IV EC, EE (S)

CBCS Scheme

USN | | | | | | | | | | 15ES51

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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 management functions. **(08 Marks)**
b. Differentiate between management and administration. **(04 Marks)**
c. Explain decisional roles of a manager. **(04 Marks)**

OR

2 a. Explain steps involved in planning. **(08 Marks)**
b. Explain steps involved in rational decision making. **(08 Marks)**

Module-2

3 a. Define organization. Explain process of organizing. **(07 Marks)**
b. Define committee. Explain its types. **(05 Marks)**
c. Explain importance and need for proper staffing. **(04 Marks)**

OR

4 a. Explain the requirements of effective direction. **(05 Marks)**
b. Explain behavioural approach to leadership. **(07 Marks)**
c. Explain the benefits of effective control. **(04 Marks)**

Module-3

5 a. What is social audit? Explain its benefits and limitations. **(08 Marks)**
b. What is corporate governance? List the benefits of good corporate governance. Who monitor corporate governance in India? **(08 Marks)**

OR

6 a. Define entrepreneurship. Explain importance of entrepreneurship. **(05 Marks)**
b. Explain entrepreneurial development model. **(07 Marks)**
c. List the problems faced by entrepreneurs. **(04 Marks)**

Module-4

7 a. Explain the role of small scale industries in economic development. **(05 Marks)**
b. Explain the impact of globalization on SSI. **(06 Marks)**
c. Explain the problems faced by small scale industries in India. **(05 Marks)**

OR

8 a. What is National Small Industries Corporation Ltd.? How it supports SSI in India? **(08 Marks)**
b. What is District Industrial Centre? How it supports SSI? **(08 Marks)**

Module-5

9 a. Define project. Explain product planning and development process. **(08 Marks)**
b. Explain sequential stages of project formulation. **(08 Marks)**

OR

10 a. Explain the importance of Network analysis during project execution. **(06 Marks)**
b. Explain the differences between PERT and CPM. **(10 Marks)**

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CBCS Scheme

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15EC52

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. Define DFT and IDFT of a signal obtain the relationship between of DFT and z – transform. **(06 Marks)**

b. Compute circular convolution using DFT and IDFT for the following sequences, $x_1(n) = \{2, 3, 1, 1\}$ and $x_2(n) = \{1, 3, 5, 3\}$. **(10 Marks)**

OR

2 a. The first five samples of the 8 – point DFT x(k) are given as follows : $x(0) = 0.25$, $x(1) = 0.125 - j0.3018$, $x(4) = x(6) = 0$, $x(5) = 0.125 - j0.0518$. Determine the remaining samples, if the x(n) is real valued sequence. **(04 Marks)**

b. State and prove the circular time shift and circular frequency shift properties. **(06 Marks)**

c. If $x(n) = \{1, 2, 0, 3, -2, 4, 7, 5\}$, evaluate the following :

i) x(0) ii) x(4) iii) $\sum_{n=0}^{7} x(k)$. **(06 Marks)**

Module-2

3 a. State and prove the following properties of phase factor ω_N.

i) periodicity

ii) symmetry. **(04 Marks)**

b. Find the output y(n) of a filter whose impulse suppose $h(n) = \{1, 2, 3, 4\}$ and input signal to the filter is $x(n) = \{1, 2, 1, -1, 3, 0, 5, 6, 2, -2, -5, -6, 7, 1, 2, 0, 1\}$ using overlap – add method with 6-point circular convolution. **(12 Marks)**

OR

4 a. In the direct computation of N-point DFT of x(n), how many :

i) Complex additions

ii) Complex multiplications

iii) Real multiplication

iv) Real additions

v) Trigonometric functions

Evaluations are required? **(06 Marks)**

b. Explain the linear filtering of long data sequences using overlap – save method. **(10 Marks)**

Module-3

5 a. Given $x(n) = \{1, 0, 1, 0\}$, find x(2) using Goertzel algorithm. **(06 Marks)**

b. Find the 8-point DFT of the sequence $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ using DIT – FFT radix – 2 algorithm. **(10 Marks)**

OR

6 a. What is chirp–z transform? Mention its applications? **(06 Marks)**

b. Find the 4-point circular convolution of x(n) and h(n) give below, using radix–2. DIF–FFT algorithm.

$x(n) = \{1, 1, 1, 1\}$

$h(x) = \{1, 0, 1, 0\}$. **(10 Marks)**

Module-4

7 a. Derive an expression for the order, cut of frequency and poles of the low pass Butterworth filter. **(08 Marks)**

b. A Butterworth low pass filter has to meet the following s specifications.

i) Pass band gain, $k_p = -1$dB at $\Omega_p = 4$ rad/sec

ii) Step band alternations greater than or equal to 20dB at $\Omega_s = 8$rad/sec

Determine the transfer function $H_a(s)$ of the Butterworth filter to meet the above specifications. **(08 Marks)**

OR

8 a. A third –order Butterworth low pass filter has the transfer function :

$$H(s) = \frac{1}{(s+1)(s^2+s+1)}$$

Design H(z) using impulse invariant technique. **(10 Marks)**

b. List the advantages and disadvantages of IIR filters. **(06 Marks)**

Module-5

9 a. A linear time – invariant digital IIR filter is specified by the following transfer function :

$$H(z) = \frac{(z-1)(z-2)(z+1)z}{\left[z-\left(\frac{1}{2}+\frac{1}{2}j\right)\right]\left[z-\left(\frac{1}{2}-j\frac{1}{2}\right)\right]\left[z-j\frac{1}{4}\right]\left[z+j\frac{1}{4}\right]}$$

Realize the system in the following forms : i) direct form – I ii) Direct form –II. **(12 Marks)**

b. Obtain a cascade realization for the system function given below :

$$H(z) = \frac{\left(1+z^{-1}\right)^3}{\left(1-\frac{1}{4}z^{-1}\right)\left(1-z^{-1}+\frac{1}{2}z^{-2}\right)}.$$ **(04 Marks)**

OR

10 a. Explain the following terms :

i) Rectangular window

ii) Bartlett window

iii) Hamming window. **(08 Marks)**

b. A filter is to be designed with the following desired frequency response :

$$H_d(\omega) = \begin{cases} 0, & -\pi/4 < \omega < \pi/4 \\ e^{-j2\omega}, & \pi/4 < |\omega| < \pi \end{cases}$$

Find the frequency response of the FIR filter designed using rectangular window defined below :

$$\omega_R(n) = \begin{cases} 1, & 0 \le n \le 4 \\ 0, & \text{otherwise} \end{cases}.$$ **(08 Marks)**

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CBCS SCHEME

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15EC53

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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 a typical design flow for designing VLSI IC circuit using the block diagram. **(06 Marks)**

b. Explain top down design methodology and bottom up design methodology. **(10 Marks)**

OR

2 a. With a block diagram of 4-bit Ripple carry counter, explain the design hierarchy. **(10 Marks)**

b. Explain the trends in Hardware Description Languages (HDLs). **(06 Marks)**

Module-2

3 a. With a neat block diagram, explain the components of verilog module. **(06 Marks)**

b. Explain the following data types with an example in verilog:
(i) Nets (ii) Register (iii) Integers (iv) Real (v) Time Register. **(10 Marks)**

OR

4 a. Explain the port connection rules. **(06 Marks)**

b. Explain the two methods of connecting ports to external signals with an example. **(10 Marks)**

Module-3

5 a. What are Rise, Fall and Turn-off delays? How they are specified in verilog? **(06 Marks)**

b. Design a 2-to-1 multiplexer using bufifo and bufifl gates. The delay specification for these gates are as follows:

Delay	Min	Typ	Max.
Rise	1	2	3
Fall	3	4	5
Turn-off	5	6	7

Write gate level description and stimulus in verilog. **(10 Marks)**

OR

6 a. Write a verilog dataflow level of abstraction for 4-to-1 multiplexer using conditional operator. **(06 Marks)**

b. Write a verilog dataflow description for 4-bit Full adder with carry lookahead. **(10 Marks)**

Module-4

7 a. Explain the blocking assignment statements and non-blocking assignment statements with relevant examples. **(08 Marks)**

b. Write a note on the following loop statements:
(i) While loop (ii) forever loop. **(08 Marks)**

OR

8 a. Explain sequential and parallel blocks with examples. **(08 Marks)**

b. Write a verilog program for 8-to-1 multiplexer using case statement. **(08 Marks)**

Module-5

9 a. Explain the synthesis process with a block diagram. **(08 Marks)**

b. Write a VHDL program for two 4-bit comparator using data flow description. **(08 Marks)**

OR

10 a. Explain the declaration of constant, variable and signal in VHDL with example. **(08 Marks)**

b. Write a VHDL program for half adder in behavioral description. **(08 Marks)**

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15EC54

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Information Theory and Coding

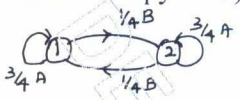
Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Derive an expression for average information content of symbols in long independent sequence. **(03 Marks)**

b. For the Markov source shown below, find i) The stationary distribution ii) State entropies iii) Source entropy iv) G_1 G_2 and show that $G_1 \geq G_2 \geq H(s)$. **(10 Marks)**



c. Define Self Information, Entropy and Information rate. **(03 Marks)**

OR

2 a. Mention different properties of entropy and prove external property. **(07 Marks)**

b. A source emits one of the four symbols S_1 S_2 S_3 and S_4 with probabilities of $\frac{7}{16}$, $\frac{5}{16}$, $\frac{1}{8}$ & $\frac{1}{8}$. Show that $H(S^2) = 2H(S)$. **(04 Marks)**

c. In a facsimile transmission of a picture, there are about 2.25×10^6 pixels/frame. For a good reproduction at the receiver 12 brightness levels are necessary. Assume all these levels are equally likely to occur. Find the rate of information if one picture is to be transmitted every 3 min. Also compute the source efficiency. **(05 Marks)**

Module-2

3 a. A discrete memory less source has an alphabet of five symbols with their probabilities as given below : **(10 Marks)**

Symbol	S_0	S_1	S_2	S_3	S_4
Probabilities	0.55	0.15	0.15	0.1	0.05

Compute Huffman code by placing composite symbol as high as possible and by placing composite symbol as low as possible. Also find i) The average codeword length ii) The variance of the average code word for both the cases.

b. Using Shannon Fano – coding, find code words for the probability distribution $P = \left\{\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{8}\right\}$. Find average code word length and efficiency. **(06 Marks)**

OR

4 a. Write a short note on Lempel Ziv algorithm. **(05 Marks)**

b. Derive Source coding theorem. **(05 Marks)**

c. Apply Shannon's encoding algorithm and generate binary codes for the set of messages given below. Also find variance, code efficiency and redundancy. **(06 Marks)**

M_1	M_2	M_3	M_4	M_5
1/8	1/16	3/16	1/4	3/8

Module-3

5 a. Find the capacity of the discrete channel whose noise matrix is **(04 Marks)**

$$P\left(\frac{y}{x}\right) = \begin{bmatrix} 0.8 & 0.2 & 0 \\ 0.1 & 0.8 & 0.1 \\ 0 & 0.2 & 0.8 \end{bmatrix}$$

b. Define Mutual Information. List the properties of Mutual information and prove that $I(x ; y) = H(x) + H(y) - H(xy)$ bits/system. **(06 Marks)**

c. A channel has the following characteristics :

$$P\left(\frac{y}{x}\right) = \begin{bmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{6} & \frac{1}{6} \\ \frac{1}{6} & \frac{1}{6} & \frac{1}{3} & \frac{1}{3} \end{bmatrix} \text{ \& } P(x_1) = p(x_2) = \frac{1}{2}.$$ Find H(x) , H(y) , H(x, y) and Channel capacity if r =1000 symbols/sec. **(06 Marks)**

OR

6 a. A binary symmetric channel has the following noise matrix with source probabilities of

$$P(x_1) = \frac{2}{3} \text{ and } P(x_2) = \frac{1}{3} \text{ and } P\left(\frac{y}{x}\right) = \begin{bmatrix} \frac{3}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{3}{4} \end{bmatrix}.$$ **(08 Marks)**

i) Determine H(x) , H(y) , H(x, y) , H(y/x) , H(x/y) and I(x, y).
ii) Find channel capacity C. iii) Find channel efficiency and redundancy.

b. Derive an expression for channel efficiency for a Binary Erasure channel. **(05 Marks)**

c. Write a note on Differential Entropy. **(03 Marks)**

Module-4

7 a. For a systematic (6.3) linear block code generated by $C_4 = d_1 \oplus d_3$, $C_5 = d_2 \oplus d_3$, $C_6 = d_1 \oplus d_2$.

i) Find all possible code vectors ii) Draw encoder circuit and syndrome circuit
iii) Detect and correct the code word if the received code word is 110010.
iv) Hamming weight for all code vector, min hamming distance. Error detecting and correcting capability. **(14 Marks)**

b. Define the following : i) Block code and Convolutional code ii) Systematic and non – systematic code. **(02 Marks)**

OR

8 a. A linear Hamming code for (7, 4) is described by a generator polynomial $g(x) = 1 + x + x^3$. Determine Generator Matrix and Parity check matrix. **(03 Marks)**

b. A generator polynomial for a (15, 7) cyclic code is $g(x) = 1 + x^4 + x^6 + x^7 + x^8$.

i) Find the code vector for the message $D(x) = x^2 + x^3 + x^4$. Using cyclic encoder circuit.
ii) Draw syndrome calculation circuit and find the syndrome of the received polynomial $Z(x) = 1 + x + x^3 + x^6 + x^8 + x^9 + x^{11} + x^{14}$. **(13 Marks)**

Module-5

9 a. Consider the (3, 1, 2) convolutional code with $g_1 = 110$, $g_2 = 101$, $g_3 = 111$. **(12 Marks)**

i) Draw the encoder block diagram ii) Find the generator matrix
iii) Find the code word corresponding to the information sequence 11101 using time domain and transform Domain approach.

b. Write short note on BCH code. **(04 Marks)**

OR

10 For a (2,1, 3) convolutional encoder with $g_1 = 1011$, $g_2 = 1101$. **(16 Marks)**

a. Draw the state diagram b. Draw the code tree.
c. Draw trellis diagram and code word for the message 1 1 1 0 1.
d. Using Viterbi decoding algorithm decode the obtained code word if first bit is erroneous.

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CBCS Scheme

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15EC553

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. What are the goals of an operating system? Explain. **(08 Marks)**

b. List and explain the different computational structures of operating system. **(08 Marks)**

OR

2 a. What are the different classes of operating system? Explain them with their primary concern. **(10 Marks)**

b. Explain the terms : i) Efficiency ii) System performance iii) user service. **(06 Marks)**

Module-2

3 a. With the help of a neat sketch, explain the view of processor. **(08 Marks)**

b. Define process state. Write a neat sketch, explain the fundamental state transitions of processes. **(08 Marks)**

OR

4 a. For the given set processes, perform FCFS and SRN scheduling. Compare their performance in terms of mean turnaround time and mean weighted turnaround time. **(10 Marks)**

Processes	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. Write a neat sketch, explain long – medium and short term schedulers. **(06 Marks)**

Module-3

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

b. Define :
i) Internal and external fragmentation
ii) Paging and segmentation
iii) Logical address and physical address
iv) Page and page frame. **(08 Marks)**

OR

6 a. Write a neat sketch, explain the concepts involved in demand loading of a page. **(08 Marks)**

b. Explain FIFO and LRU page replacement policies. Show the operation of FIFO and LRU policies for the page reference string : 0, 1, 0, 2, 0, 1, 2 and time reference sting : t_1, t_2,t_3, t_4, t_5, t_6, t_7 and find out number of page faults. Given : number of page frames = 2. **(08 Marks)**

Module-4

7 a. Explain the file system and the IOCS with necessary sketches. **(08 Marks)**

b. Explain the fundamental file organizations. **(08 Marks)**

OR

8 a. What is a directory? Explain directory fields and its operation with a simple directory structure. **(08 Marks)**

b. Explain the file system actions when a file is opened. **(08 Marks)**

Module-5

9 a. Define message passing. Illustrate the implementation of message passing. **(08 Marks)**

b. Define mailbox. Explain message passing using a mailbox with necessary sketches. Also mention the advantages of using mail boxes. **(08 Marks)**

OR

10 a. Define Deadlock. Explain the deadlock handling approaches. **(08 Marks)**

b. With necessary sketches, explain the different deadlock prevention approaches. **(08 Marks)**

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CBCS Scheme

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15EC562

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. Define and hence give the syntax for declaring a variable. State the rules to be followed for declaring variables in C++. **(04 Marks)**

b. What is Dynamic memory management? Explain 'new' and 'delete' operator with an example. **(06 Marks)**

c. What are Enumerations in C++? Explain with an example. **(06 Marks)**

OR

2 a. What are data types in C++? List all the built in and derived data types with examples. **(06 Marks)**

b. With syntax and example give the control structures for switch and while statement. **(07 Marks)**

c. Give the examples for Relational, logical and Bitwise expressions available in C++. **(03 Marks)**

Module-2

3 a. What are inline functions? Why are they used? Explain with an example. List the situations where inline function cannot be used? **(08 Marks)**

b. Define a class and object. Write a C++ program to define a class called student with roll number, name and percentage as its data members and getdata ( ), printdata ( ) as member functions. **(08 Marks)**

OR

4 a. Write a program to create a class called employee consisting of name, designation, id and salary as class data variables. Using this class, print 5 employee information by reading the information of employee. Write the main program to create objects and call a member functions from class. **(08 Marks)**

b. What is a friend function? Give its characteristics. Write a program to find mean value of 2 numbers using friend function. **(08 Marks)**

Module-3

5 a. Define a constructor and destructors with examples. Illustrate the working of both with sample programs. **(08 Marks)**

b. Write a C++ program containing two data members height and base, use a constructor to set height and base with area ( ) and display ( ) as member function to calculate area of a triangle. **(08 Marks)**

OR

6 a. Mention the types of operators that cannot be overloaded. **(02 Marks)**

b. What is a copy constructor? Illustrate the working of copy constructor with a program. **(06 Marks)**

c. Discuss the principle of operator overloading. Write a C++ program to add two complex numbers by overloading operator. **(08 Marks)**

Module-4

7 a. How is polymorphism achieved in OOPS with virtual functions? Explain with an example. **(08 Marks)**

b. What are pure virtual functions? **(02 Marks)**

c. Explain the role of 'this' pointer with an example. **(06 Marks)**

OR

8 a. Give the syntax and example for defining derived class. Explain the access specifiers public, private and protected with examples. **(08 Marks)**

b. Explain the following with reference to OOPS

i) Single inheritance

ii) Multiple inheritances. **(08 Marks)**

Module-5

9 a. What are streams in C++? List and explain all the stream classes used for file operations. **(08 Marks)**

b. Explain the role with examples for unformatted I/O operation functions.

i) Put ( )

ii) get ( )

iii) getline ( )

iv) write ( ) **(08 Marks)**

OR

10 a. What are file input and output streams? Write a program for writing to and reading the data from a file using stream classes. **(08 Marks)**

b. With an example :

i) Explain the syntax for opening and closing of file operations.

ii) Explain End of file (EOF) operator **(08 Marks)**

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