VI CBSGS EXTC

Paper / Subject Code: 37002 / DISTRICT TIME SIGNAL PROCESSING /MAY2019

Q. P. Code: 27083

[Time: Three Hours] **[Marks:80]**

N.B.: (1) Question No.1 is compulsory.
(2) Attempt any three out of remaining questions.
(3) Assume suitable data wherever required.

Q.1 a. State Parseval's relation in z-transform. (05)

b. Assume two finite duration sequences $x_1(n)$ and $x_2(n)$ are linearly combined. Let $x_3(n) = ax_1(n) + bx_2(n)$. What is the DFT of $x_3(n)$? (05)

c. What is the need for employing window technique for FIR filter design? (05)

d. What is the need for anti–aliasing filter prior to downsampling? (05)

Q.2.a. Design an FIR filter approximating the ideal frequency response (10)

$H_d(e^{jw}) = e^{-j3w}$ for $\frac{-\pi}{4} \ |\omega| \ \leq \frac{\pi}{4}$

$= 0$ for $\frac{\pi}{4} \leq |\omega| \leq \pi$

Using Hamming window with N= 7.

b. Derive the DFT of the sample data sequence x(n)={ 1,1,2,2,3,3}and compute the corresponding amplitude and phase spectrum. (10)

Q.3.a. Determine 8 point DFT for a continuous time signal, $x(t) = \sin(2nFt)$ with $F = 50Hz$ using DIF FFT algorithm. (10)

b. Design a Butterworth filter using the impulse variance method for the following specifications (10)

$0.9 \leq |H(e^{jw})| \leq 1 \qquad 0 \leq \omega \leq 0.3\pi$

$|H(e^{jw})| \leq 0.1 \qquad 0.7\ \pi \leq \omega \leq \pi$

Q.4.a. Determine the Direct form-I and Direct form-II realization for the system $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$. (10)

[TURN OVER]

b. A multirate system is shown below in Fig.1. Find the relation between x(n) and y(n) . (10)

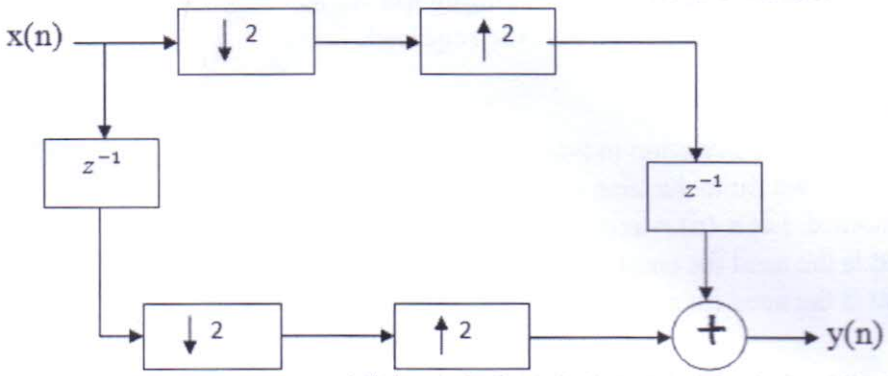

Fig.1

Q.5 a. Determine the periodogram of the random signal by taking 8 samples of the signal (10)

$x(n) \cos 2\pi f_1 n + \cos 2\pi(f_1 + \Delta f)n$, $f_1 = 0.2$, $\Delta f = 0.05$.

b. The transfer function $H(z) = H_1(z)H_2(z)$ where (10)

$$H_1(z) = \frac{1}{1-a_1 z^{-1}} \text{ and } H_2(z) = \frac{1}{1-a_2 z^{-1}}$$

Assume $a_1 = 0.5$ and $a_2 = 0.6$, find the output roundoff noise power. (10)

Q.6.Write short notes on following,

a. Musical Sound Processing. (07)

b. Dual tone multi frequency signal detection. (06)

c. Subband Coding of Speech signals. (07)

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T.E. SEM VI (ExTC)(CBSGS) May 2019

Paper / Subject Code: 37003 / COMPUTER COMMUNICATION AND TELECOM NETWORKS

Duration: 3 hours **Max marks: 80**

Note the following instructions.

i) Question No.1 is compulsory (attempt any 4)
ii) Total 4 questions need to be solved
iii) Attempt any three questions from remaining five questions.

1.a	What is the difference between unicast and Multicast routing?	[5]
1.b	What are the types of timers used in TCP, Explain?	[5]
1.c	A company is granted the site address 201.70.64.0(Class).The Company needs six subnets .Design the subnets.	[5]
1.d	Explain Shortest path algorithm with suitable diagram.	[5]
1.e	Explain the difference between a connection oriented and connectionless service.	[5]
2.a	Explain Various network hardware devices in detail.	[10]
2.b	i. What is distance vector routing and link state routing.	[5]
	ii. Explain exterior and interior routing.	[5]
3.a	What are different types of ARQ? Explain GO BACK N ARQ	[10]
3.b	What is HDLC? What are HDLC frame types, Explain modes of operation in details.	[10]
4.a	Draw and explain TCP Header format.	[10]
4.b	Explain TCP congestion control policy.	[10]
5.a	What is carrier sensing? Explain CSMA/CD and CSMA/CA in detail.	[10]
5.b	What is ALOHA? What are the types of ALOHA? Compare them.	[10]
6	Write a short notes **(any two)**:	[20]

a. ISO-OSI network model
b. Transmission Media
c. DNS

Q.P. Code :23610`

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question.No.1 is compulsory.
2. Answer any Three out of remaining six questions.
3. Draw the neat diagrams wherever necessary.

Q.1	1	Answer the following	20
	a.	Draw and Explain of color difference signal circuit.	
	b.	Explain the specification of vertical sync pulse and need of serrations in it	
	c.	What is the function electron multiplier in image orthicon camera tube	
	d.	Explain EBU MAC system in brief.	
Q2	a)	What is NTSC? Draw and explain NTSC Decoder.	20
	b)	What is MUSE system? Explain its technical specifications, advantages and disadvantages.	
Q3	a)	Draw and Explain half line discrepancy. How can it be eliminated?	20
	b)	Explain: 1) Why (G-γ) signal is not selected for transmission? 2) Explain how effective number of lines is evolved.	
Q4	a)	Draw sync separator section in Television system and explain it in detail.	20
	b)	Draw and explain color television camera system and what the purpose of dichroic lance is.	
Q.5	a)	Draw and explain delta gun color picture tube.	20
	b)	Explain MAC signal its compression technique and scanning frequency.	
Q.6		Write short notes on (any two)	20
	a)	Cancellation of phase error in PAL.	
	b)	Compatibility factors for monochrome and color television.	
	c)	DTH Television system.	

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(3 Hours) [Total Marks : 80]

N.B. (1) Question No. 1 is compulsory
(2)Assume suitable data if necessary
(3)Attempt any three questions from remaining questions

1
(a) Draw and explain process state transition diagram. (5)
(b) What is kernel of an Operating System? Explain different types of kernels. (5)
(c) Explain the concept of segmentation. (5)
(d) What are the characteristics of a Real Time OS? (5)

2 (a) Consider the following set of processes with CPU burst time given in milliseconds. (10)

Process	Burst time	Arrival time
P1	10	1
P2	4	2
P3	5	3
P4	3	4

Draw Gantt chart for FCFS and Shortest Remaining Time First (SRTF) and calculate average waiting time and average turnaround time.

(b) Explain how logical address is translated into physical address using paging mechanism with the help of a diagram. (10)

3 (a) Explain Buddy algorithm in LINUX memory management. (10)
(b) Consider the following snapshot (10)

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	1	3	5	0	6	5	1	3	5
P1	1	0	0	2	1	3			
P2	2	0	1	3	4	6			
P3	4	1	1	1	5	7			
P4	5	4	3	0	0	1			

Answer the following using Banker's algorithm.
(i) What is the content of matrix Need?
(ii) Is the system in the safe state?
(iii) If the request from process P1 arrives for (0, 4, 2, 0) can request be granted immediately?

4 (a) Explain the working of EDF and RMA real time scheduling algorithms. (10)

(b) Calculate page hit and page miss for the following string using page replacement policies FIFO and LRU. Page frame size is 3. (10)

1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3

5 (a) Explain Disk Arm Scheduling algorithms. (10)

(b) What is semaphore? Give an implementation of bounded buffer producer consumer problem using semaphore. (10)

6 (a) What are system calls? Explain any five system calls. (10)

(b) Explain how UNIX performs file management using I-nodes. (10)
