2021
B.E. (Information Technology)
Seventh Semester
ITE-701/741: Digital Signal Processing

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

Q No	Questions	Marks
1	(a) What are LTI systems? (b) What is the difference between DFT and DTFT? (c) What is the difference between IIR and FIR filters? (d) What is the difference between time domain and frequency domain signals? (e) What are the applications of DSP?	(10)
	Part A	
2	(a) Perform the Z transform of the following signal $x(n) = \cos \omega n\, u(n-1)$ Also find ROC for $x(n)$ (b) Find inverse Z-transform of the signal. $X(z) = \dfrac{1}{(1-2z^{-1})(1+4z^{-1})}$	(5) (5)
3.	Calculate FFT of signal $x(n)=\{0,1,2,3,4,5,6,7\}$	(10)
4.	Convert analog filter to digital filter whose system function is $H(s) = \dfrac{1}{(s+1)^2\,(s+2)}$	(10)
	Part B	
5.	Realize the following system using Direct form-I, Direct form-II, cascade and parallel form. $y(n) = \frac{3}{4} y(n-1) - \frac{1}{8} y(n-2) + x(n) + \frac{1}{3} x(n-1)$	(10)
6.	The desired frequency response of a low pass filter is $H_d(e^{j\omega}) = \begin{cases} e^{-j8\omega} & 0 \le \omega \le \pi/2 \\ 0 & \pi/2 \le \|\omega\| \le \pi \end{cases}$, determine $h_d(n)$. Also determine $h(n)$ using rectangular window with window length=5	(10)
7	Write note on ADSP21xx DSP chip	(10)

x-x-x