UNIT II ANALYSIS OF CONTINUOUS TIME SIGNALS AND SYSTEMS

PART-A (2 Marks)

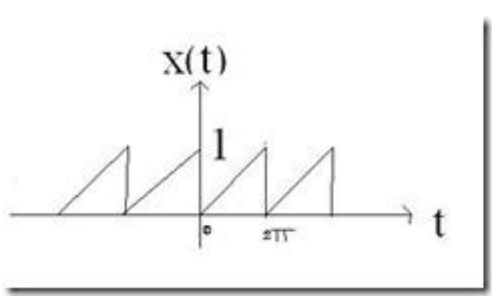
1. Define continuous time system.
2. Define Fourier transform pair.
3. Write short notes on dirichlets conditions for fourier transform.
4. Explain how aperiodic signals can be represented by fourier transform.
5. State convolution property in relation to fourier transform.
6. State parseval's relation for continuous time fourier transform.
7. What is the use of Laplace transform?
8. What are the types of laplace transform?
9. Define Bilateral and unilateral laplace transform.
10. Define inverse laplace transform.
11. State the linearity property for laplace transform.
12. State the time shifting property for laplace transform.
13. Region of convergence of the laplace transform.
14. What is pole zero plot.
15. State initial value theorem and final value theorem for laplace transform.
16. State Convolution property.
17. Define a causal system.
18. What is meant by linear system?
19. Define time invariant system.
20. Define stable system?
21. Define memory and memoryless system.
22. Define invertible system.
23. What is superposition property?
24. Find the fourier transform of $x(t)=\cos(\Omega_0 t)$

PART-B

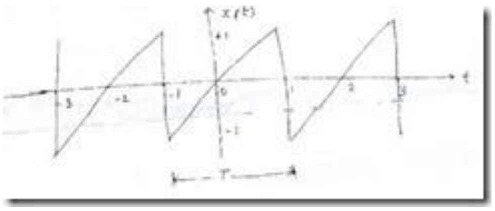
1. Find the inverse laplace transform of X(S) = S / S^2+5S+6

2. Find the fourier transform of a rectangular pulse of duration T and amplitude A

3. Obtain the cosine fourier series representation of x(t)

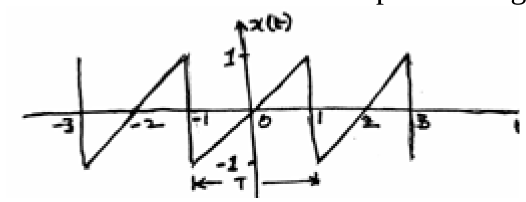


4. Find the trigonometric fourier series of the figure shown below



5. Find the laplace transform of the signal x (t) = e^{at} u(t) + e^{bt} u(t)

6.(i) Find the trigonometric fourier series for the periodic signal x(t) shown in fig., (16)



7. (i) Find the fourier transform of x(t)= $e^{-|t|}$ for $-1 \leq t \leq 1$, 0 otherwise. (8)
   (ii) Find the Laplace transform for (i) x(t) = u(t-2) (ii) x(t) = $t^2 e^{-2t}$ u(t) (8)

8. Explain and prove the properties of Laplace transform (16)

9. a) Compute the Laplace transform of x(t)=$e^{-b|t|}$ of the cases of b<0 and b>0. (10)
   b) State and prove Parseval's theorem of Fourier transform. (6)

10. a) Determine the fourier series representation of the half wave rectifier output. (10)

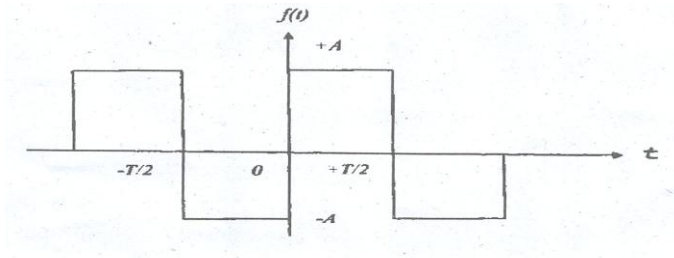
   b) Write the properties of ROC of Laplace transform. (6)

11. a) prove the scaling and time shifting properties of Laplace transform. (8)
   b) Determine the Laplace transform of x(t)= $e^{-at}\cos\Omega t$ u(t). (8)

12.a) Find the Fourier transform of rectangular pulse. Sketch the signal and its Fourier transform (8)
   b) Find the Fourier transform of a triangular pulse. (8)

13. i) State Dirichlet's conditions. Also explain its importance. (6)

) Obtain the exponential fourier series of the waveform. (10)



14. a) Find the Laplace transform of the signal $x(t)= e^{-at} \sin\Omega t$. (8)

b) Find the inverse Fourier transform of the rectangular spectrum give by

$$X(j\Omega) = \begin{cases} 1, -W < \omega < W \\ 0, |\omega| > W \end{cases}$$ (8)

15. a)Find the inverse Laplace transform of the following

i) $X(s) = \frac{s}{s^2+10s+25}$ (8)

ii) $X(s) = \frac{3s^2+8s+6}{(s+2)(s^2+2s+1)}$ (8)