ST. ANNE'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

(An ISO 9001:2015 Certified Institution)

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QUESTION BANK

PERIOD: JULY - NOV 2018 **BATCH**: 2017 – 2021

BRANCH: ECE **YEAR/SEM:** II/III

SUB CODE/NAME: - EC8352 SIGNALS AND SYSTEMS

UNIT I CLASSIFICATION OF SIGNALS AND SYSTEMS

PART – A

1. Find the summation. $X(n) = \Sigma\, \delta(n-1) \sin 2n$ **[ID][Apr/May-2017]**
2. Define a linear system. **[D][Apr/May-2017]**
3. Determine if the signal x[n] given below is periodic. If yes, give its fundamental period. If not, state why it is aperiodic. $X(n) = \sin[(6\pi/7)n+1]$ **[D][Nov/Dec-2017]**
4. Check whether the following system is Time Invariant/Time variant and also causal/non causal: $Y(t) = x(t/3)$ **[D][Nov/Dec-2017].**
5. Sketch the following signals: rect [(t+1)/4]; 5 ramp (0.1t)? **[ID][May/Jun-2016].**
6. Given $g(n) = 2e^{-2n-3}$. Write out and simplify the functions:
   i) g (2-n) ii) g(n/2 +4) . **[ID][May/Jun-2016]**
7. Give the mathematical and graphical representation of a continuous time and discrete time unit impulse functions? **[D] [Nov/Dec-2016].**
8. State the difference between causal and non causal system. **[D][Nov/Dec-2016]**
9. Sketch the following signals
   1) x(t) = 2t for all t
   ii) 2) x (n) = 2n-3, for all n **[ID][May/Jun-2014].**
10. Given x (n) = {1,-4, 3, 1, 5, 2}.Represent x(n) in terms of weighted Shifted impulse functions. **[D][May/Jun-2014].**
11. Give the mathematical and graphical representation of continuous and discrete time unit impulse function. **[D] [Nov/Dec-2013].**
12. What are the conditions for the system to be LTI system? **[D] [Nov/Dec-2013].**
13. Define random signal?
14. Verify whether the following signal is energy or power signal. And calculate its energy or power: $X(t) = e^{-2t} u(t)$ **[D] [Nov/Dec-2012].**
15. Check whether the following system is static or dynamic and also causal or non casual: Y(n) = x (2n) **[D] [Nov/Dec-2012].**
16. Verify whether the system described by the equation is linear and time invariant: $V(t) = x(t^2)$ **[D][May/Jun-2012].**
17. Find the fundamental period of given signal: $x(n) = \sin((6\pi n/7)+1)$ **[D][May/Jun-2012].**
18. State the properties of LTI System? **[D] [Nov/Dec-2011].**
19. Draw the function $\pi(2t+3)$ when $\pi(t) = \{1, \ -1/2<t<1/2$ and 0 otherwise$\}$ **[D] [Nov/Dec-2011].**
20. Prove that $\delta(n) = u(n) - u(n-1)$. **[D] [Nov/Dec-2010].**
21. Check for periodicity of $\cos(0.01\,\pi n)$ **[D] [Nov/Dec-2010].**
22. Define unit impulse and unit step signals? **[D][May/Jun-2010].**

23. When is a system said to be memory less? Give an example? **[D][May/Jun-2010].**
24. Plot the signal x[n] = u[n] - u[n - 4]. **[D][Apr/May-2017] (Reg 2008)**
25. Determine whether the signal x(t) = cos (π/2) t is periodic or not. Also find its period if it is periodic. **[D][Apr/May-2017] (Reg 2008)**
26. Define random signals. **[D] [May/Jun-2016] (Reg 2008)**
27. What are the different types of representation of discrete -time signals? **[D] [May/Jun-2016] (Reg 2008)**
28. Define power signal. **[D][Nov/Dec-2015] (Reg 2008)**
29. Given x(n)={1,2, , 3 , - 4,6} Plot the signal x [n-1] . **[D][Nov/Dec-2015] (Reg 2008)**
30. State two properties of unit impulse function. **[D][Nov/Dec-2014] (Reg 2008)**
31. Draw the following signals :

    (a) u(t) -u(t -10)

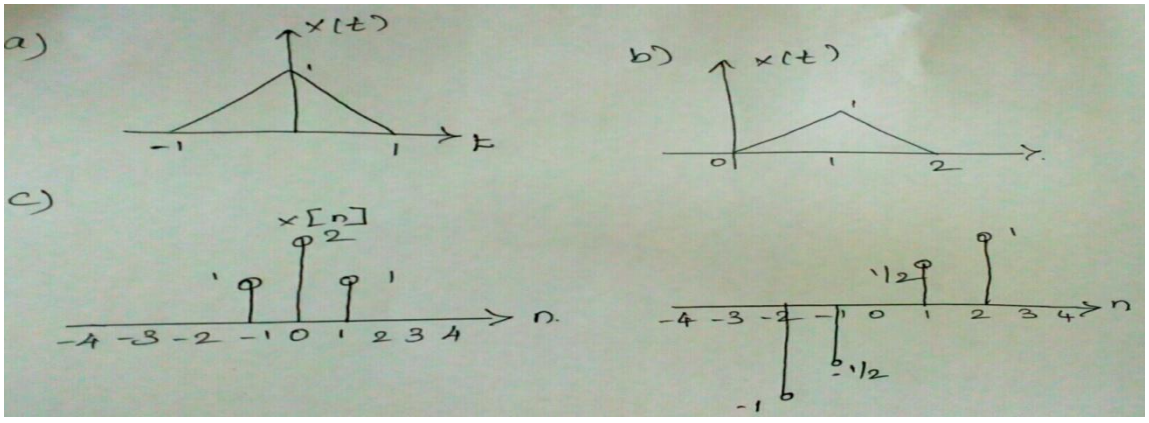
    (b) (1/2)" u (n- 1). **[D][Nov/Dec-2014] (Reg 2008)**

PART – B

[First Half]

[Standard signals- Step, Ramp, Pulse, Impulse, Real and complex exponentials and Sinusoids_ Classification of signals – Continuous time (CT) and Discrete Time (DT) signals, Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals]

1. Find out whether the following signals are periodic or not. If periodic find the period
2. X (t) = 2 cos (l0t + 1) - sin (4t -1), x (n) =cos (0.1πn). (8) **[D][Apr/May-2017]**
3. Find out whether the following signals are energy or power signal or neither power nor energy as the case may be for the signal. X (t) = u (t) +5 u (t-1) – 2u (t-2) (7) **[D][Apr/May-2017]**
4. Find the whether the signal is an energy signal or power signal.
   i) X (t) = e^{-2t} u (t). (5)
   ii) Draw the waveform for the signal x(t) = r(t) - 2r(t -1) + r(t - 2). (4)
   iii) For the given signal determine whether it is even, odd, or neither



(4) **[ID][Nov/Dec-2017]**

5. Find whether the following signals are periodic or aperiodic. If periodic find the fundamental period and fundamental frequency. $X_1(n)$ = sin 2πt + cos πt, $x_2(n)$ = sin (nπ/3). Cos (nπ/5).(8) **[D] [May/Jun-2016].**
6. Find whether the following signals are energy and power signals. Determine energy and power signals:
7. G (t) = 5 cos (17πt+ π/4) + 2 sin (19πt+π/3) , g(n) = $(0.5)^n$ u(n) (7) **[D] [May/Jun-2016].**
8. Determine whether the system is Linear, Time Invariant, Causal and memory less: y() = $1/2\int_{-\infty}^{t} x(z)dz$ (13) **[ID][Nov/Dec-2016]**
9. Sketch i) x (t) ii) x(t+1) iii) x(2t) iv) x(t/2) for following signal: given x(t) = 1/6(t+2), -2 ≤ t ≤ 4

   i. 0, otherwise (7) **[D][May/Jun-2014].**

10. Determine whether the discrete time sequence is periodic or not.
    1. $X(n) = \sin[(3\pi/7)n + \pi/4] + \cos(\pi/3)n$ (6) **[D][May/Jun-2014].**
11. Determine whether the signals $x(t) = \sin 20\pi t + \sin 5\pi t$ is periodic and if it is periodic find the fundamental period? **(7) [D][Nov/Dec-2013]**
12. Define energy and power signals. Find whether the signal $x(n)=(\frac{1}{2})^n u(n)$ is energy or power signal and calculate their energy and power. **(6) [D][Nov/Dec-2013]**
13. Discuss various forms of real and complex exponential signals with graphical representation.**(6) [D][Nov/Dec-2013]**
14. Define energy and power signals? **(4) [D][May/Jun-2013].**
15. Determine whether the following signal are energy and power and calculate their power and energy i) $x(n)=(\frac{1}{2})^n u(n)$ ii) $x(n) = \text{rect}(t/T_0)$ iii) $x(n) = \cos^2(\omega_0 n)$. **(7) [ID][May/Jun-2013].**
16. Define unit step, ramp, pulse, impulse and exponential signals. Obtain the relationship between unit step and unit ramp function. **(7) [ID][May/Jun-2013].**
17. How are the signals classified? Explain? **(7) [D][Nov/Dec-2012]**
18. Give the equations and draw the waveforms of discrete time real and complex exponential signals.**(6) [D]**
19. Explain all classification DT signals with example for each category. **(7) [D][Nov/Dec-2011]**
20. If $x(n)=\{0,2,-1,0,\underset{\uparrow}{2},1,1,0,-1\}$ what is x(n-3) and x(1-n) **(7) [D][Nov/Dec-2010]**
21. Compare energy and power signal? **(4) [D][Nov/Dec-2010]**
22. Determine whether $x(t) = \text{rect}(t/10)\cos\omega_0 t$ is energy or power signal. **(4) [D]**
23. Derive the relationship between unit step and delta function. **(4) [ID]**
24. Distinguish between following: i) continuous and discrete time signal ii) unit step and unit ramp function iii) periodic and aperiodic signals iv) Deterministic and random signals. **(7)[D][Apr/May-2010]**
25. Find whether the signals $x(t) = 2\cos(10t+1) - \sin(4t-1)$ is periodic or not. **(6) [D][Apr/May- 2010]**
26. Explain the properties of unit impulse function. **(4)[D][Apr/May- 2010]**
27. Find the fundamental period of following continuous signal $x(t) = 20\cos(10\pi t+(\pi/6))$. **(6)[D][Apr/May- 2010]**

[Second Half]

[Classification of systems- CT systems and DT systems- – Linear & Nonlinear, Time-variant & Time-invariant, Causal & Non-causal, Stable & Unstable.]

1. Determine the properties viz linearity, causality, time invariance and dynamicity of the given systems**.**
   i) $y(t) = d^2y/dt^2 + 3t\,dy/dt + y(t) = x(t)$
   ii) $y_1(n) = x(n^2) + x(n)$
   iii) $y_2(n) = \log_{10} x(n)$ **(13) [D][Apr/May-2017]**

2. Determine whether the following system is Liner and Causal. i) $y(n) = x(n).\,x(n-1)$ and $y(n) = (1/3)[x(n-1)+ x(n) + x(n+1)]$ (5)
3. For x() indicate in figure sketch the following:
   a) $X(1-t)[u(t+1) - u(t-2)]$ (4)
   b) $X(1-t)[u(t+1) - u(2-3t)]$ (4) **[ID][Nov/Dec-2017]**
4. Find whether the following systems are time variant or fixed. Also find whether the systems are linear or nonlinear : i) $d^3y(t)/dt^3 + 4\,d^2y(t)/dt^2 + 5\,dy/dt + y^2t = x(t)$
   ii) $y(n) = an^2\,x(n) + bn\,x(n-2)$ (13) **[D] [May/Jun-2016]**
5. Sketch the following signals:
   i) $u(-t+2)$
   ii) $r(-t+3)$
   iii) $2\delta[n+2] + \delta[n]-2\delta[n-1]+3\,\delta[n-3$
   iv) $u[n+2]]\,u\,[-n+3]$

where u(t), r(t) , g[n], u[n] represent continuous time unit step, continuous time ramp, discrete time impulse and discrete time step functions respectively. (13) **[D][Nov/Dec-2016].**

6. Check the following systems are linear, stable i) $y(t) = e^{x(t)}$ ii) $y(n) = x(n-1)$ (13) **[D][May/Jun-2014].** Determine whether the discrete time system $y(n) = \cos(\omega n)$ is i) memory less ii) stable iii) causal iv) linear v) time invariant. **(7) [D][Nov/Dec- 2013].**
7. Define LTI system. List the properties of LTI system. Explain? **(7)[D][Nov/Dec- 2012].**
8. Determine whether the systems described by the following input – output equations are linear, dynamic, causal and time variant: i) $y_1(t) = x(t-3) + (3-t)$ ii) $y_2(t) = dx(t)/dt$ iii) $y_1(n) = n\,x[n] + b\,x_2[n]$ iv) even {x[n-1]}. **(7)[D][May/Jun- 2012].**
9. A discrete time system is given as $y(n) = y^2(n-1) = x(n)$. A bounded input of $x(n) = 2\,\delta(n)$ is applied to the system. Assume that the system is initially relaxed. Check whether system is stable or unstable. **(7)[D][May/Jun- 2012].**
10. Find out whether the following systems are i) $y(n) = x(n) + (1/x(n-1))$ ii) $d^3y(t)/dt^3 + 4\,d^2y(t)/dt^2 + 5\,dy(t)/dt = 2\,y^2(t) = x(t)$ i) linear or non- linear ii) causal or non –causal iii) time variant or invariant iv) stable or unstable. **(7)[D][Nov/Dec- 2011].**
11. Find out whether the following system $y(n) = x(n^2)$is linear or non- linear ii) causal or non –causal iii) time variant or invariant iv) stable or unstable. **(7)[D][Nov/Dec- 2010].**

UNIT 2 ANALYSIS OF CONTINUOUS TIME SIGNALS

PART A

1. What is the condition for the existence of Fourier serious for a signal? **[D][Apr/May 2017]**
2. State Parseval's theorem for a continuous time aperiodic signal. **[D][Apr/May 2017]**
3. Find the Fourier transform of $x(t) = e^{-at}\,u(t)$. **[D] [Nov/Dec -2017].**
4. Will there be two different signals having same Laplace transform? Give an example. How do you differentiate these two signals? **[ID] [Nov/Dec -2017].**
5. Define region of convergence of Laplace Transform for a causal signal. **[D][Apr/May 2017] (2008 reg)**
6. Find the Fourier series representation of the signal $x(t) = \cos 2\pi t/3$ and determine the Fourier series coefficients. **[D] [Nov/Dec -2016].**
7. Find the Laplace transform of $x(t) = e^{-at}\,u(t)$. **[D] [Nov/Dec -2016].**
8. What is the inverse Fourier transform of i) $e^{-j2\pi fto}$ ii)$\delta(f-fo)$ [D] [**May/June 2016]**
9. Give the Laplace Transform of $x(t) = 3e^{-2t}\,u(t) - 2e^{-t}\,u(t)$ with ROC. [D] [**May/June 2016]**
10. State the conditions for the convergence of Fourier series representation of continuous time periodic signals. **[ID] [Nov/Dec -2014 & May/ Jun 2014].**

OR

11. State Dirichlet Conditions of Fourier series. **[D][Apr/May 2017] (2008 reg)**
12. Find the ROC of the Laplace transform of $x(t) = u(t)$. **[D] [Nov/Dec -2014].**
13. What is the inverse Fourier transform of i) $e^{-j2\pi ft0}$ ii) $\delta(f-f_0)$ **[D][May/Jun 2016]**
14. Give the Laplace Transform of x(t) = 3e-2t u(t) - 2e-t u(t) with ROC. **[D][May/Jun 2016]**
15. State equations for trigonometric Fourier serious. **[D] [Nov/Dec -2013].**
16. What is the relationship between Fourier Transform and Laplace Transform? [D] **[May/Jun 03,07 & Nov/Dec 10,15]**
17. State any two properties of ROC of laplace transform X (s) of a signal x(t). **[D][May/Jun 2014]**
18. State the time scaling property of Laplace transforms. **[D][May/Jun 2013]**
19. Give synthesis and analysis equations of continuous time Fourier transform. **[D] [Nov/Dec -2012].**
20. Define the region of convergence of the Laplace transform. **[D] [Nov/Dec -2012].**
21. Define Nyquist rate. **[D][May/Jun 2012]**

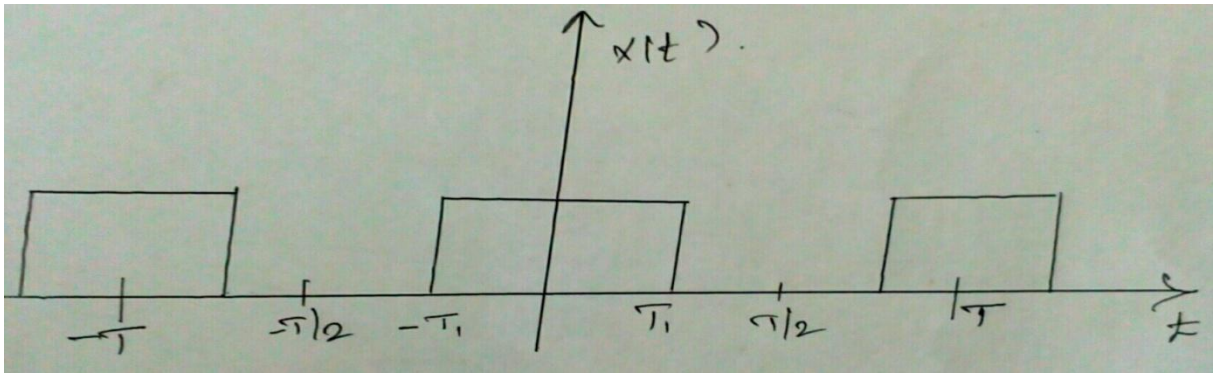
22. Determine the Fourier series coefficients for the signal cos (πt). **[D][May/Jun 2012]**
23. Determine the Laplace transform of the signal δ(t-5) and u(t-5). **[D][May/Jun 2011]**
24. Draw the single sided spectrum for x(t) = 7 + 10 cos (40πt + π/2)
25. What is the laplace transform of δ(t) and u (t)? **[D] [Nov/Dec -2011].**
26. Find the Fourier transform of x(t) = $e^{j2\pi ft}$. **[D] [Nov/Dec -2010].**
27. Give the relationship between Laplace transform and Fourier transform**. [D] [Nov/Dec -2010].**
28. State any two properties of Continuous – Time Fourier Transform. **[D][May/Jun 2010]**
29. Find the Laplace transform of the signal x (t) = e^{at} u (t). **[D][May/Jun 2010]**
30. What is the Fourier transform of a DC signal of amplitude 1? **[D][May/Jun 2013]**
31. Find the Laplace transform of the signal x (t) = e^{-at} sin (ωt)u (t). **[D][May/Jun 04,09& Nov/Dec 04]**
32. State the initial and final theorem of Laplace Transforms. **[D] [Nov/Dec -2005].**
33. Find Inverse Fourier Transform of X (jω) = $e^{-|\omega|}$ **[D][May/Jun 2011]**

PART B

[First Half]

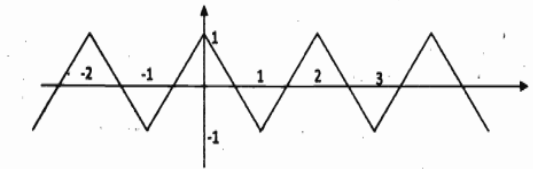
[Fourier series for periodic signals]

1. Obtain the Fourier co-efficient and write the Quadrature form of a fully rectified sine wave. (13) **[ID][Apr/May-2017]**
2. Determine the Fourier series coefficients of the following signal.



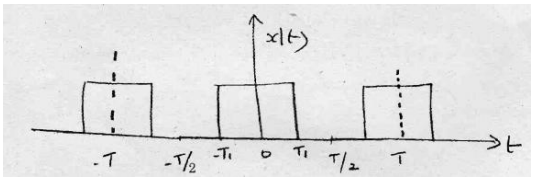
[ID][May/June- 2017]

3. (a) Obtain the Fourier series coefficients & Plot the spectrum for the given waveform



(13) **[ID][Apr/May -2016]**

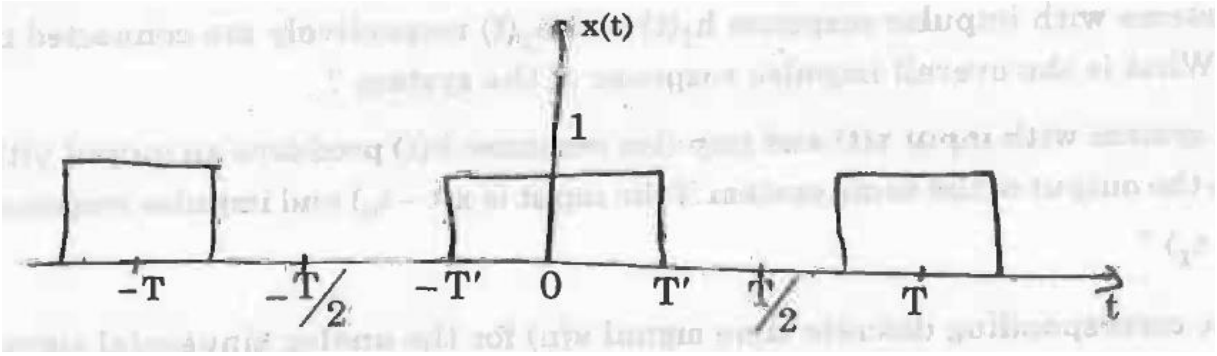
4. Find the Fourier series coefficients of the following signal :



Plot the spectrum of the signal. (13) [D][**Nov/Dec -2014]**

5. Find the complex exponential Fourier series coefficient of the signal x(t)= sin3πt + 2 cos 4πt. & X (t) =2+ cos (2π/3) t +4 sin (5π/3) t. (13) **[D][Apr/May -2012]**
6. Find the exponential Fourier series and plot the magnitude and phase spectrum for the saw tooth waveform. (13) **[D][Apr/May -2015]**

7. Find the Fourier series coefficients of the signal shown below.



Plot its magnitude and phase spectrum. (13) **[D][Apr/May -2015]**

Fourier Transform – properties

8. Find the Fourier transform of a rectangular pulse with width T and amplitude A. (6) **[D][May/June-2017]**
9. State and prove any four properties of Fourier transform? (13) [D][**Nov/Dec -2012]**
10. Determine the Fourier transform for double exponential pulse whose function is given by $x(t) = e^{-altl}$,a > 0 . Also draw its amplitude and phase spectra. (7) [D][**Nov/Dec -2017]**
11. Find the Fourier transform of the signal x (t) -= cos Ω_ot u(t). (13) [D][**Nov/Dec -2016]**
12. Find the spectrum of $x(t) = e^{-2|t|}$. Plot the spectrum of the signal. (13) [D][**Nov/Dec -2014]**
13. State and prove the, multiplication and convolution property of Fourier transform. (13) [D][**Nov/Dec -2016]**
14. From basic formula, determine the Fourier transform of the given signals. Obtain the magnitude and phase spectra of the given signals. te^{-at} u(t), a > 0

    $e^{-a|t|}$, a > 0 **(10) [ID][May/June- 2016]**

    (ii) State and prove Rayleigh's energy theorem. (6) **[D][May/June- 2016]**

15. Find the Fourier Transform of f(t) = t cos at. (8) [D][Apr/May-2017] (2008 Reg)

[Second Half]

[Laplace Transforms and properties]

1. Determine the inverse Laplace transform of the following) x(s) = 1-2s^2-14s/s(s+3) (s+4) ii) x(s) = 2s^2+ 10s +7 / (s+1)(s^2+3s+2). (6) **[D][Apr/May-2017]**
2. i) Find the Laplace transform of half wave rectifier with amplitude A overtime period 0 to π.
   ii) Find the inverse Laplace transform of F(s) = S-2/S$(S+1)^3$. (10) **[D][Apr/May-2017] (2008 Reg)**
3. Obtain the inverse Laplace transform of the function

   X(s) = 1/ (s2 + 3s+2), ROC: -2<Re{s}<-1 (6) [D][**Nov/Dec -2017]**

4. Find the inverse Laplace transform of X(S) = 8s + 10/(s+1)$(s-2)^3$. (10) **[D][Apr/May-2015]**
5. Find the inverse Laplace transform of X(S) = 1/s2 +3s +2, ROC: -2<Re (s)< -1 . (8) [D][**Nov/Dec -2012]**

UNIT III - LINEAR TIME INVARIANT - CONTINUOUS TIME SYSTEMS

PART A

1. Give the expression for convolution integral. [D] [**Apr/May -2017]**
2. Given h (t), what is the step response of a CT LTI system? [D] [**Apr/May -2017]**

3. Will there be two different signals having same Laplace transform? Give an example. How do you differentiate these two signals? [D][**Nov/Dec -2017]**
4. Consider an LTI system with transfer function H(s) is given by H(s) =1/ (s +1)(s + 3) Re(s)>3; determine h(t). [D][**Nov/Dec -2017]**
1. List the properties of Convolution Integral. [D][**Nov/Dec -2017] (reg 2008)**
2. Find whether the following system whose impulse response is given is causal and stable h (t) =e^{-2t} u(t-1). [D][**Nov/Dec -2017] (reg 2008)**
3. Find whether the following system whose impulse response is given is causal and stable h(t) = e-2t u(t - 1). **[D][May/June- 2016]**
4. Realize the block diagram representing the system H(s) = s/(s+1) **[D][May/June- 2016]**
5. Convolve the following signals u(t -1) and δ(t -1). **[D][Nov/ Dec- 2016] (reg 2008)**
6. Given H(S) =S / (S^2+2S+1). Find the differential equation representation of the system. **[D][Nov/ Dec- 2016] (reg 2008)**
7. Give the expression for convolution integral. **[D][Nov/ Dec- 2016]**
8. Convolve the following signals u (t-1) and δ (t-1). **AU DEC 2016 (reg 2008)**
9. State the condition for a continuous time system to be stable and causal. [D] [**Apr/May -2017]**
10. State the significance of impulse response. [D] [**Apr/May -2016]**
11. Realize the block diagram representing the system H(s) = s / s+1. [D] [**Apr/May -2017]**
12. Given h (t) , what is the step response of a CT -LTI system. [D] [**Apr/May -2017]**
13. Given H(s) = s/s^2+2s+1. Find the differential equation representing of the system. [D] [**Apr/May -2014]**
14. What is the transfer function of a system whose poles are at -0.3±j0.4 and a zero at -0.2? [D] [**Apr/May -2014]**
15. Given the differential equation representation of a system. D2/dt2 y(t) + 2 d/dt y(t) – 3 y(t) = 2 x(t). Find the frequency response H(jω). **[D][Nov/ Dec- 2015]**
16. What is u(t-2)*f(t-1)?where * represents convolution. **[D][Nov/ Dec- 2015]**
17. Find the differential equation relating the input and output a CT system represented by H(jω) = 4/[(jω)^2+8jω+4] [D] [**Apr/May -2014]**
18. State the necessary and sufficient condition for an LTI continuous time system to be causal. [D] [**Apr/May -2014]**
19. Draw the block diagram of the LTI system described by dy(t)/dt + y(t) = 0.1 x(t). **[D][Nov/ Dec- 2015]**
20. Find y(n) = x (n-1) * ô(n+2) **[D][Nov/ Dec- 2015]**
21. What is the condition for LTI system to be Stable? [D] [**Apr/May -2010]**
22. What is the impulse response of two LTI systems connected in parallel? [D] [**Apr/May -2010]**
23. Write the Nth order differential equation. **[D][Nov/ Dec- 2010]**
24. Determine the response of the system with impulse response h(t) = tu(t) for the input x(t) = u(t) **[D][Nov/ Dec- 2011]**
25. Find the impulse response of the system given by H(s) = 1/(s+9). **[D][Nov/ Dec- 2005]**
26. find the transfer function of LTI system described by the differential equation $d^2y(t)/dt^2$ + 3 dy(t)/dt +2 y(t) = 2 dx(t)/dt – 3 x(t). [D] [**Apr/May -2008]**
27. Write the N^{th} order differential equation. **[D][Nov/ Dec- 2010]**
28. Draw the block diagram of the LTI system described by dy(t)/dt + y(t) = 0.1x(t). **[D][Nov/ Dec- 2010]**
29. Find the differential equation relating the input and output a CT system represented by H(jω) = 4/(jω)^2+8jω+4. [D] [**Apr/May -2014]**
30. What is the transfer function of a system whose poles are at -0.3±j0.4 and a zero at -0.2? **[D][Nov/ Dec- 2004]**

PART –B

[First Half]

[Impulse response - Differential Equation]

1. A causal LTI system having a frequency response H (jΩ) = 1/ (jΩ+3) producing an output $y(t) = e^{-3t}u(t) - e^{-4t}u(t)$ for a particular input x(t). Determine x (t). (13) [D] [**Apr/May -2017]**
2. Realize the given system in parallel form $H(s) = s(s+2)/ (s^3+8s^2+9s+12)$ (13) [D] [**Apr/May -2017]**
3. Using Laplace transform of x(t). Give the pole -zero plot and find ROC of the signal x(t). $x(t) = e^{-b|t|}$ for both b>0 and b<0. (6) [D][**Nov/Dec -2017]**
4. Find the condition for which Fourier transform exists for x(t). Find the Laplace transform of x(t) and its ROC. $x(t) = e^{-at} u(-t)$. (7) [D][**Nov/Dec -2017]**
5. realize the following in indirect form II $d^3y(t)/dt^3+4d^2y(t)/dt^2+7dy(t)/dt + 8y(t) = 5 d^2x(t)/dt^2+ 4dx(t)dt+ 7 x(t)$ (6) **[D][May/June- 2016]**
6. An LTI system is defined by the differential equation $d^2y(t)/dt^2 - 4dy(t)/dt + 5y(t) = 5 x(t)$ Find the response of the system y(t) for an input x(t) = u (t), if the initial conditions are y(0) = 1; $(dy(t) / dt) \big|_{t=0} = 2$. (7) **[D][May/June- 2016]**
7. Determine frequency response and impulse response for the system described by the following differential equation. Assume zero initial conditions dy(t)/dt + 3y(t) = x(t) (6) **[D][May/June- 2016]**
8. A system is described by the differential equation $d^2y(t)/dt^2+6dy(t)/dt + 8y(t) = dx(t)dt + x(t)$. find the transfer function and output signal y(t) for x(t) = δ(t). (13) **[D][Nov/ Dec- 2016]**
9. The signal x(t)=u(t-3)-u(t-6) is fed through an LTI system with an impulse response $h(t)=e^{-3t}u(t)$.Determine the output response. (8)
10. Determine the output from the above system if the input is the derivative of above input x(t). (5)
11. The input and output of a causal LTI system described by the following differential equation d^2 y(t)/dt2 + 7 dy(t)/dt + 12 y(t) = 2 x(t).If the input x(t) to the LTI system is given by $x(t)=2e^{-2t}u(t)$, determine the response y(t). (7)
12. Realize the d2 y(t)/dt2 + 7 dy(t)/dt + 12 y(t) = 2 x(t).system using Direct Form I and Direct Form II. (6)
13. Find the block diagram representation of the system given by $d^3y(t)/dt^3+3d^2y(t)/dt^2+ 5dy(t)/dt+6y(t) = d^2x(t)/dt^2+ 6dx(t)/dt+5x(t)$. (7)
14. Draw the block diagram representation for $H(s) = (4s+28) / s^2 +6s+5$. (6)
15. Realize the given system in parallel form $H (s) = s(s+2)/ s^3+8s^2+19s+12$. (13)
16. A causal LTI system having a frequency response $H(j\Omega) = 1/j\Omega+3$ is producing an output $y(t) = e^{-3t}u(t) - e^{-4t} u(t)$ for a particular input x(t). Determine x(t). (13)
17. Realize the following direct form I, indirect form II $d^3y(t)/dt^3 +4 d^2y(t)/dt^2+ 7dy(t)/dt+8 y(t) = 5 d^2x(t)/dt^2+ 4dx(t)/dt+7x(t)$. (10)
18. Verify whether the following systems are BIBO stable, causal or not. $h(t) = 1/RC e^{-t}/RC$ for $t \geq 0$ and 0 for t<0.
19. A system is described by the differential equation $d^2y (t) /dt^2 +6 d/dt y (t) +8y (t) = d/dt x (t) + x (t)$. Find the transfer function and the output signal y (t) for x (t) = δ (t) (13)
20. Find the output of an LTI system with impulse response h (t) =δ (t-3) for the input x (t) =cos 4t + cos 7t.
21. Draw the direct form I & II structures for a CT-LTI system described by the differential equation 7 dy(t)/dt + 12 y(t) = dx(t)/dt + x(t). (6)

Convolution integrals

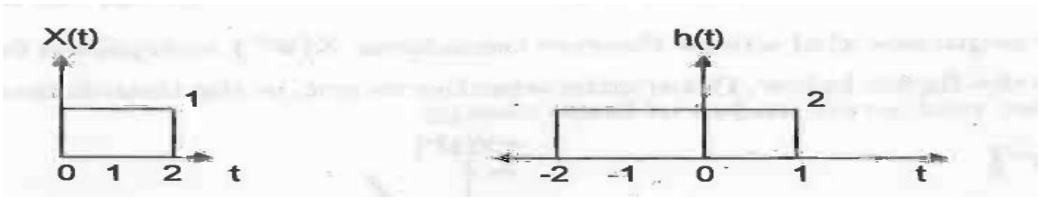
22. Using graphical method, find the output sequence y[n] of the LTI system whose response h [n] is given and input x[n] is given as follows.
    x[n] = {0.5, 2} ; h[n] = {1, 1, 1}. (6) [D][**Nov/Dec -2017]**
23. Convolve the following signals x(t) = e-3t u(t)

h(t) = u(t+3) (6)

24. Derive an expression for convolution integral. (6)
25. Convolve the following signals x(t) e^{-3t}u(t)

h(t)= u(t + 3) (13) **[D][Nov/ Dec- 2016]**

26. Find the response y(t) of an LTI system whose x(t) and h(t) are shown in fig. (Using convolution integral).



(7) [D][**Nov/Dec -2017]**

27. Using graphical convolution, find the response of the system whose impulse response is h(t) = e^{-2t}u(t) for an input x(t) = A, 0 ≤t≤2 ,

0 for otherwise (7) **[D][May/June- 2016]**

[Second Half]

[Fourier and Laplace transforms in Analysis of CT systems - Systems connected in series / parallel]

28. Solve the differential equation (D^2 +3D+2) y (t) =D x (t) using the input x (t) = 10e^{-3t} and with initial condition y (0^+) = 2 and y (0^+) =3. (7)
29. Using convolution, find the response of the system whose impulse response is h(t) = e-2t u(t) for an input x(t)= {A, for 0≤t≤2, 0 , otherwise (6)
30. For a LTI system with H(s) = (s+5) / (s 2 +4s+3) find the differential equation. Find the system output y (t) to the output x (t) = e -2t u (t). (7)
31. Determine the response of the system with impulse response h(t) = u(t) for the input x(t) = e^{-2t} u(t). (7)
32. The LTI system is described by d/dt y(t)+2y(t) = x(t). Obtain an output for the input of x (t)=e^{-t}u(t) using Fourier Transform. (6)
33. Solve the following differential equation, d2y(t)/dt +4 dy(t)/dt + 5y (t) = 5x(t) with y (0^-) = 1 and dy(t)/dt │0- = 2. And x(t) = u(t) (8)
34. Find the response y(t) of a continuous time system using Laplace transform with transfer function H(S) = 1/ (S+1)(S+2)for an input x(t)= e^{-t} u(t). **(15)[D][Nov/ Dec- 2016]**

UNIT- IV ANALYSIS OF DISCRETE TIME SIGNALS

PART A

1. What is the z transform of a unit step sequence? [D] [**Apr/May -2017]**
2. Find x (∞) f the signal for with the z -transform is given by X(Z) = (Z+1) / 3(Z-1)(Z+0.9) [D] [**Apr/May -2017]**
3. List the ROC properties of Laplace transform. [D][**Nov/Dec -2017]**
4. Find the Z transform of a sequence x[n] = cos (ωnT) u[n]. [D][**Nov/Dec -2017]**
5. Write the conditions for existence of DTFT. [D] [**May/ Jun -2016]**
6. Find the final value of the given signal x(z) = 1 / (1+2^{z-1}+3^{z-2}) [D] [**May/ Jun -2016]**
7. Find the Nyquist rate of the signal x(t) = sin 200πt - cos100πt [D][**Nov/Dec -2016]**
8. Find the Z -transform of the signal and its associated ROC x(n) = {2, -1, 3,0,2} [D][**Nov/Dec -2016]**
9. State sampling theorem. [D][**Nov/Dec -2017] (2008 reg)**
10. Find inverse z -transform for 1/ (z+0.1). [D][**Nov/Dec -2017] (2008 reg)**
11. Define Z - transform. [D][**Nov/Dec -2015] (2008 reg)**

12. State the relation between DTFT and Z - transform. [D][**Nov/Dec -2015] (2008 reg)**
13. Find the DTFT of x(n) = ô(n) + ô(n- 1) . [D][**Nov/Dec -2015] (2008 reg)**
14. State and prove the time folding property of z-transform. [D][**Nov/Dec -2015] (2008 reg)**
15. What is aliasing? [D][**Nov/Dec -2014] (2008 reg)**
16. Write a note on ROC. [D][**Nov/Dec -2014] (2008 reg)**
17. What is an anti-aliasing filter? [D] [**May/ Jun -2014]**
18. State the multiplication property of DTFT? [D] [**May/ Jun -2014]**
19. What is aliasing? D][**Nov/Dec -2013] (2008 reg)**
20. What is unilateral and bilateral Z Transform? [D][**Nov/Dec -2013] (2008 reg)**
21. What is the transform of (n+k)?
22. Define DTFT and inverse DTFT. [D][**Nov/Dec -2013] (2008 reg)**
23. State the convolution property of the Z-transform. [D] [**May/ Jun -2013]**
24. Prove the time shifting property of discrete time Fourier transform?
25. State the final value theorem. [D][**Nov/Dec -2012] (2008 reg)**
26. What is the maim condition to be satisfied to avoid aliasing?
27. Find the Z-transform of x(n) = a*u(n), IaI <1[D] [**May/ Jun -2012]**
28. Write a note on aliasing. [D][**Nov/Dec -2012] (2008 reg)** \
29. Find the DTFT of u(n) . [D] [**May/ Jun -2011]**
30. State the Sampling theorem. [D][**Nov/Dec -2011] (2008 reg)**
31. State the sufficient condition for the existence of DTFT for an aperiodic sequence x(n). [D][**Nov/Dec -2010] (2008 reg)**

PART B

[First Half]

[Baseband signal Sampling]

1. State and prove Sampling theorem. (13) [D] [**Apr/May -2017]** [D][**Nov/Dec -2017, 2014] (2008 reg)(10) [May/Jun 2016]**
2. What is aliasing? Explain the steps to be taken to avoid aliasing. **(6) [D][May/Jun 2016]**
3. State and prove sampling theorem for a band limited signal. . [ID][**Nov/Dec -2013] (2008 reg)**
4. Discuss the effects of undersampling a signal using necessary diagrams. (5) [ID][**Nov/Dec -2016]**
5. Consider an analog signal x(t) = 5 cos 200 π t. i) Determine the minimum sampling rate to avoid aliasing. ii) If sampling rate Fs = 400 Hz. What is the DT signal after sampling? (6) [D][**Nov/Dec -2017]**

[Fourier Transform of discrete time signals (DTFT) – Properties of DTFT]

6. State and prove the following properties of DTFT
   (i) Differentiation in frequency
   (ii) Convolution in frequency domain. (13) [D] [**Apr/May -2017]**
7. Determine unit step response of the LTI system defined by
   $d^2y/dt^2 + 5dy/dt + 6y(t) = dx/dt + x(t)$. (6) [D][**Nov/Dec -2017]**
8. State and prove the following theorems :
   i) Convolution theorem of DTFT (6)
   (ii) Initial value theorem of z-transform (7) **[D][May/Jun 2016]**
9. Find the discrete -time Fourier transform of the following i) x(n) = {1,-1,2,2}
   ii) $X(n) = 2^n u(n)$
   iii) $X(n) = 0.5^n u(n) + 2^{-n} u(-n-1)$ (13) [D][**Nov/Dec -2017] (2008 reg)**

10. Compute DTFT of a sequence x(n) = (n-1) x(n) Use DTFT properties. (6) [D][**Nov/Dec -2015] (2008 reg)**
11. Find the discrete time Fourier transform of x[n]=[(1/ 2)$^{n-1}$ u(n-1)] (7) [D][**Nov/Dec -2015] (2008 reg)**
12. Determine the discrete time Fourier transform of x(n) =a ^{lnl} , IaI <1 (7) [D][**Nov/Dec -2013] (2008 reg)**

[Second Half]

[Z Transform & its properties]

13. Find the Z transform and sketch the ROC of the following sequence x[n] = 2^n u[n] + 3^n u(- n - 1).
14. Find the Inverse z -transform using partial fraction method. X(z) = (3- (5/6)z^{-1})/(1-(1/4)$^{z-1}$)(1-(1/3)$^{z-1}$) ; │z│> 1/3 (7) [D][**Nov/Dec -2017]**
15. Find the Z -transform of x[n]. a^n u[n]- b^n u[- n -1] and specify its ROC. (8) [D][**Nov/Dec -2016]**
16. Give the relation between Discrete Time Fourier Transform (DTFT) and Z -transform. (5) [D][**Nov/Dec -2016]**
17. State and prove the time shifting property and time reversal property of Z -transform. (8) [D][**Nov/Dec -2016]**
18. b) State and prove any four properties of z -transform. (13) [D][**Nov/Dec -2017] (2008 reg)**
19. Write the properties of z -transform. Explain in detail about complex convolution theorem and final value theorem. (13) [D][**Nov/Dec -2017] (2008 reg)**
20. State and prove the properties of z -- transform. (13) [D][**Nov/Dec -2015] (2008 reg)**
21. Find inverse z-transform of X(z)= z^{-1}/ (1-0.25z^{-1}-0.375z^{-1}) for i) ROC Iz l > 0.75 (ii) ROC IzI < 0.5 [D][**Nov/Dec -2013] (2008 reg)**
22. Using Z-transform, find the convolution of two sequences x1(n) ={1,2,-1,0,3}, x2(n) + {1,2,-1}.(4) [D][**Nov/Dec -2014] (2008 reg)**
23. Find the X(Z) if x(n) = n^{2}u(n) . (4) [D][**Nov/Dec -2014] (2008 reg)**
24. Find the z transform and ROC of the sequence x(n) = r^n cos(θn)u(n). (6) [D][**Nov/Dec -2013] (2008 reg)**
25. Find the inverse z-transform of the function x(z) = (1+z^{-1})/(1-(2/3z$^{-1)}$)^2 ROC IzI > 2/3 (6) [D][**Nov/Dec -2013] (2008 reg)**

UNIT – V LINEAR TIMES INVARIANT- DISCRETE TIME SYSTEMS

PART-A

1. What is the necessary and sufficient condition on impulse response for stability of a casual LTI system? [D] [**Apr/May -2017]**
2. What is the difference between recursive and non recursive systems? [D] [**Apr/May -2017]**
3. Write the condition for stability of a DT-LTI system with respect to the position of poles. [D][**Nov/Dec -2017]**
4. Realize the difference equation y[n] = x[n] - 3x[n -1] in direct form I. [D][**Nov/Dec -2017]**
5. From discrete convolution sum, find the step response in terms of h(n). **[D][May/Jun 2016]**
6. Define the non recursive system. **[D][May/Jun 2016]**
7. Convolve the following sequences x[n] = {1, 2,3} & h[n] = 11, 1, 2} . [D][**Nov/Dec -2016]**
8. Given the system function H(z) = 2+ 3z^{-1} + 4z^{-3} - 5z^{-4} Determine the impulse response h[n] [D][**Nov/Dec -2016]**
9. Convolve the following signals x(n) = {1, 2, 3} and h(n) = {1, 1, 2}.[D][**Nov/Dec -2017] (Reg 2008)**
10. Determine the z -transform of the following signal x(n) = a^{n}u[n], lal ⇧ 1 and also specify whether Fourier transform of the signal exists.[D][**Nov/Dec -2017] (Reg 2008)**

11. What are the properties of convolution? [D][**Nov/Dec -2016] (Reg 2008)**
12. List the four steps used to obtain convolution. [D][**Nov/Dec -2015] (Reg 2008)**
13. Give the impulse response of a linear time invariant time as h(n) = sin πn, check whether the system is stable or not. [D][**Nov/Dec -2014]**
14. In terms of ROC, state the condition for an LTI discrete time system to be causal and stable. [D][**Nov/Dec -2014]**
15. Write the nth order difference equation. [D][**Nov/Dec -2014] (Reg 2008)**
16. Define convolution sum with its equation. [D][**Nov/Dec -2013] (Reg 2008)**
17. Convolve the following two sequences :
    X (n) = {1, 1, 1, 1}
    h (n) = {3, 2}2
18. Give the Nth order linear constant coefficient difference equation of discrete system. [ID] [**Apr/May -2017] (Reg 2008)**
19. Find the stability of the system whose impulse response is h (n) = 2"u (n). [D] [**Apr/May -2017] (Reg 2008)**
20. A causal LTI system has impulse response h(n), for which the z-transform is
    H (z) = $(1 + z^{-I}) / (1 - 0.5 z^{-I}) (1 + 0.25 z^{-I})$. Is the system stable? Explain. **[D][May/Jun 2016] (Reg 2008)**
21. Convolve the following two sequences :
    X (n) = {1, 1, 1, 1}
    h (n) = (3, 2) **[D][May/Jun 2016] (Reg 2008)**
    Find the overall impulse response h(n) when two systems $h_1(n) = u(n)$ and $h_2(n)=\delta(n)+2\ \delta(n-1)$ are in series. **[D][May/Jun 2014] (Reg 2008)**
22. Define convolution sum with its equation. **AU DEC-2013**
    Is the discrete time system described by the difference equation y(n)=u (-n)causal. **[D][May/Jun 2013] (Reg 2008)**
    If X (ω) is the DTFT of x(n) , what is the DTFT of x*(-n)? **[D][May/Jun 2013] (Reg 2008)**
23. Convolve the following two sequences: x(n)={1,1,1,1}, h (n) = {3,2} [D][**Nov/Dec -2012] (Reg 2008)**
24. Define the shifting property of the discrete time unit Impulse function. **[D][May/Jun 2010] (Reg 2008)**
25. Define one sided Z- transform and two- sided - transform. **[D][May/Jun 2010] (Reg 2008)**
26. Determine the range of 'a' for which the LTI system with impulse response $h(n) = a^n u(n)$ is stable. [D][**Nov/Dec -2010] (Reg 2008)**
27. Prove that $x(n)*\delta(n) = x(n)$. [D][**Nov/Dec -2010] (Reg 2008)**
28. What is the overall impulse response h(n)when two system with impulse responses h1(n) and h2(n) are connected in parallel and in series? [D][**Nov/Dec -2011] (Reg 2008)**
29. Find the convolution of the two sequences x(n)= {1,1,1,1} and h(n) = {2,2} [D][**Nov/Dec -2011] (Reg 2008)**
    List the advantages of the state variable representation of a system. **[D][May/Jun 2012] (Reg 2008)**
    Find the system function for the given difference equation y(n)= 0.5 y(n-1)+ x(n) **[D][May/Jun 2012] (Reg 2008)**
30. Find the system function for the given difference equation y(n) = 0.5 y(n-1)+ x(n). **[D][May/Jun 2012] (Reg 2008)**

PART B

[First Half]

[Impulse response – Difference equations]

1. For a causal LTI system the input x(n) and output y(n) are related through a difference equation y(n) - 1/6 y(n-1)- 1/6 y(n-2) = x(n). Determine the frequency response H ($e^{j\omega}$) and the impulse response h(n) of the system. (13) [D] [**Apr/May -2017]**
   Obtain the parallel realization of the system given by y(n) - 3y(n - 1) + 2 y(n - 2) = x(n). (7) [D][**Nov/Dec -2017]**

2. Determine the direct form II structure for the system given by difference equation y(n) = (1/2)y(n -1)- (1/4)y(n - 2) + x(n)+x(n -1). (7) [D][**Nov/Dec -2017]**

3. Using the properties of inverse Z -transform solve : i) x(z) = log $(1+az^{-1})$; $|z|>|a|$ and X (z) = $az^{-1}/ (1-z^{-1})^2 |z|>|a|$
   ii) Check whether the system function is causal or not.
   H (z) = 1/ $(1-(1/2)\ z^{-1}) +1/1-2z^{-1}$ $|;z|>|2|$
   iii) Consider a system with impulse response H(s) = $e^s/s+1$; Re{s} > -1. Check Whether the given systems function is causal or not. (13) [D][**Nov/Dec -2017]**
4. Realize the following system in cascade form: H(z) = $(1+(1/5)z^{-1})/ [(1-1/2^{z-1}+1/3z^{-2}) (1+1/4z^{-1})]$ (7)**[D][May/Jun 2016]**
5. A system is governed by a linear constant coefficient difference equation y(n) = 0.7 y (n - 1) - 0.1 y(n 2) + 2x (n) -x (n - 2). Find the output response of the system y(n) for an input x(n) = u(n). (13)**[D][May/Jun 2016]**
6. Determine whether the given system is stable by finding H(z) and plotting the pole -zero diagram y[n] = 2y[n -1] - 0.8y[n - 2] + x[n] + 0.8x[n -1]. (13) [D][**Nov/Dec -2016]**
7. Find the output response of the system y(n) for an input x(n) = u(n)
8. Determine the impulse response and step response o y(n)+y(n-1)-2y(n-2)= x(n-1)+2x(n-2) (10) [**Apr May 2015]**
9. Obtain the cascade realization of y(n)-1/4 y(n-1)-1/8y(n-2)=x(n)+3x(n-1)+2x(n-2). **(13)** [**Apr May 2015]**
10. Draw direct form I and direct form II implementations of the system described by difference equation.

    Y(n) + ¼ y(n-1) + 1/8 y(n-2) = x(n) + x(n-1) **(7)**

11. Obtain the impulse response of the system given by the difference equation Y(n) – 5/6 y(n-1) + 1/6 y(n-2) = x(n) **(7) [D][May/ Jun 2013]**

12. Determine the range of values of the parameter "a" for which LTI system with impulse h(n) = a^n u(n) is stable. **(6) [D][May/ Jun 2013]**

13. Compute the response of the system y(n) = 0.7 y(n-1) – 0.12y(n-2) + x(n-1) + x(n-2) to the input x(n) = nu(n). is the system stable? **(6) [D][May/ Jun 2013]**

14. Derive the necessary and sufficient condition for BIBO stability of an LSI system. (4)[D] **[Nov/Dec-2012]**

15. Draw the direct form, cascade form and parallel form block diagrams of the following system function:

    H(Z) = 1/ (1-1/2Z-1)(1-1/4Z-1) **(13)** [D] **[Nov/Dec-2012]**

16. Find the impulse response of the difference equation y(n) – 2y(n-2) +y(n-1)+3y(n-3) = x(n)+2x(n-1)

17. Find the input x (n) which produces the output y(n) = {3,8,1,4,8,3} when passed through the system having h(n) = {1,2,3}. (7)

18. Obtain the Direct form II structure for y(n) – ¾ y(n-1) + 1/8y(n-2) = x(n) + 1/2x(n-1). (7)

[Convolution sum]

19. Convolve the following signals x[n] = u[n]- u[n -3] & h[n] = $(0.5)^n$ u[n] .. (13) [D][**Nov/Dec -2016]**

20. Perform convolution to find the response of the systems h_1 (n) and h_2 (n) for the input sequences x_1 (n) and x_2 (n) respectively. (i) x_1 (n) = (1, 1, 2, 3) h_1 (n) = (1, 2, 3, 1)
(ii) x_2(n) = (1, 2, 3, 2) h_2(n) = (1,2,2). (13) [D] [**Apr/May -2017]**
21. Compute y(n) = x(n)*h(n) where x(n)= $(1/2)^{-n}$ u(n-2), h(n) = u(n-2) (13) **AU DEC 2014**
22. Find the convolution sum between x(n)={1,4,3,2} and h(n)= {1,3,2,1}(6) **AU MAY 2015**
23. Convolve x(n) = {1, 1, 0, 1, 1}, h(n) = {1, -2, -3, 4} (6)**[D][May/Jun 2016]**
⇧ ⇧
24. Convolve the following signals x (n) = $(1/2)^{n-2}$ u (n-2), h (n) = u (n+2). **(13) AU DEC 2015**
25. Find the convolution sum of x[n] = r[n] and h[n] = u[n]. (16) AU JUN-2014 **(7 Marks)**
26. Compute the linear convolution of x(n)= {1,1,0,1,1} and h()= {1,-2,-3,4**}. (6) AU DEC 2002/05**
⇧
27. Compute the convolution sum of the following sequences x(n) = {1, $0 \le n \le 4$; 0, otherwise
H (n) = {α^n, $0 \le n \le 6$; 0, otherwise. (7) [**D] [Nov/Dec-2013]**

[Second Half]

[Discrete Fourier Transform and Z Transform Analysis of Recursive & Non-Recursive systems-DT systems connected in series and parallel]

28. Analyze on recursive and non -recursive systems with an example. (15) [D][**Nov/Dec -2017]**

29. Find the output sequence y(n) of the system described by the equation y(n)=0.7 y(n-1)-0.1 y(n-2)+2x(n)-x(n-2. For the input sequence x(n)=u(n). (13) AU MAY/DEC 2009
30. LTI discrete time system y(n)= 3/2y(n-1)-1/2y(n-2)+x(n) + x(n-1)is given an input x(n)= u(n).i) find the transfer function of the system ii) find the impulse response of the system. (13) **AU DEC 2014**
31. A causal LTI system has x(n) = δ(n) + ¼ δ(n-1)-1/8 δ(n-2) and y(n) = δ(n) – ¾ δ(n-1. Find the impulse response and output if x(n)= $(1/2)^n$ u(n). **(10)AU DEC 2015**
32. Compare recursive and non recursive systems. (4) **AU DEC 2016**
33. Consider an LTI system with impulse response h(n) = α^nu(n) and the input to this system is x(n) = β^n u(n) with |α|&|β|<1. Determine the response y(n). i) when $\alpha \neq \beta$ ii) when $\alpha = \beta$ using DTFT. (13) **AU DEC 2015**
34. A causal LTI system is described by the difference equation, y(n)=y(n-1)+y(n-2)+x(n-1) i) find the system function of the system ii) find the unit impulse function of the system. (13) **AU MAY 2008**
35. The system function of the LTI system given a H(Z) = $(3-4Z^{-1})/ (1-3.5Z^{-1}+1.5Z^{-2})$ Specify the ROC of H (Z) and determine h(n) for the following condition. I) stable system ii) causal system (13)
36. A discrete time causal system has a transfer function H(Z) = $(1-Z^{-1})/ 1-0.2Z^{-1}-0.15Z^{-2}$
    i) Determine the difference equation of the system.
    ii) Show pole zero diagram
    iii) Find impulse response of the system(13)
37. Given the difference equation representation of the system y[n] – 3/4y [n -1]+ 1/8 y (n-2) = x(n) – 1/2x(n). Find the response y[n] for the input x[n] = $(1/2)^n$ u (n) using DTFT. (13)

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