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15ES/EI51

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Management & Entrepreneurship Development

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Classify management into three levels. **(03 Marks)**
b. Summarize briefly three types of managerial skills. **(06 Marks)**
c. Analyse management as science and also as an art. **(07 Marks)**

OR

2 a. Define planning. Explain any six limitations of planning. **(07 Marks)**
b. Illustrate and explain different blocks of decision making process. **(09 Marks)**

Module-2

3 a. Select and describe important steps in the process of organizing. **(05 Marks)**
b. Explain the advantages and disadvantages of committees in an organization. **(05 Marks)**
c. Summarize any six types of recruitment process. **(06 Marks)**

OR

4 a. What is direction in an organization? Explain any five techniques of co-ordination. **(06 Marks)**
b. Explain the three basic steps in a control process. **(06 Marks)**
c. List four important characteristics of leadership. **(04 Marks)**

Module-3

5 a. Why is social audit required? **(02 Marks)**
b. Illustrate the social responsibilities of business towards different groups. **(08 Marks)**
c. List out the advantages of corporate governance. **(06 Marks)**

OR

6 a. Explain any four characteristics of successful entrepreneurship. **(08 Marks)**
b. Summarize capacity building for entrepreneurship. **(08 Marks)**

Module-4

7 a. Explain any four roles or importance of Small Scale Industries (SSI) in economic development. **(08 Marks)**
b. Define Ancillary Industry and Tiny Industry. **(04 Marks)**
c. Outline any four reasons for sickness in SSI sector. **(04 Marks)**

OR

8 Summarize any four state level or central level institutions that support small business enterprises. **(16 Marks)**

Module-5

9 a. List out any four characteristics of project. (04 Marks)

b. Classify projects into different types based on various parameters. (05 Marks)

c. What is project formulation? Explain the major steps involved in project formulation. (07 Marks)

OR

10 a. Mention various steps involved in the PERT analysis. (10 Marks)

b. List out the advantages and limitations of CPM. (04 Marks)

c. Show the relation between project design and network using block diagram. (02 Marks)

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15EC52

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
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. Derive the DFT expression from the DTFT. **(04 Marks)**

b. Compute the 'N' point DFT of the sequence
$x(n) = a.n\ 0 \le n \le N-1$. **(06 Marks)**

c. Find the circular convolution between the sequences using DFT and IDFT method
$x_1(n) = (1, 2, 3, 1)$ and $x_2(n) = (4, 3, 2, 1)$ **(06 Marks)**

OR

2 a. State and prove that circular (i) Folding ii) Frequency shift properties of an 'N' point sequence. **(06 Marks)**

b. Consider the finite length sequence $x(n) = \delta(n) + 2\delta(n-j)$ Find :
(i) 10 point DFT of x(n)
(ii) $y(k) = e^{-j\left(\frac{4\pi k}{10}\right)} X(k)$ where X(k) is 10 point DFT of x(n) find y(n)
(iii) Find z(n) that has DFT $z(k) = X(k).w(k)$ where w(k) is the 10 point DFT of $w(n) = u(n) - u(n-7)$ **(07 Marks)**

c. Let x(n) be a finite length sequence with $x(k) = \{1, 4j, 0, -4j\}$, find the DFT's of
(i) $x_1(n) = e^{j\frac{\pi}{2}n} x(n)$ (ii) $x_2(n) = \cos\left(\frac{\pi}{2}n\right) x(n)$ (iii) $x_3(n) = x((n-1)_4)$ **(03 Marks)**

Module-2

3 a. Explain the disadvantages of direct computation of DFT and advantage of FFT. **(04 Marks)**

b. Find the output y(n) of a filter whose impulse response $h(n) = \{3, 2, 1\}$ and input $x(n) = \{2, 1, -1, -2, -3, 5, 6, -1, 2, 0, 2, 1\}$. Using overlap and save method. Use 8 point circular convolution in your approach. **(10 Marks)**

c. State and prove symmetric property of twiddle factor w_N. **(02 Marks)**

OR

4 a. Find the number of complex multiplications and additions required to computer 128 point DFT using (i) Direct method (ii) FFT (iii) what is the speed improvement factor (iv) Number of real registers needed (v) Number of trigonometric functions needed. **(06 Marks)**

b. A long sequence x(n) is filtered with a filter with impulse response h(n) to produce output y(n). If $x(n) = \{1, 4, 3, 0, 7, 4, -7, -7, -1, 3, 4, 3\}$ and $h(n) = \{1, 2\}$. Compute y(n) using overlap and add method. Use only 5 point circular convolution in your approach. **(10 Marks)**

Module-3

5 a. Develop 8 point DIT-FFT radix – 2 algorithm and draw the signal flow graph. **(08 Marks)**

b. Find the 8 point DFT of the sequence $x(n) = \{1, 1, 1, 1, 0, 0, 0, 0\}$ using radix – 2 DIF FFT algorithm. **(08 Marks)**

OR

6 a. Find the 4 point circular convolution of x(n) and h(n) given below using radix – 2 DIT FFT algorithm. x(n) = {1, 1, 1, 1} h(n) = {1, 0, 1, 0}. **(06 Marks)**

b. First five points of 8-point DFT's of a real valued sequence is given by x(0) = 0 x(1) = 2 + 2j, x(2) = -4j, x(3) = 2 – 2j, x(4) = 0. Determine the remaining points. Hence find the sequence x(n) using radix – 2 DIT FFT algorithm. **(10 Marks)**

Module-4

7 a. Compare Butterworth and Chebyshev filters. **(04 Marks)**

b. Design an analog lowpass Butterworth filter for the following specifications $0.8 \le |H_a(s)| \le 1, 0 \le \Omega \le 0.2\pi,\ |H_a(s)| \le 0.2, 0.6\pi \le \Omega \le \pi$. **(08 Marks)**

c. Explain Analog to Analog transformation. **(04 Marks)**

OR

8 a. Design a digital lowpass filter using BLT to satisfy the following chart.

i) Monotonic pass and stop band
ii) -3dB cut –off of 0.5π rad
iii) Magnitude down atleast 15dB at 0.75π rad **(08 Marks)**

b. Find H(z) for the given T.F $H(s) = \frac{s+a}{(s+a)^2 + b^2}$ using Impulse Invariant Transformation (IIT) technique. **(08 Marks)**

Module-5

9 a. Obtain direct form – I, Form – II, Cascade and parallel form of realization for the following system. y(n) = 0.75 y(n – 1) – 0.125 y(n – 2) + 6x(n) + 7x (n – 1) + x(n – 2). **(12 Marks)**

b. Realize an FIR filter given by $h(n) = \left(\frac{1}{2}\right)^n [u(n) - u(n-4)]$ using direct form – I. **(04 Marks)**

OR

10 a. Write equations of any four different windows used in design of FIR filters. **(10 Marks)**

b. Design the symmetric FIR, lowpass filter whose desired frequency response is given as

$$H_d(w) = \begin{cases} e^{-jw\tau} & \text{for } |w| \le w_c \\ 0 & \text{otherwise} \end{cases}$$

The length of the filter should be 7 and w_c = 1 radian/sample use rectangular window. **(06 Marks)**

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15EC53

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
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 top-down design methodology with an example. **(06 Marks)**

b. Explain the typical design flow for designing VLSI IC circuits, with a neat flow chart. **(10 Marks)**

OR

2 a. Explain Bottom-up design methodology with an example. **(06 Marks)**

b. Explain the different levels of abstraction used for programming in verilog. **(10 Marks)**

Module-2

3 a. Explain system tasks and compiler directives in verilog. **(06 Marks)**

b. What are the basic components of a module? Explain all the components of a verilog module with a neat block diagram. **(06 Marks)**

c. Write verilog description of SR Latch. Also write stimulus code. **(04 Marks)**

OR

4 a. Write a note on: i) Registers ii) Nets iii) Arrays iv) Parameters v) Vectors vi) Memories. **(12 Marks)**

b. Declare a top-level module "Stimulus". Define Reg_in (4 bit) and Clk (1 bit) as register variables and Reg_out (4 bits) as wire. Instantiate the module "shift-reg" in "stimulus" block and connect the ports by ordered list. Declare A (4 bit) and clock (1 bit) as inputs and B (4 bit) as output in "shift-reg" module. (No need to show internals). Write a verilog code for the above. **(04 Marks)**

Module-3

5 a. Write the verilog description of 4 bit ripple carry adder at gate level abstraction, with a neat block diagram. Also, write stimulus block. **(08 Marks)**

b. What would be the output of the following:

a = 4'b1010, b = 4'b1111

i) a & b ii) a && b iii) & a iv) a >> 1 v) a >>> 1 vi) y = {2{a}}

vii) a ∧ b viii) z = {a, b}. **(08 Marks)**

OR

6 a. A full subtractor has three 1-bit inputs x, y and z (previous borrow) and two 1-bit outputs D(Difference) and B(Borrow). The logic equations are

$D = \bar{x}\bar{y}z + \bar{x}y\bar{z} + x\bar{y}\bar{z} + xyz$

$B = \bar{x}y + \bar{x}z + yz$

Write verilog description using dataflow modeling. Instantiate the subtractor module inside a stimulus block and test all possible combinations of inputs x, y and z. **(08 Marks)**

b. Design 4:1 multiplexer using gate level modeling or structural description. Write stimulus block. **(08 Marks)**

Module-4

7 a. Explain structured procedure statements in verilog. **(06 Marks)**
b. Write a verilog behavioral 8:1 multiplexer program using case statement. **(06 Marks)**
c. Explain casex and casez statements in verilog. **(04 Marks)**

OR

8 a. Explain procedural assignment statements in verilog. **(06 Marks)**
b. Explain sequential and parallel blocks with examples. **(06 Marks)**
c. Write a verilog code to find the first bit with a value 1 in Flag = 16'b 0010_0000_0000_0000. **(04 Marks)**

Module-5

9 a. Explain the design tool flow followed in VLSI design with a neat flow diagram. **(10 Marks)**
b. Write VHDL Data flow description of 1 Bit full Adder. **(06 Marks)**

OR

10 a. Explain the relationship between a design entity and its entity declaration and architecture body in VHDL. **(10 Marks)**
b. Write VHDL structural description of 1 Bit Full Adder. **(06 Marks)**

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15EC54

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Information Theory and Coding

Time: 3 hrs. Max. Marks: 80

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

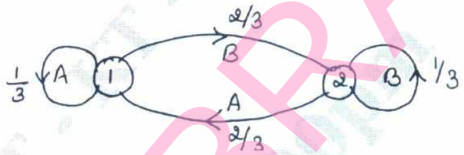
Module-1

1 a. The output of an information source contains 160 symbols, 128 of which occur with a probability of $\frac{1}{256}$ and remaining with a probability of $\frac{1}{64}$ each. Find the average information rate of the source if the source emits 10,000 sym/s. **(02 Marks)**

b. In a facsimile transmission of a picture, there are 4×10^6 pixels/frame. For a good reconstruction of the image atleast eight brightness levels are necessary. Assuming all these levels are equally likely to occur. Find the average information rate if one picture is transmitted every 4s. **(04 Marks)**

c. Consider the following Markov source shown in fig. Q1(c). Find i) State probabilities ii) State entropies iii) Source entropy iv) G_1, G_2 v) Show that $G_1 > G_2 > H$. **(10 Marks)**

Fig.Q1(c)



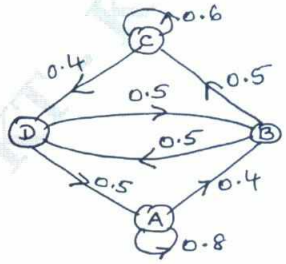
OR

2 a. The international Morse code uses a sequence of symbols of dots and dashes to transmit letters of English alphabet. The dash is represented by a current pulse of duration 2ms and dot of 1ms. The probability of dash is half as that of dot. Consider 1ms duration of gap is given in between the symbols. Calculate i) Self – information of a dot and a dash ii) Average information content of a dot – dash code iii) Average rate of information. **(06 Marks)**

b. State the properties of Entropy. **(04 Marks)**

c. Consider the Markov source shown in fig. Q2(c). find i) State probabilities ii) State entropies iii) Source entropy. **(06 Marks)**

Fig.Q2(c)



Module-2

3 a. With an example, explain Prefix codes. **(04 Marks)**

b. Consider the following source S = {A, B, C, D, E} with probabilities P = {0.5, 0.25, 0.125, 0.0625, 0.0625}. Find the code words for the symbols using Shannon's encoding algorithm. Also, find the source efficiency and redundancy. **(06 Marks)**

c. An information source produces a sequence of independent symbols having the following probabilities. Construct binary code using Huffman encoding and find its efficiency. **(06 Marks)**

A	B	C	D	E	F	G
1/3	1/27	1/3	1/9	1/9	1/27	1/27

OR

4 a. State Kraft McMillan Inequality property. **(04 Marks)**

b. Consider a discrete memory less source with S = (X, Y, Z) with the corresponding probabilities P = (0.5, 0.3, 0.2). Find the code words for the symbols using Shannon's algorithm. Also, find the source efficiency and redundancy. **(06 Marks)**

c. Consider a discrete memory less source with S = (X, Y, Z) with respective probabilities P = (0.6, 0.2, 0.2). Find the codeword for the message 'YXZXY' using arithmetic coding. **(06 Marks)**

Module-3

5 a. A binary channel has the following characteristics

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

. If input symbols are transmitted with probabilities ¾ and ¼ respectively. Find entropies, H(X) , H(X, Y) and H(Y/X). **(03 Marks)**

b. Prove that the mutual information is always a non - negative entity $I(X ; Y) \geq 0$. **(06 Marks)**

c. The noise characteristics of a channel are as shown in fig.Q5(c). Find the capacity of the channel using Muroga's method. **(07 Marks)**

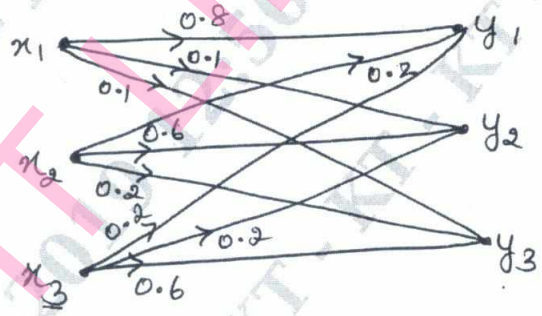


Fig.Q5(c)

OR

6 a. State the properties of Joint Probability Matrix. **(04 Marks)**

b. Find the mutual information for the channel shown in fig.6(b). Let $P(x_1) = 0.6$ and $P(x_2) = 0.4$. **(06 Marks)**

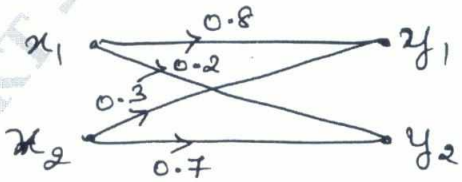


Fig.Q6(b)

c. Derive the expression for the channel capacity of a Binary Symmetric Channel. **(06 Marks)**

Module-4

7 a. For a (6, 3) code find all the code vectors if the co-efficient matrix P is given by

$$P = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

i) Find code vector ii) Implement the encoder iii) Find the syndrome vector (S). iv) Implement the syndrome circuit. **(08 Marks)**

b. Obtain the generator and parity check matrices for an (n, k) cyclic code with $g(x) = 1+x+x^3$. **(08 Marks)**

OR

8 a. In an LBC, the syndrome is given by

$S_1 = r_1 + r_2 + r_3 + r_5$; $S_2 = r_1 + r_2 + r_4 + r_6$; $S_3 = r_1 + r_3 + r_4 + r_7$.

i) Find the parity check matrix (H) ii) Draw the encoder circuit

iii) Find the code word for all input sequences.

iv) What is the syndrome for the received data 1011011? **(08 Marks)**

b. In a (15,5) cyclic code, the generator polynomial is given by $g(x) = 1+x+ x^2+x^4+x^5+ x^8+ x^{10}$. Draw the block diagram of an encoder and syndrome calculator for this code. Find whether $r(x) = 1+ x^4 + x^6 + x^8 + x^{14}$ a valid code word. **(08 Marks)**

Module-5

9 a. Design a (15,7) binary BCH code with r = 2. **(06 Marks)**

b. Consider the (3, 1, 2) convolution code with $g^{(1)} = (1\ 1\ 0)$, $g^{(2)} = (1\ 0\ 1)$, $g^{(3)} = (1\ 1\ 1)$.

i) Find the constraint length ii) Find the rate iii) Draw the encoder block diagram

iv) Find the generator matrix v) Find the code word for the message sequence (1 1 1 0 1) using time – domain and transfer – domain approach. **(10 Marks)**

OR

10 a. Explain why (23, 12) Golay code is called as perfect code. **(04 Marks)**

b. Consider the convolution encoder shown in fig. Q10(b).

i) Write the impulse response of the encoder.

ii) Find the output for the message (1 0 0 1 1) using time – domain approach.

iii) Find the output for the message (1 0 0 1 1) using transfer – domain approach. **(12 Marks)**

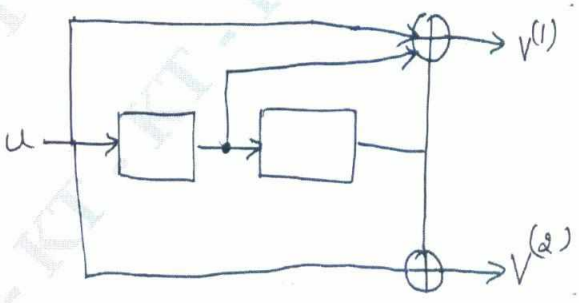


Fig.Q10(b)

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15EC553

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
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 key concerns of an operating system. **(10 Marks)**
b. Explain the different computational structures of operating system. **(06 Marks)**

OR

2 a. Explain different classes of operating system. **(10 Marks)**
b. Explain various resource allocation strategies. **(06 Marks)**

Module-2

3 a. Define process, process states and transition with suitable algorithm. **(08 Marks)**
b. Explain Process Control Block. **(08 Marks)**

OR

4 a. For a given set of process FCFS and SRN scheduling compare their performance in terms of mean turnaround time and weighted turnaround time. **(10 Marks)**

Process	P_1	P_2	P_3	P_4	P_5
Admission time	0	2	3	5	9
Service time	3	3	2	5	3

b. Explain long-term and short term scheduling. **(06 Marks)**

Module-3

5 a. Compare contiguous and non-contiguous memory allocation techniques. **(08 Marks)**
b. Write a short note on : i) paging ii) segmentation. **(08 Marks)**

OR

6 a. Explain demand paging preliminaries. **(10 Marks)**
b. Write short note on :
i) First–In–First–Out (FIFO) page replacement policy. **(03 Marks)**
ii) Least Recently Used (LRU) page replacement policy. **(03 Marks)**

Module-4

7 a. Explain file system and IOCS. **(08 Marks)**
b. Explain fundamental file organizations. **(08 Marks)**

OR

8 a. Explain directory structures. **(08 Marks)**
b. Explain file system action at a file operation. **(08 Marks)**

Module-5

9 a. Define message passing. Explain how to implement the message passing. **(08 Marks)**
b. Explain mail boxes and message passing in unix. **(08 Marks)**

OR

10 a. Define deadlock. Explain deadlock in resource allocation. **(08 Marks)**
b. Explain deadlock detection algorithm. **(08 Marks)**

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15EC562

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
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. What is C++? List the applications of C++. **(04 Marks)**

b. Describe the structure of a C++ program with an example. **(08 Marks)**

c. When do we use cascading of input/output operators? Give example. **(04 Marks)**

OR

2 a. Write a C++ program to find the sum of digits of a given number.
e.g If input number = 16738
output is 25 i.e. 1 + 6 + 7 + 3 + 8. **(04 Marks)**

b. Explain the different types of expressions in C++. Give examples for each type. (any four) **(08 Marks)**

c. With an example, describe the purpose of new and delete operators in C++. **(04 Marks)**

Module-2

3 a. Mention the restrictions posed by the complier on inline functions. **(04 Marks)**

b. Design a class 'triangle' containing data items 'base' 'height' and four member functions setdata( ), getdata( ), displaydata( ) and findarea( ), to set values to 'base' and 'height', to get the user input, to display and find area of triangle (i.e. ½ * base*height) respectively. Write the main function which creates the object and uses the members of the class. **(08 Marks)**

c. Discuss the different types of function overloading in C++. **(04 Marks)**

OR

4 a. When do we use default arguments? State the rules that need to be followed while using default arguments. **(04 Marks)**

b. Draw a neat diagram and explain the process of memory allocation to objects in C++. **(06 Marks)**

c. Develop a C++ program to define two classes namely husband and wife that hold a private member 'salary' respectively. Calculate and display the total income of the family using friend function. **(06 Marks)**

Module-3

5 a. How are constructors differ from member functions of a class? **(04 Marks)**

b. What is operator overloading? Give syntax and example. List the operators that cannot be overloaded. **(06 Marks)**

c. Explain the significance of friend functions to overload operators. **(06 Marks)**

OR

6 a. Discuss the importance of dynamic constructors and destructor in a C++ class. **(08 Marks)**

b. Write a C++ program to add two complex numbers by overloading the + operator. Also overload << and >> operators for reading and displaying the complex numbers. **(08 Marks)**

Module-4

7 a. What is inheritance? List its advantages. **(04 Marks)**
b. Explain the visibility inheritance modes. Give an example. **(08 Marks)**
c. Compare multiple inheritances with multilevel inheritance. **(04 Marks)**

OR

8 a. What is abstract class? Give an example. **(04 Marks)**
b. Demonstrate the working of pointers as objects with a relevant example. **(08 Marks)**
c. State the differences between virtual and pure virtual functions. **(04 Marks)**

Module-5

9 a. What is a data stream? Describe the hierarchy of file stream classes in C++. **(08 Marks)**
b. Explain the following unformatted I/O functions : i) getline( ) ii) write( ). **(04 Marks)**
c. Compare and contrast width( ) and setw( ). **(04 Marks)**

OR

10 a. How file opening and closing is done? What are the functions required for reading and writing data in a file. Explain with an example. **(08 Marks)**
b. Create a C++ program to read a text file and find number of characters, words and lines in a file. **(08 Marks)**

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15EC563

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
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. What is a micro controller? Mention its applications. **(04 Marks)**

b. With a neat block diagram explain the features of 8051 microcontroller. **(06 Marks)**

c. Mention the internal RAM organization in 8051 microcontroller. **(06 Marks)**

OR

2 a. With a neat functional block diagram explain the architecture of 8051. **(08 Marks)**

b. Design a micro controller system using 8051 microcontroller, 4 kbytes of ROM and 8k bytes of RAM interface the external memory such that the starting address of ROM is 1000 H and RAM is C000H. **(08 Marks)**

Module-2

3 a. Explain any 4 different addressing modes used in 8051 microcontroller with suitable illustrations. **(08 Marks)**

b. Explain the following instructions with examples.

i) DJNZ Rn, rel

ii) JNC rel

iii) ANL A, R_n

iv) DA A. **(08 Marks)**

OR

4 a. Write 8051 instructions to rotate the contents of A left by two positions. **(08 Marks)**

b. Write 8051 instructions to add two BCD numbers and store the result in BCD in register R_1. **(08 Marks)**

Module-3

5 a. Write a program to find the smallest number of an array of N-8 bit unsigned numbers. The starting address is at 2000h and store the result in 2500H. **(08 Marks)**

b. Write a program to count the numbers of 1's and 0's in 8 bit data stored. **(08 Marks)**

OR

6 a. Write a program to arrange the numbers in ascending order. **(08 Marks)**

b. Write a program to create a delay of 1sec. Assume that the oscillator frequency is 1.2 MHz. **(08 Marks)**

Module-4

7 a. Explain the jump and CALL program range with reference to 8051 microcontroller. **(06 Marks)**

b. Write a program to find the factorial of a number. **(06 Marks)**

c. Write a program to move a block of data stored in external memory location 9000h to a location starting from F000h (without overlapping). **(04 Marks)**

OR

8	a.	Explain the role of CALL and subroutines in 8051 microcontroller programming.	(04 Marks)
	b.	What are timers and counters? Explain its operations.	(06 Marks)
	c.	Explain timer control register and timer mode control register.	(06 Marks)

Module-5

9	a.	Explain the 8051 S-CON register.	(08 Marks)
	b.	Write a 8051 subroutine program to initialize 8051 serial port to operate in mode 0 for transmission.	(04 Marks)
	c.	Explain RS – 232 standards.	(04 Marks)

OR

10	a.	Bring out the difference between interrupts and polling.	(04 Marks)
	b.	Explain interrupt priority register of 8051 microcontroller.	(04 Marks)
	c.	Write an 8051 C program to send letters 'M', 'D' and E to the LCD using delays.	(08 Marks)

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