4

1, 3 & 4

1, 2, 3 & 4

8. A signal is a power signal when the signal has *

1 point

Mark only one oval.

- Infinite average power
- finite average power
- Zero average power
- None Of The Above

9. A system which is linear is said to obey the rules of *

1 point

Mark only one oval.

- a) scaling
- b) additivity
- c) both scaling and additivity
- d) homogeneity

10. The system $y(t) = x(t) + 2x(t + 3)$ is *

1 point

Mark only one oval.

- causal system
- non-causal system
- partly (a) and partly (b)
- none of these

11. A system is said to be stable if the bounded input to the system produces * 1 point

Mark only one oval.

- Bounded output
- Non bounded output
- Inbound output
- Outbound output

12. A time invariant system is a system whose output * 1 point

Mark only one oval.

- a) increases with a delay in input
- b) decreases with a delay in input
- c) remains same with a delay in input
- d) vanishes with a delay in input

13. All real time systems concerned with the concept of causality are * 1 point

Mark only one oval.

- a) non causal
- b) causal
- c) neither causal nor non causal
- d) memoryless

14. A system is defined as *

1 point

Mark only one oval.

- A. Any combination of components or elements that has a useful function.
- B. Any combination of elements that has a single input and a single output.
- C. Any closed volume for which all the inputs and outputs are known.
- D. Any physical quantity that varies with time, space or any other independent variable

15. The continuous time system described by the equation $y(t) = x(t^2)$ comes under which category *

1 point

Mark only one oval.

- A. causal
- B. linear and time varying
- C. non causal, non-linear and time-invariant
- D. non causal, linear and time-variant

16. When $x(t)$ is said to be non periodic signal? *

1 point

Mark only one oval.

- a) If the equation $x(t) = x(t + T)$ is satisfied for all values of T
- b) If the equation $x(t) = x(t + T)$ is satisfied for only one value of T
- c) If the equation $x(t) = x(t + T)$ is satisfied for no values of T
- d) If the equation $x(t) = x(t + T)$ is satisfied for only odd values of T

17. Which one of the following is not a characteristic of a deterministic signal? * 1 point

Mark only one oval.

- a) Exhibits no uncertainty
- b) Instantaneous value can be accurately predicted
- c) Exhibits uncertainty
- d) Can be represented by a mathematical equation

18. Sum of two periodic signals is a periodic signal when the ratio of their time periods is _____ * 1 point

Mark only one oval.

- a) A rational number
- b) An irrational number
- c) A complex number
- d) An integer

19. Determine the odd component of the signal: $x(t) = \cos t + \sin t$. * 2 points

Mark only one oval.

- a) $\sin t$
- b) $2\sin t$
- c) $\cos t$
- d) $2\cos t$

20. The system $y[n]=ax(n)+b$ is non linear,stable,causal and time in variant 4 points

Mark only one oval.

- True
 False

21. Is the following signal an energy signal? $x(t) = u(t) - u(t - 1)$ * 2 points

Mark only one oval.

- a) YES
 b) NO

22. Which of the following is an example of amplitude scaling? * 1 point

Mark only one oval.

- a) Electronic amplifier
 b) Electronic attenuator
 c) Both amplifier and attenuator
 d) Adder

23. Power signal is non periodic and energy signal is periodic 1 point

Mark only one oval.

- True
 False

24. The signal $x(t)=3\cos t+4\cos(t/3)$ is periodic

2 points

Mark only one oval.

True

False

25. Resistor performs amplitude scaling when $x(t)$ is voltage, a is resistance and $y(t)$ is output current. *

1 point

Mark only one oval.

a) True

b) False

26. Which of the passive component performs differentiation operation? *

1 point

Mark only one oval.

a) Resistor

b) Capacitor

c) Inductor

d) Amplifier

27. which of the following statements are true? (a)an LTI system is always stable 1 point
 (b)an LTI system is stable only if the integral of its impulse response is finite.
 (c) in a system,if the input is bounded then the output is always bounded
 (d)in a system,even if the input is unbounded the output can be bounded *

Mark only one oval.

- b only
 b and d only
 c only
 a and d only

28. If $x(t)$ is a even signal and $y(t)$ is a odd signal,and $w(t)=x(t)+y(t)$, $z(t)=x(t)*y(t)$ 1 point
 then $w(t)$ and $z(t)$ are respectively *

Mark only one oval.

- even;odd
 odd;even
 neither;odd
 neither;even

29. The fundamental period of $x(t)$ is * 2 points

$$x(t) = \cos\left(\frac{\pi}{3}t\right) + \sin\left(\frac{\pi}{4}t\right),$$

Mark only one oval.

- 12 sec
 15 sec
 10 sec
 6 sec

30. Evaluate all properties of the system $y(t)=x(t)\cos(100\pi t)$ [type the answer} 5 points

31. If $x(t)$ is a signal and $y(t)=x(-t)$, then the given system is * 4 points

Mark only one oval.

- Linear,time variant,causal and Stable
- Non linear,time invariant,Non causal and Unstable
- Linear,Time variant,Non causal and stable
- Non Linear,time invariant,causal and Unstable

32. Which one is a linear system? * 2 points

Mark only one oval.

- $y[n] = x[n] * x[n - 1]$
- $y[n] = x[n] * x[n]$

33. Relation between $x[n]$ and $y[n]$ is

2 points

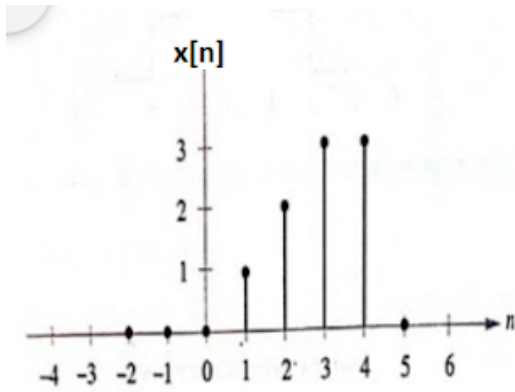


Fig 1

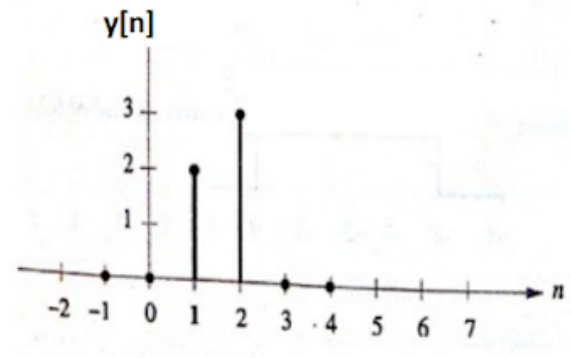


Fig 2

Mark only one oval.

- $y[n]=x[-n]$
- $y[n]=x[2n]$
- $y[n]=x[n-2]$
- $y[n]=x[2-n]$

34. Given the conditions *

4 points

A trapezoidal pulse, $x(t)$ defined by

$$x(t) = \begin{cases} 5 - t, & 4 \leq t \leq 5 \\ 1, & -4 \leq t \leq 4 \\ t + 5, & -5 \leq t \leq -4 \\ 0, & \text{otherwise} \end{cases}$$

is applied to a differentiator having the input-output relation: $y(t) = \frac{dx(t)}{dt}$. Find energy of the signal $y(t)$.

Mark only one oval.

- 10 J
- 5J
- infinity
- 2 J

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