Shri Shankaracharya Institute of Professional Management & Technology
Department of Computer Science & Engineering
Class Test – I   Session- Jan-Jun, 2020, Month- February
Sem- ET&T 6th Subject- Operating System Code- 328672(28)
Time Allowed: 2 hrs   Max Marks: 40

*Note: -   **Attempt any 5 question. All questions carry equal marks.***

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Discuss different functions of OS?	[8]	Understanding	CO1
2.	Explain Real time, Time Sharing & Multiprograming OS?	[8]	Understanding	CO1
3.	What is CPU Scheduling? Discum any three.	[8]	Understanding	CO1
4.	For the following Calculate average TAT. Average WT & Average RT using SRTF Algorithm Process — Arrival Time — Burst Time P_1 — 0 — 5 P_2 — 1 — 3 P_3 — 2 — 4 P_4 — 4 — 1	[8]	Apply	CO2
5.	Find Avg TAT, Avg WT for FCFS & SJF algorithm. Process — Burst Time P_1 — 5 P_2 — 24 P_3 — 16 P_4 — 10 P_5 — 3	[8]	Apply	CO2

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SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY
CLASS TEST – I (Feb -2020)
Branch ET&T – Semester VI
SUBJECT-Information Theory and Coding

Duration: 2 Hours   **Max. Marks: 40**

Note: Attempt any 5 question. All questions carry equal marks.

Q1. Construct a Huffman coding tree for the following message and also its calculate code efficiency.

Message	M1	M2	M3	M4	M5	M6	M7
Probability	0.4	0.2	0.12	0.08	0.08	0.08	0.04

Q2. Apply the Shannon-fano coding procedure for the following message ensemble and determine the average length and efficiency of the code system.

Message	M1	M2	M3	M4	M5	M6	M7	M8
Probability	1/4	1/8	1/16	1/16	1/16	1/4	1/16	1/18

Q3. A discrete source transmit messages X_1, X_2, X_3 with their probabilities $P(X_1)= 0.33$, $P(X_2)= 0.592$, $P(X_2)= 0.740$. The conditional Probabilities matrix is:

$$P(Y/X) = \begin{bmatrix} 0 & 0.8 & 0.2 \\ 0.5 & 0.5 & 0 \\ 0.5 & 0.4 & 0.1 \end{bmatrix}$$

Determine H(X), H(Y/X), H(X,Y).

Q4. The channel matrix is given by

$$P(X,Y) = \begin{bmatrix} 2/3 & 1/3 \\ 1/10 & 9/10 \end{bmatrix}$$

Determine H(X), H(X/Y), H(Y/X) and mutual information I(X;Y).

Q5. Encode the string using Lampel –Ziv algorithm and write the steps for coding

1 0 1 0 1 1 0 1 1 0 1 0 1 0 1 0 1 1

Q6. . Consider a telegraph source having two symbols dot (.) and dash (-). The dot duration is 0.2 second and dash duration is three times of dot duration. The probability of occurrence of dots is twice that of dash and the time between symbols is 0.2 second. Calculate the information rate of telegraph source.

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Note: - Attempt any 5 question. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	For the given sequence $x(n) = 2^n$ and $N = 8$, find $X(K)$ using DIT FFT algorithm	[8]	Apply	CO1
2.	Compute linear and circular convolution of the two sequences $x_1(n) = \{1,1,2,2\}$ and $x_2(n) = \{1,2,3,4\}$	[8]	Apply	CO1
3.	Explain DFT and calculate DFT for the input signal $x(n) = \{0,1,2,3\}$.	[8]	Apply	CO1
4.	Find the response of FIR filter with impulse response $h(n) = \{1,2,4\}$ to the input sequence $x(n) = \{1,2\}$ using periodic convolution.	[8]	Apply	CO1
5.	Determine IDFT of $X(K) = \{3, (2+j), 1, (2-j)\}$	[8]	Apply	CO1
6.	Determine the direct form I realization for the third order transfer function $H(Z) = (0.28Z^2 + 0.319Z + 0.04)/(0.5Z^3 + 0.3Z^2 + 0.17Z – 0.2)$	[8]	Apply	CO2
7.	Draw cascade caconical IIR filter for the transfer functioncshown below $H(Z) = (1 + Z^{-1}) / (1 – Z^{-1} + 0.5Z^{-2})(1 – Z^{-1} + Z^{-2})$	[8]	Apply	CO2
8.	Obtain the direct form II realization of a transfer function described by: $y(n) – (3/4)y(n – 1) + (1/8) y(n – 2) = x(n) + (1/2) x(n – 1)$	[8]	Apply	CO2

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CLASS TEST – I (Feb-2020)
ET 6th
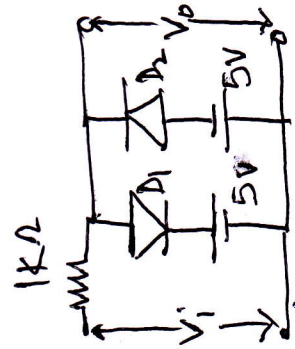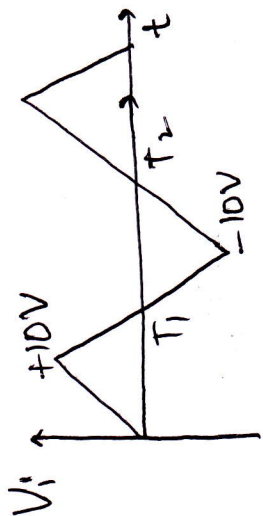Electronic Circuit Design

Duration: 2 Hours   Max. Marks: 40

NOTE: Ques 1 is Compulsory. Attempt any 2 from the remaining 3 Questions
Ques 1 Carries 2 marks. Ques 2 to Ques 4 carries 9 marks each

Unit -1

Q-1- Define Sweep Time.

Q-2- Explain Square wave generator circuit using Op-Amp. Also find the equation of output frequency of oscillation

Q-3- For the circuit shown in figure:

i) Draw the transfer characteristics

ii) Draw the output waveform if the input is 20V (peak to peak) triangular wave

iii) Name the type of circuit

Q-4- Explain an RC Differentiator Circuit?

Unit-2

Q-1- Why is 555 timer called so?

Q-2-Draw the internal block diagram of IC 555 and explain its operation?

Q-3- With neat circuit diagram explain astable multivibrator using IC 555. Also derive the relation for its duty cycle?

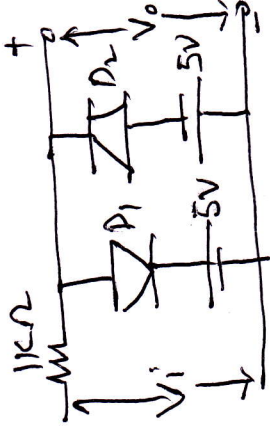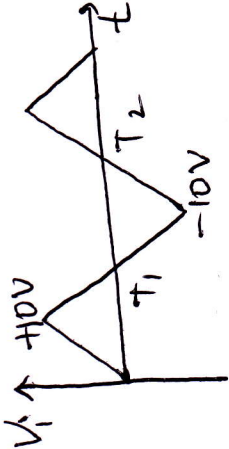Q-4- Draw the internal block diagram of 555 timers in monostable mode and explain its operation with proper waveforms

Duration: 2 Hours   **Max. Marks: 40**

Note: Attempt any *five* and each question carry *equal* marks.

1. Write Short notes on :
   a. Features of 8051, 8052, 8031, 8751 and AT89C51.
   b. Harvard Architecture Vs Von-Neumann Architecture.
   c. RISC Vs CISC processors.

2. Draw Pin Configuration & internal Block Diagram of 8051 microcontroller.

3. Write an ALP to generate a square wave of frequency 2 KHz with 66% duty cycle on port pin P1.2. Use timer 1 in mode 2. Assume crystal oscillator frequency is 22MHz.

4. Write a program to find the maximum number from the ten 8-bit numbers. Assume numbers stored from 2000H and result should be stored in R3 register.

5. What is the job of TMOD and TCON registers & also explain each bit of TMOD and TCON registers.

6. Discuss Addressing mode of 8051 microcontroller with example.

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SHRI SHANKARACHARYA INSTITUTE OF
PROFESSIONAL MANAGEMENT AND TECHNOLOGY
CLASS TEST – I (February 2020)
ET – 6th SEMESTER
VLSI Design

Duration: 2 Hours   Max. Marks: 40

Note:
(1) **First question is compulsory attempt any two question from each part.**
(2) **Attempt question in serial order.**

1. Explain Types of Programming. Give example of each type.
                                                                        (8 marks)

                               Part I   (3X8 marks)

2. Write a program for (4X16) Decoder, by using (2X4) Decoder.
3. Write a program for (16X1) Multiplexer by using (4X1) Multiplexer. Use
    generate for the programming.
4. Write a program for BCD adder; also explain the utility of concatenation.

                               Part II   (3X8 marks)

5. Write a program for N-bit SISO/PIPO (both included in the same circuit)
    register.(single universal circuit).
6. Write a program for sequence detector (Moore or Melay) to detect
    consecutive three zeros and two ones. Draw fsm and state diagram.
7. Write a program for (SR or JK) flip-flop.