Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

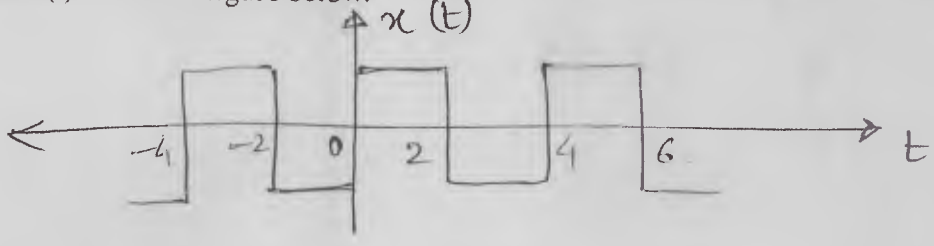
(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

Re-Exam
December 2019

Max. Marks: 100 | Duration: 3 Hr.
Class: SYBTech | Semester: IV | Program: Electrical
Name of the Course: **Signals and Systems** | Course Code : BTE230

Instructions:

- Attempt any FIVE question
- Answers to all sub questions should be grouped together
- Figures to the right indicate full marks
- In the absence of any data, make suitable assumptions and justify the same.

Q. No		Max Marks
Q1a	Classify system $y[n]=x[n+12]$ as static/dynamic, linear/non-linear, time-variant/invariant, causal/non-causal and stable/unstable.	05
b	Find Z- Transform of x(n)= n u(n).	05
c	Determine odd and even parts of signal x[n] = {4 ,1 ,-1 ,2 ,1 ,-1,5}.	05
d	Given DT signal x(t)=u(t), plot x(t+1)+x(t-1) .	05
Q2a	Find the exponential Fourier Series and plot the magnitude and phase spectrum of the signal x(t) shown in figure below. 	10
b	Consider a LTI system with frequency response $H(j\omega)=\frac{j\omega+1}{(j\omega+5)(j\omega+7)}$. Determine its impulse response. For a given input x (t) = e^{-4t} u (t) evaluate y (t).	10
Q3a	Find the inverse Laplace Transform of $X(s)=\frac{(2s+1)}{(s+4)(s+9)}$ if the convergence regions are i) $s>-4$ ii) $s<-9$ iii) $-9<s<-4$.	10

b	In an electrical network the relation between input voltage x(t) and output voltage y(t) is given by $4\ddot{y}(t) + 5\dot{y}(t) + y(t) = x(t)$ where x(t) = 5u(t). Determine the output voltage y(t) if initial conditions in the network are y(0) = -1 and $\dot{y}(0) = 1$.	10
Q4a	Consider a system described by the difference equation y[n] = 2 y[n-1] + 10 x[n]. Find the response of the system to the input x(n) = $(0.4)^n$ u(n). Initial conditions in the system are y(-1) = 1.	10
b	Calculate the value of e^{t} u(t)* e^{-2t} u(t) using continuous time linear convolution.	10
Q5a	Determine x[n] if $X(z) = \frac{z-5}{(z-2)(z-3)(z-1)}$.	10
b	State and prove time scaling and time shifting property of Z-Transform.	05
c	Determine Z – Transform of $\sin(\omega_0 n)\, u[n]$	05
Q6a	Obtain Direct form I and Direct form II realization of a system with transfer function $H(z) = \frac{2z^2+12z+10}{z^2+2z-5}$.	10
b	Test if the signal $x[n] = (\frac{1}{4})^n \quad u[n]$ is an energy or a power signal?	04
c	Determine linear convolution of following sequence. X[n]= {-3,1,4,0,-2,1} and h[n]= {5, -2, 3 0, 1 -3}.	06

New/old

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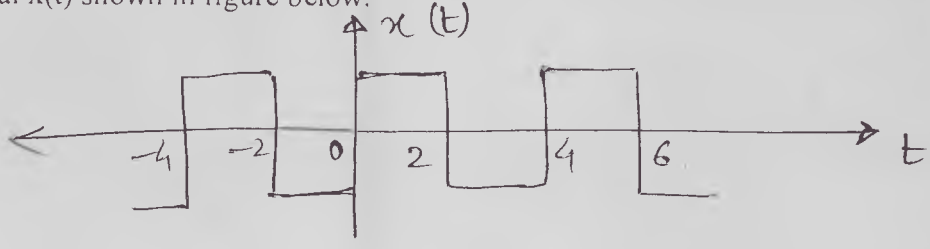
Q2a	Find the exponential Fourier Series and plot the magnitude and phase spectrum of the signal x(t) shown in figure below. 	10
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Re-exam(Dec 2019)

Program: : Electrical Engineering
Course Code : PC-BTE404
Name of the Course: Microprocessors and Microcontrollers
Duration:3 hours
Max points: 100 marks
Semester: IV

Note: **Instructions:**

- Answer any **five** questions.
- Assume suitable data if required.
- Answers to all sub-questions should be grouped together

Q. No		Marks	CO	BL	PI
1a	Explain the addressing modes of 8051 microcontroller with examples.	10	1	2	1.3.1
b.	Write a program to generate a staircase waveform using DAC in 8051 microcontroller.	10	2	3	
2a	Explain any Six bit manipulation instructions of 8051 controllers.	6	1	2	1.3.1
b.	Explain timer modes 1 and 2 of 8051 microcontroller with assembly language program.	12	1' 2	3	
3a.	Explain the difference between i)Conditional and unconditional branch instruction ii)CALL and JUMP instructions iii) subtract and compare instructions iv)PUSH and POP v)MOV and MOVX instructions. With an example.	10	1	2,4	1.3.1
b.	Explain SPI and I2C.	10	1	2	
4a.	Describe the internal architecture of 8051 microcontroller with neat diagram.	10	1	2	1.3.1
b.	Write short notes on serial communication in microcontrollers and special function registers used for serial communication	10	1, 2	3	
5a.	Write an ALP to sort an array of data in descending order.	10	1	3	1.3.1
b.	Explain matrix keyboard interfacing of 8051 microcontroller with neat diagram .with an ALP.	10	1, 2	2,3	