GOVT. POLYTECHNIC CHAPRA
ASSIGNMENT QUESTIONS

SUBJECT: - SIGNAL & SYSTEM (1621604) **SEMESTER-VIth**

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1. Define Separately the terms "Signal and System" .

2. Explain types of Signals in details.

3. What is a Continuous time signal ?

4. What is Discrete time signal ?

5. Differentiate between continuous time signal & discrete time signal .

6. Define the term linear and non linear System ?

7. Define the term linear time invariant signal ?

8. Determine whether the following systems are time invariant or not ?

   (a) $y(t) = \sin x(t)$

   (b) $y(t) = x(t)$

9. Define Random signal ?

10. Define the terms: (a) Sinusoidal signal.

    (b) Unit Step function.

    (c) Unit impulse function.

    (d) Ramp function.

11. Define Causal and Non causal System ?

12. Differentiate between causal and non causal system.

13. Check the Linearity and Causality of the following system :

    (a) $y(t) = 2x(t)+3$ (b) $y(t) = x^2(t)$ (c) $y(t) = x(at)$

    (d) $y(t) = x(-at)$ (e) $y(t) = \sin t\, x(t)$ (f) $y(t) = x(t^2)$

14. Differentiate between Energy and power signal.

15. What do you meant by Fourier series.

16. Write the trigonometric form of the Fourier series representation of a periodic signal.

17. Explain types of Fourier series in details .

18. Write the exponential form of Fourier series.
19. Write down the symmetry conditions for the Fourier series function.
20. What is Fourier integral ?
21. Write the Dirichlet's conditions for Fourier series.
22. Explain Even and Odd functions.
23. Define the term Fourier Transform ?
24. What is the difference between Laplace Transform and Fourier Transform.
25. Explain different properties of Fourier Transform.
26. Explain Linearity & time scaling properties of Fourier Transform.
27. Write the properties of Continuous time Fourier series (CTFS).
28. Write Symmetric properties of Fourier Series.
29. Write down condition for existence of Fourier Transform.
30. Find the Fourier Transform (F.T) of a single sided exponential function e^{-at} u(t). where u(t) is unit step function.
31. Find the F.T of an impulse function x(t) = δ(t). Also draw its expectrum.
32. Find the F.T of signal x(t) = e^{-bltl} coswt.
33. Define Laplace Transform of a function.
34. What do you meant by Region of Convergence for Laplace Transform.
35. Discuss important properties of Laplace Transform.
36. Define unilateral or one sided Laplace Transform.
37. What is inverse Laplace transform.
38. Discuss important applications of Laplace Transform and inverse L.T .
39. Give the Statement for the following theorem of L.T

    (a) Initial value theorem. (b) Final value theorem.
40. Determine the L.T of following functions:

    (a) $f(t) = e^{-at}$ (b) $f(t) = e^{-5t}$ (c) $f(t) = \delta(t)$

    (d) $f(t) = e^{-t} \sin 5t$ (e) $f(t) = \sin wt$ (f) $f(t) = \cos wt$

    (g) f(t) = u(t)

41. Find inverse L.T of functions: (a) $L(S) = (S-1)/S\,(S+1)$

    (b) $L(S) = (S-1)/(S+1)(S^2+2S+5)$

42. Find the initial value of the L.T $X(S) = (2S+1)/(S^2-1)$.

43. Define Z-Transform ?

44. Discuss important properties of Z- Transform.

45. Explain Shifting properties of Z- Transform.

46. Define inverse Z-Transform.

47. Explain the initial and final value theorem of Z-Transform.

48. Define Region of convergence of Z-Transform.

49. Find the Z-Transform of function : (a) $x(n) = \delta(n)$. (b) $x(n) = u(n)$. (c) $x(n) = u(-n)$.

50. A discrete time signal is expressed as $x(n) = \delta(n+1) + 2\delta(n) + 5\delta(n-3) - 2\delta(n-4)$. find its Z-T.

51. Determine Z.T of the following signals : (a) $x(n) = a^n u(n-1)$

    (b) $x(n) = a^n u(-n-1)$

    (c) $x(n) = 2^n u(-n)$

52. If $X_1(n) = (\underline{1}, 2, 3, 4, 0, 1)$ using the time shifting property find Z. Transform of $X_2(n) = (1, 2, \underline{3}, 4, 0, 1)$.

53. Find transfer function.

54. Discuss Mason's Gain formula for finding Transfer function of a system.