b) Determine the DT sequence associated with Z transform given below;

(i) $X[z] = \frac{1-(1/2)z^{-1}}{1+(1/2)z^{-1}}$; $|z| > 1/2$

(ii) $X[z] = \frac{z^2+z}{z^2+2z+1}$; $|Z| > 3$ [10]

Q. 4 a) i) Obtain Fourier Transform of rectangular pulse of duration n T and amplitude A.

ii) Obtain the fourier transform of impulse function. [10]

b) Find the Laplace transform of and draw its ROC.

(i) $x(t) = e^{-2t}[u(t) - u(t-5)]$

(ii) $x(t) = e^{-3t}[u(t)]] + e^{2t}[u(-t)]$ [10]

Q. 5 a) A causal discrete time LTI system is described by

$y[n] - \frac{3}{4}y[n-1] + \frac{1}{8}y[n-2] = x[n]$ where x[n] and y[n] are input and output of the system respectively .

(i) Determine the system function H[z]
(ii) Find the impulse response h[n] of the system
(iii) Find the step response s[n] of the system. [10]

b) Obtain the inverse Laplace transform of

(i) $X(s) = \frac{5s^2-15s-11}{(s+1)(s-2)^3}$

(ii) $X(S) = \frac{s-3}{s^2+4s+13}$ [10]

Q. 6 a) Find Z transform and specify its ROC