EXTC / SEM VI (CBSGS)

Paper / Subject Code: 37002 / DISTRICT TIME SIGNAL PROCESSING / NOV. 2018

Q.P. CODE: 37019

Time: 3 Hours

Marks: 80

N.B: (1) Questions No.1 is compulsory.
(2) Attempt any three questions out of remaining five questions.
(3) Assume suitable data if required.
(4) Figures to the right indicate full marks.

Q 1.Solve any four

a) Determine the zeros of the following systems and indicate whether the system is minimum, maximum or mixed phase.

1) $H_1(z) = 6+z^{-1}+6z^{-2}$ 5
2) $H_2(z)= 1-z^{-1}-6z^{-2}$

b) Define group delay and phase delay. 5

c) Compare FIR and IIR filters 5

d) What is frequency warping in bilinear transformation. 5

Q2 a) Compute DFT of sequence x(n)={ 2,1,2,1,1,2,1,2 } using DIT-FFT algorithm. 10

b) A low pass filter is to be designed with following desired frequency response.

$$Hd(e^{jw})=e^{-j2w} \quad -\frac{\pi}{4} \le w \le \frac{\pi}{4}$$

$$=0 \quad \frac{\pi}{4} < w \le \pi$$

Determine the filter coefficients $h_d(n)$ if the window function is defined as

$w(n)=1 \quad 0 \le n \le 4$

$=0 \quad$ otherwise

Also determine the frequency response $H(e^{jw})$ of the designed filter. 10

Q 3 a)The transfer function for discrete time system is given as

$$H(z)= \frac{1+\frac{1}{2}Z^{-1}}{1-\frac{3}{4}Z^{-1}+\frac{1}{8}Z^{-2}}$$

i) Draw Direct Form I and Form II realization

ii)Draw cascaded and parallel form realization 10

b) Explain subband coding of speech signal as a application of multirate signal processing. 10

Q.P. CODE: 37019

Q4 a) Develop composite radix DITFFT flow graph for N=6=2×3. 10

b) Design a digital Butterworth filter that satisfies following constraints using bilinear transformation method. Assume Ts=1s.

$$0.9 \le |H(e^{jw})| \le 1 \qquad 0 \le w \le \frac{\pi}{2}$$

$$|H(e^{jw})| \le 0.2 \qquad \frac{3\pi}{4} \le w \le \pi$$

10

Q 5 a) Show the mapping from S plane to Z plane using impulse invariant method. Explain its limitations. Using this method determine H(z) if

$$H(s)=\frac{10}{(s+5)(s+2)} \quad \text{if } Ts=0.2s.$$

10

b) If x(n)={ 1,2,3,} and h(n)= {1,0}

1) Find linear convolution using circular convolution
2) Find circular convolution using DFT-IDFT.

10

Q6 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

sem- VII - CBSGS .

Q.P. Code : 34633

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

Please check whether you have got the right question paper.

N.B:
1. Question No.1 is compulsory.
2. Solve any three out of remaining five questions.
3. Draw neat diagram if necessary.
4. Assume suitable data wherever required.

1 Attempt any four out of five 20

a) What is framing? How frames can be classified?

b) A pure ALOHA network transmits 200 bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces:
(i) 1000 frames per second
(ii) 500 frames per second
(iii) 250 frames per second

c) Explain Three-Way Handshaking for connection establishment in TCP

d) What is the subnetwork address if the destination address is 200.45.34.56 and the subnet mask is 255.255.240.0?

e) Differentiate between Bus Topology and Ring Topology

2 a) Explain OSI model. Consider a source, destination machine and some intermediate nodes for the discussion. 10

b) (i) Differentiate between TDM and FDM 5
(ii) Explain various addresses used in TCP/IP Layered Architecture. 5

3 a) What is DSL Technology? List different DSLs available. Discuss salient features of ADSL 10

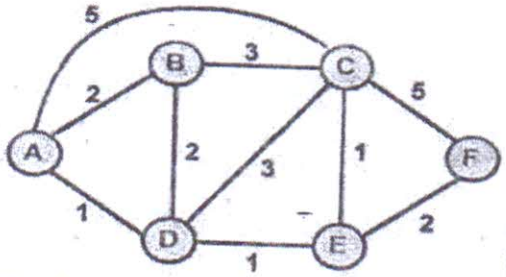
b) Explain CSMA/CD in detail and also mention its use. 10

4 a) Draw and explain TCP Header format. 10

b) What is sliding window protocol? Explain Stop and Wait ARQ in detail. 10

5 a) Using the below figure, apply the Bellman-Ford algorithm to find bo.th the minimum cost from each node to the destination node (assume node F) and the next node along the shortest path. Also draw the tree diagram. 10

Q.P. Code : 34633



b) Define Classful addressing scheme used in IPV 4. What is a mask and range of addresses used fo each class?

Q.6 Write a short notes on (any two):

a) HFC

b) ATM

c) DNS

****

B0CA8E8298E89A494B3F347888E872F4

EXTC/SEM VI (CBSGS) Paper / Subject Code: 37004 / TELEVISION ENGINEERING /Nov. 19

Q. P. Code : 37699

(3 Hours) (Total Marks: 80)

Please check whether you have the right question paper.

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

1.	(a)	Explain frame rate and refresh rate in digital TV	05
	(b)	Explain when and why the horizontal sweep oscillator step out of synchronism.	05
	(c)	Give CCIR-B standards.	05
	(d)	Explain merits and demerits of LED display.	05
2.	(a)	Draw and explain Horizontal sync details compared to horizontal deflection sawtooth wave.	10
	(b)	Explain D2-MAC packet format and state D2-MAC characteristics.	10
3.	(a)	Why are serrations needed in vertical sync pulses and how it solves the problem of half-line discrepancy? Explain with diagram.	10
	(b)	Draw and explain Image orthicon camera tube. What is the function of the electron multiplier section?	10
4.	(a)	Draw and explain NTSC decoder along with the explanation for phasor diagrams of the signals in the NTSC system.	10
	(b)	Explain MAC signals its compression technique and scanning frequency.	10
5.	(a)	Explain with diagram wide dimension HDTV.	10
	(b)	What is the need of MUSE system? Explain its technical specifications, advantages and disadvantages.	10
6.		Write short notes on (any two):--	20
	(a)	EBU MAC system	
	(b)	VSB transmission for TV, how much frequency is allocated for attenuation slope and why?	
	(c)	Sync pulse separation and generation of vertical and horizontal sync pulses.	

VI(CBSGS) / Paper / Subject Code: 37005 / OPERATING SYSTEMS / NOV. 18

EXTC

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

Please check whether you have got the right question paper.

N.B:
1. Question.No.1 is compulsory.
2. Attempt any **three** questions from remaining **five** questions..
3. Make suitable assumptions wherever necessary and state them **clearly.**

Q1 a) Define a file system. What are various components of a file system? State and explain commonly used operations on file. 5

b) What is the difference between a system call and an interrupt? 5

c) Give memory partition of 100K,500K,200K,300K and 600K(in order).How would each of the first fit, best fit and worst fit algorithm place process of 212k,417k,112k,and 426k(in order)? Which algorithm makes the most efficient use of memory? 5

d) Write four optimizing criteria for CPU scheduling. 5

Q.2 a) Consider the following page reference string A,B,C,D,B,A,E,F,A,B,C,G,F,C,F. How many page faults would occur for the following page replacement algorithm assuming three and four frames? Remember all frames are initially empty: 10

i) FIFO
ii) Optimal
iii) LRU

b) Justify the need for process synchronization & Design a solution for producer consumer problem using semaphore. 10

Q.3 a) Consider the following snapshot of the process to be executed. Draw the Gantt chart and determine the average. waiting time and average turnaround time for FCFS, SJF(non-preemptive) and round robin (quantum=2) scheduling algorithm. 10

Process	Arrival Time	Burst Time
P1	0	4
P2	2	5
P3	4	6
P4	5	2

b) Consider the following snapshot 10

Process	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 2 1 2	0 3 2 2	2 5 3 2
P1	1 1 0 2	2 7 5 2	
P2	2 2 5 4	2 3 7 6	
P3	0 3 1 2	1 6 4 2	
P4	2 4 1 4	3 6 5 8	

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 PI arrives for (1,3,2,1) can request be granted immediately?

59076

Q.4 a) Suppose the head of moving-head disk with 200 tracks, numbered 0 to 199 is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in the FIFO order 86,147,91,177,94, 150, 100, 175, 130 What is total head movement to satisfy these requests for the following disk scheduling algorithms? i) FCFS ii) SSTF iii) C-SCAN 10

b) Explain working of EDF and RMA real-time scheduling algorithms. 10

Q.5 a) What is the virtual memory? Explain with neat diagram the translation of virtual address into physical address in a segmentation/paging system. 10

b) Explain process management in Linux. 10

Q.6 a) State and explain the necessary conditions that lead to deadlock situation. 10

b) Explain how LINUX performs file management. 10

Time: 3 Hours **Marks: 80**

1] Question no.**1** is **compulsory**
2] Attempt any **three** questions out of remaining questions
3] Assume **suitable data** if **required**
4] **Figures** to the **right** indicate marks.

Q. No. 1) Attempt any four from the following [20]

a) Draw VTC curve of static CMOS inverter and show all critical voltages (V_{IL}, V_{IH}, V_{OL}, V_{OH}, and V_{INV}) on the plot. Also show current drawn by CMOS inverter on VTC.
b) Explain any two short channel effects in MOS transistor.
c) What are advantages and disadvantages of dynamic CMOS logic circuit?
d) Implement 4:1 multiplexer using NMOS pass transistor logic.
e) Explain different CMOS clocking styles.

Q. No. 2)
a) Consider a CMOS inverter circuit with the following parameters:
$V_{DD} = 3.3V$ $V_{t0,n} = 0.6V$ $V_{t0,p} = -0.9V$
$K_n = 200\mu A/V^2$ $K_P = 80\mu A/V^2$

Calculate noise margins of the circuit. Consider $K_R = 2.5$. [10]

b) Implement $Y = \overline{A(B+C)(D+E)}$ using
(i) static CMOS logic style
(ii) Dynamic logic
(iii) Depletion load logic
(iv) Pseudo NMOS logic [10]

Q. No. 3)
a) Explain in detail the fabrication sequence of NMOS transistor with cross sectional view of each step. [10]

b) Draw schematic of six transistor SRAM cell. Describe various constraints that should be imposed on the devices to guarantee safe read and write operation. Also discuss relative sizing of the transistors in the cell. [10]

Q. No. 4)

a) Define scaling. Explain different types of scaling. [10]

b) Construct a full adder mirror circuit and compare the structure with direct static CMOS circuit. [10]

Q. No. 5)

a) What are different types of design rules? Draw layout of two input CMOS NAND gate as per lambda based design rules (show units in lambda). [10]

b) Explain in detail static and dynamic power dissipation. What are the main components which make power dissipation in CMOS circuit? [5]

c) What is clock skew? Explain clock distribution technique in VLSI system. [5]

Q. No.6) Write short notes on any FOUR [20]

i) ESD protection circuit.
ii) 4x4 Barrel shifter
iii) Latch up
iv) 3-T DRAM
v) Decoder in memory structure

****