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15ES51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship Development

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1	a.	Define Management. Explain the various functions of Management.	(08 Marks)
	b.	What is Scientific Management formulated by F.W. Taylor? Explain.	(04 Marks)
	c.	Differentiate between Management and Administration.	(04 Marks)
		OR	
2	a.	Explain the various steps involved in planning.	(08 Marks)
	b.	What are the important characteristics of decision making?	(04 Marks)
	c.	Explain briefly the levels of management.	(04 Marks)

Module-2

3	a.	What are the principles of an organization? Explain.	(08 Marks)
	b.	Explain the importance of Staffing.	(04 Marks)
	c.	What is Leadership? Explain.	(04 Marks)
		OR	
4	a.	Define Directing and explain the steps involved in controlling.	(06 Marks)
	b.	What is Motivation? Explain Maslow's Need Hierarchy Theory.	(06 Marks)
	c.	Explain the centralization of authority with an example.	(04 Marks)

Module-3

5	a.	Define Social responsibility and its responsibility towards other groups.	(08 Marks)
	b.	Explain the term Corporate Governance.	(04 Marks)
	c.	What are the qualities of an Entrepreneur?	(04 Marks)
		OR	
6	a.	Explain the role of Entrepreneurs in the Economic growth of any country.	(06 Marks)
	b.	What are the functions of Entrepreneur? Explain with examples.	(06 Marks)
	c.	Write a note on Women Entrepreneur.	(04 Marks)

Module-4

7	a.	What are the steps involved in setting up of Small Scale Industry (SSI)? Explain.	(08 Marks)
	b.	Explain briefly the objectives of KSFC and TECSOK.	(08 Marks)
		OR	
8	a.	Explain the role of SSI in Economic development of the Country.	(08 Marks)
	b.	Explain the Impact of Globalization on SSI.	(04 Marks)
	c.	Write short note on SIDO.	(04 Marks)

Module-5

9	a.	Define Project. Explain briefly characteristics of project.	(06 Marks)
	b.	Explain briefly the Project Life Cycle.	(06 Marks)
	c.	Differentiate between PERT and CPM.	(04 Marks)
		OR	
10	a.	Explain briefly the steps in PERT with its advantages and limitations.	(08 Marks)
	b.	Explain the phases in Project Management.	(04 Marks)
	c.	Briefly explain the stages of Project Formulation.	(04 Marks)

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15EC52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Digital Signal Processing

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Evaluate 8-point DFT of the sequence :

$$x(n) = \begin{cases} \left(\frac{1}{2}\right)^{n+1}; & -2 \le n \le 2 \\ 0 \quad ; & 3 \le n \le 5 \end{cases}$$

Also draw the magnitude and phase plots. **(12 Marks)**

b. Given $x_1(n) = \delta(n-1) - \delta(n-3)$ and $x_2(n) = \cos\left(\frac{2\pi n}{4}\right)$; $0 \le n \le 3$ perform $x_1(n) \circledast_4 x_2(n)$ using DFT – IDFT method. **(04 Marks)**

OR

2 a. Find the DFT of the sequence (N = 4) $x(n) = \{0, \underset{\uparrow}{5}, 0, 0.5, 0\}$ using Z- transforms. **(04 Marks)**

b. The first five samples of 8-point DFT X(K) are given by X(0) = 6, X(1) = –0.7071 – j1.7071, X(2) = 1 – j, X(3) = 0.7071 + j0.2929, X(4) = 0. Find the remaining samples of X(K) and hence find its time domain sequence x(n). **(10 Marks)**

c. Bring out the differences between linear convolution and circular convolution. **(02 Marks)**

Module-2

3 a. Let x(n) be a finite length sequence with $X(K) = \{0, \underset{\uparrow}{1+j}, 1, 1-j\}$, using the properties of DFT find the DFT's of the following sequences.

i) $x_1(n) = e^{j\frac{\pi}{2}n} x(n)$

ii) $x_2(n) = \cos\{(\pi/2)n\} x(n)$

iii) $x_3(n) = x(4-n)$. **(06 Marks)**

b. Find the output of a FIR filter with impulse response $h(n) = \{\underset{\uparrow}{3}, 2, 1, 1\}$ and the input x(n) = {1, 2, 3, 3, 2, 1, –1, –2, –3, 5, 6, –1, 2, 0, 2, 1}. Use overlap add method using 7 point circular convolution. **(10 Marks)**

OR

4 a. Prove the periodicity and symmetric properties of twiddle factor. **(04 Marks)**

b. Evaluate the function $\sum_{K=0}^{15} e^{\frac{-j4\pi K}{8}} X(K)$ without computing DFT for a given 16-point sequence $x(n) = \{\underset{\uparrow}{3}, 2, 1, 0, 0, 4, -1, -2, -4, 1, 3, 2, -1, 5, 1, 4\}$. **(06 Marks)**

c. State and prove Parsaval's theorem as applied to DFT. **(06 Marks)**

Module-3

5 a. What are the total number of complex additions and multiplications required for 32-point DFT by using direct computation of DFT and by FFT methods? Also find the number of stages required, memory requirement and speed improvement factor by considering multiplication. **(07 Marks)**

b. Find the IDFT of the sequence :

$$X(K) = \{\underset{\uparrow}{36}, -4+j9.7, -4+j4, -4+j1.7, -4, -4-j1.7, -4-j4, -4-j9.7\}$$

Using radix -2 DIF – FFT algorithm. **(09 Marks)**

OR

6 a. Derive radix – 2 DIT –FFT algorithm and draw the complete signal flow graph for N = 8. **(08 Marks)**

b. Explain Goertizel algorithm and obtain the direct from II realization. **(08 Marks)**

Module-4

7 a. A digital filter has input $x(n) = \delta(n) + \frac{1}{4}\delta(n-1) - \frac{1}{8}\delta(n-2)$ and the output $y(n) = \delta(n) - \frac{3}{4}\delta(n-1)$. Realize the filter in direct form – I, direct form – II, cascade and parallel form. **(10 Marks)**

b. Given that $|H(e^{j\Omega})|^2 = \frac{1}{1+64\Omega^6}$, determine the analog Butterworth low pass filter transfer function. **(06 Marks)**

OR

8 a. Compare Butterworth filter with Chebychev filters. **(04Marks)**

b. Design a digital filter H(Z) that when used in an A/D – H(z) – D/A structures given an equivalent analog filter with the following specifications :

Pass band ripple	: ≤ 3.01dB
Pass band edge	: 500Hz
Stop band edge	: 750Hz
Stop band attenuation	: ≥ 15dB

Sample rate f_s = 2KHz and T = 1sec. Use bilinear transformation to design the filter on an analog system. Also obtain the difference equation. **(12Marks)**

Module-5

9 a. Determine the impulse response of a FIR filter with reflection coefficients $K_1 = 0.6$, $K_2 = 0.3$, $K_3 = 0.5$ and $K_4 = 0.9$, also draw the direct form structure. **(12 Marks)**

b. List the advantages of FIR filter over IIR filters. **(04 Marks)**

OR

10 a. Design a FIR lowpass filter with a desired frequency response

$$H_d(e^{j\omega}) = e^{-j3\omega}; \quad \frac{-3\pi}{4} \le \omega \le \frac{3\pi}{4}$$

$$= 0 \; ; \quad \frac{3\pi}{4} < |\omega| < \pi$$

Use Hamming window with m = 7, also obtain the frequency response. **(10 Marks)**

b. Explain the following :

i) Rectangular window
ii) Hamming window
iii) Bartlett window. **(06 Marks)**

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15EC53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Verilog HDL

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain the design flow of VLSI IC circuit steps with a neat flow chart. **(08 Marks)**
b. List the useful features of verilog HDL for hardware design. **(05 Marks)**
c. Explain the importance of HDL compared to traditional schematic based design. **(03Marks)**

OR

2 a. Explain TOP-down methodology applying to design of 4 bit Ripple carry counter. **(08 Marks)**
b. Explain the components of simulation. **(08 Marks)**

Module-2

3 a. Explain any four datatypes in vertilog. **(08 Marks)**
b. Explain in brief the system task and compiler directives. **(08 Marks)**

OR

4 a. Explain the concept of mapping of ports to external signals with one example. **(08 Marks)**
b. Declare top level module stimulus. Define REG – IN(4 bit) and CLK(1 bit) as reg register variables and REG – OUT (4 bit) as wire. Instantiate module shift-reg and call it sr1. Write hierarchical names for variables, REG – IN, CLK and REG – OUT. Also write hierarchical name for instance sr1. **(08 Marks)**

Module-3

5 a. Write a design block and stimulus block for 4 : 1 MUX using gate level modeling. **(08 Marks)**
b. Write a verilog code for function f = (ab + c) with specified delay and also draw neatly the simulated output waveform.(Ref. Fig.Q5(b)).

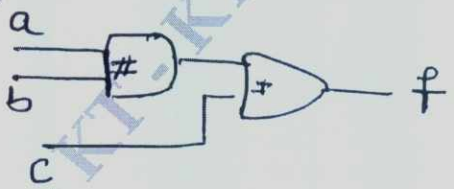

Fig.Q5(b) **(08 Marks)**

OR

6 a. Explain relational, equality and bitwise operators in verilog with example. **(06 Marks)**
b. Write data flow modeling for 4 bit FA with carry look ahead. **(10 Marks)**

Module-4

7 a. Describe multiway branching using case, case X, case Z with example. **(09 Marks)**
b. Write Behavioral modeling for 4 : 1 MUX using case statement. **(07 Marks)**

OR

8 a. Describe while, for, forever statements in verilog with syntax. **(09 Marks)**

b. Write behavioral modeling for 4 bit counter program in verilog. **(07 Marks)**

Module-5

9 a. Explain in brief the design process of using VHDL for design synthesis. **(10 Marks)**

b. Explain the EDA tool flow with neat diagram. **(06 Marks)**

OR

10 a. Discuss the scalar data types used in VHDL. **(08 Marks)**

b. Write a note on atlributes in VHDL. **(08 Marks)**

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15EC54

Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Information Theory and Coding

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define self-information and obtain an expression for entropy of a zero-memory information source emitting independent sequences of symbols. **(08 Marks)**

b. An analog signal is band limited to B Hz and sampled at Nyquist rate. The samples are quantized into 4 levels. Each level represents one message. Thus there are 4 messages. The probability of occurrence of these 4 levels (messages) are $P_1 = P_4 = \frac{1}{8}$ and $P_2 = P_3 = \frac{3}{8}$. Find out information rate of the source. **(08 Marks)**

OR

2 a. Explain Markoff model for information source. **(04 Marks)**

b. Obtain an expression for entropy of Markoff's source. **(04 Marks)**

c. For the first order Markov source with a source alphabet $S = \{A, B, C\}$ shown in Fig. Q2 (c) below. Compute the probabilities of state and entropy of source. **(08 Marks)**

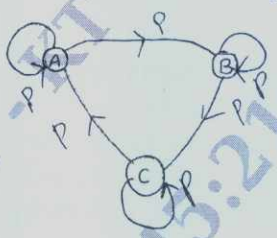


Fig. Q2 (c)

Module-2

3 a. Discuss the various properties of codes. **(04 Marks)**

b. What is Kraft Inequality? Clearly explain with suitable examples. **(06 Marks)**

c. Construct binary code for the following source using Shannon's binary encoding procedure, $S = \{S_1, S_2, S_3, S_4, S_5\}$, $P = \{0.4, 0.25, 0.15, 0.12, 0.08\}$ **(06 Marks)**

OR

4 a. Consider a zero-memory source with,
$S = \{S_1, S_2, S_3, S_4, S_5, S_6, S_7\}$, $P = \{0.4, 0.2, 0.1, 0.1, 0.1, 0.05, 0.05\}$

(i) Construct a binary Huffman code by placing the composite symbol as low as you can.

(ii) Repeat (i) By moving the composite symbol 'as high as possible'.

In each of the cases (i) and (ii) above. Compute the variances of the word-lengths and comment on the result. **(10 Marks)**

b. Compare Huffman coding and Arithmetic coding. **(04 Marks)**

c. State Shannon's first theorem (Noiseless coding theorem). **(02 Marks)**

Module-3

5 a. What is a discrete communication channel? Illustrate the model of a discrete channel. Obtain the equation for P(error) for such a channel. **(08 Marks)**

b. State and discuss Shannon's theorem on channel capacity. **(04 Marks)**

c. For the channel matrix shown below, find the channel capacity, **(04 Marks)**

$$P\left(\frac{b_j}{a_i}\right) = \begin{matrix} & b_1 & b_2 & b_3 \\ a_1 & \frac{1}{2} & \frac{1}{3} & \frac{1}{6} \\ a_2 & \frac{1}{3} & \frac{1}{6} & \frac{1}{2} \\ a_3 & \frac{1}{6} & \frac{1}{2} & \frac{1}{3} \end{matrix}$$

OR

6 a. State and prove Shannon-Hartley law. **(08 Marks)**

b. Discuss Muroga's method for estimating the channel capacity. **(08 Marks)**

Module-4

7 a. Illustrate the following terms used in error control coding with examples, (i) Block length (ii) Code rate (iii) Hamming weight (iv) Hamming distance (v) Minimum distance. **(10 Marks)**

b. What is the use of syndromes? Explain syndrome decoding. **(06 Marks)**

OR

8 a. The parity check matrix of a particular (7, 4) linear block code is given by,

$$[H] = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}.$$

(i) Find the generator matrix (G).
(ii) List all the code vectors.
(iii) What is the minimum distance between code vectors.
(iv) How many errors can be detected? How many errors can be corrected? **(10 Marks)**

b. For a systematic linear block code, the three parity check digits, C_4, C_5 and C_6 are given by

$C_4 = d_1 \oplus d_2 \oplus d_3$, $C_5 = d_1 \oplus d_2$; $C_6 = d_1 \oplus d_3$

(i) Construct the generator matrix.
(ii) Construct the code generated by this matrix. **(06 Marks)**

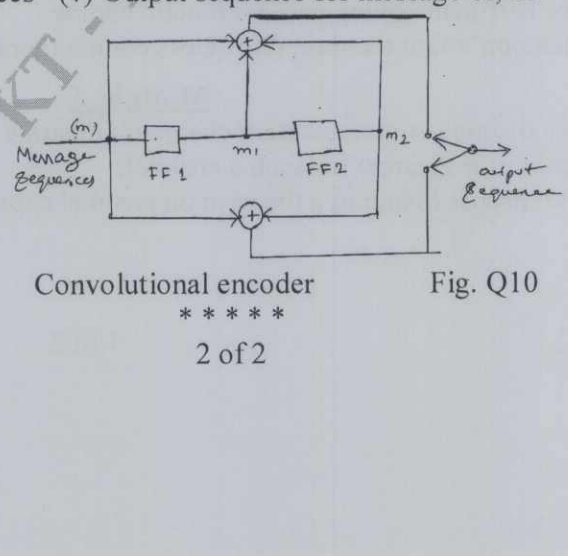
Module-5

9 a. Briefly explain the following codes:
(i) BCH codes (ii) Reed-Soloman codes. (iii) Golay codes. **(08 Marks)**

b. What are convolutional codes? With block diagram explain the operation of convolutional encoder. **(08 Marks)**

OR

10 For the convolutional encoder shown below in Fig.Q10, determine the following:
(i) Dimension of code. (ii) Code rate (iii) Constraint length
(iv) Generating sequences (v) Output sequence for message of, m = {1 0 0 1 1}. **(16 Marks)**



Convolutional encoder Fig. Q10

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15EC553

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Operating Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define Operating System. Explain the functions of an Operation System. **(06 Marks)**

b. Explain goals of an Operating System, its operations and resource allocation of OS. **(10 Marks)**

OR

2 a. Briefly explain the different classes of Operating System, specifying the primary concern and key concepts used. **(10 Marks)**

b. Define the following:
i) System call
ii) Turn-around time
iii) Response time. **(06 Marks)**

Module-2

3 a. Define threads. Compare Kernel level threads and user level threads. **(08 Marks)**

b. Define Process Control Block. Explain the general structure of Process Control Block. **(08 Marks)**

OR

4 a. What do you mean by non preemptive and preemptive scheduling policies? **(04 Marks)**

b. With one example explain:
i) First Come First Serve scheduling
ii) Round Robin Scheduling. **(12 Marks)**

Module-3

5 a. Compare contiguous and non contiguous memory allocation techniques. **(08 Marks)**

b. Explain segmentation with paging. **(08 Marks)**

OR

6 a. List the functions performed by virtual memory handler. **(07 Marks)**

b. With suitable example, explain FIFO and LRU page replacement policies. **(09 Marks)**

Module-4

7 a. With neat diagram, write the logic organization in file system. Also list the facilities provided by the file system and the IOCS. **(08 Marks)**

b. List and explain two approaches to Non Contiguous disk space allocation. **(08 Marks)**

OR

8 a. With example explain sequential and direct access file organization. **(08 Marks)**

b. Explain the different operations performed on files. **(08 Marks)**

Module-5

9 a. Explain the inter process communication mechanism in unix Operating System. **(08 Marks)**

b. Define Mailbox. With an example explain mail box and mention its advantages. **(08 Marks)**

OR

10 a. Define Deadlock. List and explain three events concerning resource allocation to a user process. **(08 Marks)**

b. Write a note on Dead Lock prevention. **(08 Marks)**

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Fifth Semester B.E. Degree Examination, Jan./Feb.2021
Object Oriented Programming Using C++

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Describe, with example the scope resolution operator in C++. **(04 Marks)**
b. Explain preprocessor directive statements with an example. **(04 Marks)**
c. Write C++ program that will ask for a temperature in Fahrenheit and display it in celsius using a class and member functions. **(08 Marks)**

OR

2 a. Summarize the operators in C++. **(04 Marks)**
b. Describe with examples uses of structure data type. **(04 Marks)**
c. Write C++ program that will find a factorial of a number. **(08 Marks)**

Module-2

3 a. Describe function overloading. **(05 Marks)**
b. Show the inline function that obtains the largest of two numbers. **(05 Marks)**
c. Explain the Recursion with example program. **(06 Marks)**

OR

4 a. What are the special characteristics of friend function? **(06 Marks)**
b. Write a C++ program to read two numbers from keyboard and display the larger value on the screen. **(10 Marks)**

Module-3

5 a. Write the C++ program to construct strings in objects using constructors. **(10 Marks)**
b. What are the special characteristics of constructors? **(06 Marks)**

OR

6 a. Write the C++ program for overloading unary minus. **(08 Marks)**
b. Explain the usage of destructors with example program. **(08 Marks)**

Module-4

7 a. Explain the terms in inheritance, (i) private (ii) public (iii) protected. **(06 Marks)**
b. Explain the multilevel inheritance with example program. **(10 Marks)**

OR

8 a. Write C++ program to illustrate the use of 'this' pointer. **(08 Marks)**
b. What is polymorphism? **(02 Marks)**
c. How do we then achieve polymorphism? **(06 Marks)**

Module-5

9 a. Write the stream classes for console operations. **(08 Marks)**
b. Describe about output manipulators. **(08 Marks)**

OR

10 a. Write the C++ program to create files with constructor function. **(10 Marks)**
b. Explain the EOF detection. **(06 Marks)**

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15EC563

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
8051 Microcontroller

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Write the difference between Microprocessor and Microcontroller. **(04 Marks)**

b. Explain the Architecture of 8051 Microcontroller, with neat block diagram. **(08 Marks)**

c. Define Embedded system and write the characteristics of an ES. **(04 Marks)**

OR

2 a. Explain briefly the Internal RAM memory organization in 8051 Microcontroller. **(04 Marks)**

b. Explain the Bit pattern of program status work register. **(04 Marks)**

c. Draw the Memory interfacing circuit to connect a 16K EPROM and an 8K RAM to 8051 Microcontroller. **(08 Marks)**

Module-2

3 a. Explain any five Addressing modes of 8051 Microcontroller with an example each. **(10 Marks)**

b. Explain the following instructions : i) ADD A, @ R1 ii) JNC label iii) DJN2 R_3, up. **(06 Marks)**

OR

4 a. Write and explain the Assembly language program to add two 16 – bit numbers. **(08 Marks)**

b. Explain the Rotate Instructions, with an example. **(08 Marks)**

Module-3

5 a. Explain the Operation of stack with an example. **(04 Marks)**

b. Write and explain an Assembly language program to add Five 8 – bit numbers. **(08 Marks)**

c. Explain any four Assembler directives of an 8051 Microcontroller. **(04 Marks)**

OR

6 a. Write and explain an Assembly Language program to find the smallest number among the given Five 8 – bit numbers. **(08 Marks)**

b. Write and explain an Assembly language program to monitor bit P1.3. Whenever it goes high send a low to high pulse on port P1.5. **(08 Marks)**

Module-4

7 a. Write and explain TMOD and TCON register. **(08 Marks)**

b. Write and explain a Assembly program to generate a square wave at frequency 10KHz on pin 1.4. use timer 0 in mode 2 with a crystal frequency of 22MHz. **(08 Marks)**

OR

8 a. Write and explain SCON register. **(06 Marks)**

b. Write and explain a program in Assembly to transmit a string "UNIVERSITY" serially. Set baud rate at 9600, 8 – bit data and 1 stop bit. **(10 Marks)**

Module-5

9 a. Define an interrupt and write an interrupt vector table. **(06 Marks)**

b. Write a C program using interrupt to generate a 10KHz frequency on P2.1 using Timer 0 in 8 – bit auto reload and count up a 1Hz pulse and display it on Po. The pulse is connected to INT1 pin. Assume that the crystal frequency is 11.0592 MHz **(10 Marks)**

OR

10 a. Write and explain an Assembly language program to display "VTU" on LCD. **(08 Marks)**

b. Write and explain a C program to rotate stepper motor clockwise when switch SW = 0 and rotate in Anti clockwise when switch SW = 1 continuously. **(08 Marks)**

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