

# CBCS SCHEME

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17MAT41

## Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Engineering Mathematics – IV

Time: 3 hrs.

Max. Marks: 100

Note:1) Answer any FIVE full questions, choosing ONE full question from each module.  
2) Use of Statistical tables allowed.

### Module-1

- 1 a. Use Taylor's series to obtain approximate value of  $y$  at  $x = 0.1$  for the differential equation  $\frac{dy}{dx} = 2y + 3e^x$ ,  $y(0) = 0$ . (06 Marks)
- b. Apply Runge Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.2$  for the equation  $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ ,  $y(0) = 1$  taking  $h = 0.2$ . (07 Marks)
- c. Using Milne's predictor – corrector method, find  $y$  when  $x = 0.8$  given  $\frac{dy}{dx} = x - y^2$ ,  $y(0) = 0$ ,  $y(0.2) = 0.02$ ,  $y(0.4) = 0.0795$ ,  $y(0.6) = 0.1762$ . (07 Marks)

OR

- 2 a. Given that  $\frac{dy}{dx} = \log(x + y)$  and  $y(1) = 2$ , then find  $y(1.2)$  in step of 0.2 using modified Euler's method carry out two iterations. (06 Marks)
- b. Using fourth order Runge-Kutta method to find  $y$  at  $x = 0.2$  equation given that  $\frac{dy}{dx} = x + y$ ,  $y(0) = 1$  and  $h = 0.2$ . (07 Marks)
- c. Given  $\frac{dy}{dx} = x^2(1 + y)$  and  $y(1) = 1$ ,  $y(1.1) = 1.233$ ,  $y(1.2) = 1.548$ ,  $y(1.3) = 1.979$ . Evaluate  $y(1.4)$  by Adam's-Bashforth predictor-corrector method. (07 Marks)

### Module-2

- 3 a. Using Runge-Kutta method, solve  $\frac{d^2y}{dx^2} = x \frac{dy}{dx} - y^2$  for  $x = 0.2$ , correct to three decimal places, with initial conditions  $y(0) = 1$ ,  $y'(0) = 0$ . (06 Marks)
- b. If  $\alpha$  and  $\beta$  are two distinct roots of  $J_n(x) = 0$ , then  $\int_0^1 x J_n(\alpha x) J_n(\beta x) dx = 0$  if  $\alpha \neq \beta$ . (07 Marks)
- c. Express  $f(x) = 3x^3 - x^2 + 5x - 2$  in terms of Legendre polynomials. (07 Marks)

OR

- 4 a. Apply Milne's predictor-corrector method to compute  $y(0.4)$  given the differential equation  $\frac{d^2y}{dx^2} = 1 + \frac{dy}{dx}$  and the following initial values:  
 $y(0) = 1, y(0.1) = 1.1103, y(0.2) = 1.2427, y(0.3) = 1.399$   
 $y'(0) = 1, y'(0.1) = 1.2103, y'(0.2) = 1.4427, y'(0.3) = 1.699$  (06 Marks)
- b. With usual notation, show that  
 $J_{\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}} \sin x$  (07 Marks)
- c. With usual notation, derive the Rodrigue's formula  $P_n(x) = \frac{1}{(2^n)n!} \frac{d^n}{dx^n} (x^2 - 1)^n$ . (07 Marks)

**Module-3**

- 5 a. Find the bilinear transformation which map the points  $z = 0, 1, \infty$  into the points  $w = -5, -1, 3$  respectively. (06 Marks)
- b. Derive Cauchy-Riemann equations in Cartesian form. (07 Marks)
- c. Evaluate  $\int_C \frac{z^2}{(z-1)^2(z+2)} dz$  where  $C: |z| = 2.5$  by residue theorem. (07 Marks)

OR

- 6 a. If  $f(z)$  is a regular function of  $z$ , prove that  $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) |f(z)|^2 = 4|f'(z)|^2$ . (06 Marks)
- b. Discuss the transformation  $W = Z^2$ . (07 Marks)
- c. Evaluate  $\int_C \frac{e^{2z}}{(z+1)(z+2)}$ , where  $C$  is the circle  $|z| = 3$ , using Cauchy residue theorem. (07 Marks)

**Module-4**

- 7 a. The probability density function of a variate  $x$  given by the following table:

X	-3	-2	-1	0	1	2	3
P(X)	K	2K	3K	4K	3K	2K	K

Find the value of  $K$ , mean and variance. (06 Marks)

- b. In a test on 2000 electric bulbs, it was found that the life of a particular make, was normally distributed with an average life of 2040 hours and S.D. of 60 hours. Estimate the number of bulbs likely to burn for, (i) more than 2150 hours, (ii) less than 1950 hours, (iii) more than 1920 hours and but less than 2160 hours.  
 Given :  $A(0 < z < 1.83) = 0.4664, A(0 < z < 1.33) = 0.4082$  and  $A(0 < z < 2) = 0.4772$  (07 Marks)
- c. A joint probability distribution is given by the following table:

	Y	-3	2	4
X				
1		0.1	0.2	0.2
3		0.3	0.1	0.1

Determine the marginal probability distributions of  $X$  and  $Y$ . Also find  $\text{COV}(X, Y)$ . (07 Marks)

OR

- 8 a. Derive mean and variance of the Poisson distribution. (06 Marks)
- b. In a certain town the duration of a shower is exponentially distributed within mean 5 minute. What is the probability that a shower will last for,
- (i) less than 10 minutes (ii) 10 minutes or more
- (iii) between 10 and 12 minutes. (07 Marks)
- c. Given,

Y \ X	0	1	2	3
0	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$
1	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	0

- (i) Find Marginal distribution of X and Y.
- (ii) Find  $E(X)$ ,  $E(Y)$  and  $E(XY)$ . (07 Marks)

**Module-5**

- 9 a. A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased at 5% level of significance. (06 Marks)
- b. Five dice were thrown 96 times and number 1, 2 or 3 appearing on the face of the dice follows the frequency distribution as follows:

No. of dice showing 1, 2 or 3 :	5	4	3	2	1	0
Frequency :	7	19	35	24	8	3

Test the hypothesis that the data follow a binomial distribution at 5% level of significance ( $\chi_{0.05}^2 = 11.07$  for d.f is 5). (07 Marks)

- c. A student's study habits are as follows:  
If he studies one night, he is 70% sure not to study the next night. On the other hand if he does not study one night he is 60% sure not to study the next night. In the long run how often does he study? (07 Marks)

OR

- 10 a. If  $p = \begin{pmatrix} 0 & \frac{2}{3} & \frac{1}{3} \\ \frac{1}{2} & 0 & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$ , find the fixed probabilities vector. (06 Marks)

- b. A random sample of 10 boys had the following I.Q's : 70, 120, 110, 101, 88, 83, 95, 98, 107, 100. Does this supports the hypothesis that the population mean of I.Q's is 100 at 5% level of significance? ( $t_{0.05} = 2.262$  for 9 d.f) (07 Marks)
- c. Explain : (i) Transient state (ii) Absorbing state (iii) Recurrent state. (07 Marks)

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17MATDIP41

## Fourth Semester B.E. Degree Examination, Aug./Sept. 2020 Additional Mathematics – II

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Find the rank of the matrix  $A = \begin{bmatrix} 1 & 2 & 3 & -1 \\ 2 & -1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix}$ . (07 Marks)
- b. Find the inverse of the matrix  $\begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix}$  using Cayley-Hamilton theorem. (07 Marks)
- c. Find the Eigen values of the matrix  $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ . (06 Marks)

### OR

- 2 a. Solve the system of equation by Gauss elimination method,  
 $2x + y + 4z = 12$   
 $4x + 11y - z = 33$   
 $8x - 3y + 2z = 20$  (07 Marks)
- b. Using Cayley-Hamilton theorem find  $A^{-1}$ , given  
 $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ . (07 Marks)
- c. Find the rank of the matrix by reducing in to row echelon form, given  
 $A = \begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$ . (06 Marks)

### Module-2

- 3 a. Solve by method of undetermined co-efficient  $y'' - 4y' + 4y = e^x$ . (07 Marks)
- b. Solve  $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 8y = 0$ . (07 Marks)
- c. Solve  $y'' + 2y' + y = 2x$ . (06 Marks)

### OR

- 4 a. Solve  $\frac{d^2y}{dx^2} + y = \sec x \tan x$  by method of variation of parameter. (07 Marks)
- b. Solve  $y'' - 4y' + 13y = \cos 2x$ . (07 Marks)
- c. Solve  $6\frac{d^2y}{dx^2} + 17\frac{dy}{dx} + 12y = e^{-x}$ . (06 Marks)

Module-3

- 5 a. Express the following function into unit step function and hence find  $L[f(t)]$  given

$$f(t) = \begin{cases} t, & 0 < t < 4 \\ 5, & t > 4 \end{cases} \quad (07 \text{ Marks})$$

b. Find  $L\left[\frac{1 - e^{-at}}{t}\right]$ . (07 Marks)

c. Find  $L[t \cdot \cos at]$ . (06 Marks)

OR

6 a. Find  $L[\sin 5t \cdot \cos 2t]$ . (07 Marks)

b. Find  $L[e^{-t} \cos^2 3t]$ . (07 Marks)

c. Find  $L[\cos 3t \cdot \cos 2t \cdot \cos t]$ . (06 Marks)

Module-4

- 7 a. Employ Laplace transform to solve the equation  $y'' + 5y' + 6y = 5e^{2x}$  given  $y(0) = 2$ ,  $y'(0) = 1$ . (07 Marks)

b. Find  $L^{-1}\left[\frac{1}{s(s+1)(s+2)(s+3)}\right]$ . (07 Marks)

c. Find  $L^{-1}\left[\frac{s+5}{s^2-6s+13}\right]$ . (06 Marks)

OR

- 8 a. Using Laplace transforms solve  $y'' + 4y' + 4y = e^{-t}$  given  $y(0) = 0$ ,  $y'(0) = 0$ . (07 Marks)

b. Find  $L^{-1}\left[\log\left(\frac{s+a}{s+b}\right)\right]$ . (07 Marks)

c. Find  $L^{-1}\left[\frac{2s-5}{4s^2+25}\right] + L^{-1}\left[\frac{8-6s}{16s^2+9}\right]$ . (06 Marks)

Module-5

- 9 a. State and prove Baye's theorem. (07 Marks)  
 b. A shooter can hit a target in 3 out of 4 shots and another shooter can hit the target in 2 out of 3 shots. Find the probability that the target is being hit.

(i) When both of them try.

(ii) By only one shooter. (07 Marks)

- c. If A and B are any two mutually exclusive events of S, then show that

$$P(A \cup B) = P(A) + P(B) - P(A \cap B). \quad (06 \text{ Marks})$$

OR

- 10 a. Three machines A, B and C produce respectively 60%, 30%, 10% of the total number of items of a factory. The percentages of defective out put of these machines are respectively 2%, 3% and 4%. An item is selected at random and is found defective. Find the probability that the item non produced by machine C. (07 Marks)

b. Prove the following : (i)  $P(\phi) = 0$  (ii)  $P(\bar{A}) = 1 - P(A)$  (07 Marks)

- c. If A and B are events with  $P(A \cup B) = \frac{7}{8}$ ,  $P(A \cap B) = \frac{1}{4}$  and  $P(\bar{A}) = \frac{5}{8}$  find  $P(A)$ ,  $P(B)$  and

$$P(A \cap \bar{B}). \quad (06 \text{ Marks})$$

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17CS42

## Fourth Semester B.E. Degree Examination, Aug./Sept. 2020 Object Oriented Concepts

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. State the important features of object oriented programming paradigm. (10 Marks)  
b. Define function overloading and write a C++ program for finding volume of a cube ( $s*s*s$ ), volume of cylinder ( $PI*r*r*h$ ), rectangular box ( $l*b*h$ ) by accepting input from keyboard and printing the volume on console using the method volume ( ) applying the concept of function overloading. (10 Marks)

OR

- 2 a. Explain function prototyping with example. (06 Marks)  
b. How do namespace helps in preventing pollution of the global namespace? (06 Marks)  
c. What is constructor? List the different types of constructors and explain default constructor. (08 Marks)

### Module-2

- 3 a. List and explain JAVA Buzzwords. (10 Marks)  
b. Explain the structure of JAVA program and its keywords with an example. (10 Marks)

OR

- 4 a. Discuss the label break and continue statement, with an example each. (06 Marks)  
b. Explain concepts of arrays in JAVA with example. Also write a program that creates and initialize a five floating element array. Find the sum and average of its value. (08 Marks)  
c. Write a JAVA program to calculate Sum and average of first six elements of an array {10, 20, 32, 42, 55, 60, 75, 82, 90, 92} using for each loop. How for each is different from for loop. (06 Marks)

### Module-3

- 5 a. Explain the different access specifiers in JAVA, with example. (08 Marks)  
b. Which is the alternative approach to implement multiple inheritance in JAVA? Explain with an example. (06 Marks)  
c. With example, give two uses of super. (06 Marks)

OR

- 6 a. What is an exception? With syntax and example, explain exception handling mechanism. (08 Marks)  
b. When constructors are called in the class hierarchy? (06 Marks)  
c. Explain package and its types. Explain import command in Java with examples. (06 Marks)

### Module-4

- 7 a. What is the need of synchronization? Explain with an example, how synchronization is implemented in Java. (08 Marks)  
b. What is meant by thread priority? How is it assigned? (08 Marks)  
c. Briefly explain adapter class. (04 Marks)

OR

- 8 a. Explain the mechanism of event delegation model. Give an example for using keyboard event. (10 Marks)
- b. Define the concept of multithreading in Java and explain different phases in life cycle of a thread. (05 Marks)
- c. Explain keyEvents and MouseEvent class. (05 Marks)

**Module-5**

- 9 a. What is an applet? What are its types? Explain the skeleton of an applet. Enlist Applet tags. (10 Marks)
- b. Give the different forms of repaint method. (06 Marks)
- c. Explain getDocument ( ) and getCodebase ( ). (04 Marks)

OR

- 10 a. Write the advantages of swings over AWT. (04 Marks)
- b. Explain two key features of swings. (06 Marks)
- c. Write a swing program for displaying anyone of the options ; apple, orange, mango, grapes, through the selection of combobox by clicking show button. (10 Marks)

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17CS43

## Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- Define an algorithm. Explain the characteristics of an algorithm. (04 Marks)
  - What are Asymptotic notations? List and describe the various asymptotic notations with an example of each. (08 Marks)
  - Explain the general plan of mathematical analysis of non-recursive algorithm with an example. (08 Marks)

OR

- What is the worst case, best case and average case efficiencies of sequential search? (04 Marks)
  - Illustrate mathematical analysis of recursive algorithm for Towers of Hanoi problem. (08 Marks)
  - Discuss the important problem types and fundamental data structures. (08 Marks)

### Module-2

- Discuss how Quick sort algorithm works to sort an array and trace for the following data set. Draw the tree of recursive calls made.

25	91	46	35	11	82	14	55
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Derive best case complexity of quick sort algorithm.

(10 Marks)

- Obtain the topological sorting for the digraph shown in Fig.Q3(b), using source removal method.

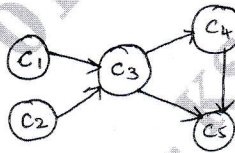


Fig.Q3(b)

(06 Marks)

- List out the advantages and disadvantages of divide and conquer technique. (04 Marks)

OR

- Explain divide and conquer technique with its control abstraction. (04 Marks)
  - Develop an algorithm for sorting elements using Simple merge. Apply the same for sorting list of elements given below:

67	90	12	56	23	34	45
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(08 Marks)

- Apply Strassen's algorithm to compute

$$\begin{bmatrix} 1 & 0 & 2 & 1 \\ 4 & 1 & 1 & 0 \\ 0 & 1 & 3 & 0 \\ 5 & 0 & 2 & 1 \end{bmatrix} * \begin{bmatrix} 0 & 1 & 0 & 1 \\ 2 & 1 & 0 & 4 \\ 2 & 0 & 1 & 1 \\ 1 & 3 & 5 & 0 \end{bmatrix}$$

(08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.



**Module-3**

- 5 a. State Job sequencing with deadline problem. Find the solution generated by job sequencing problem for 7 jobs given profits 3, 5, 20, 18, 1, 6, 30 and deadlines 1, 3, 4, 3, 2, 1, 2 respectively. (04 Marks)
- b. Explain the concept of greedy technique for Prim's algorithm. Obtain a minimum cost spanning tree for the graph below in Fig.Q5(b).

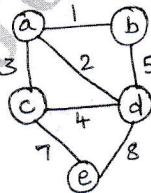


Fig.Q5(b)

(08 Marks)

- c. Sort the given list of number using Heap sort:

2	7	1	6	5	4	3
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(08 Marks)

**OR**

- 6 a. Explain Greedy criterion. Apply greedy method for the following instance of knapsack problem. Capacity of the knapsack (M) = 5.

Item	Weight	Value
1	2	\$12
2	1	\$10
3	3	\$20
4	2	\$15

(08 Marks)

- b. Construct a Huffman code for the following data and encode the test BADEC.

Character	A	B	C	D	E
Probability	0.4	0.1	0.2	0.15	0.15

(06 Marks)

- c. Solve the below instance (Fig.Q6(c)) of single source shortest path problem with vertex a as the source.

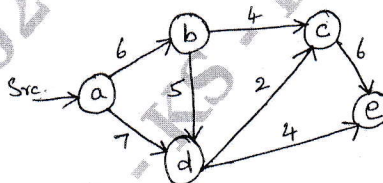


Fig.Q6(c)

(06 Marks)

**Module-4**

- 7 a. What is Dynamic programming? Using Warshall's algorithm, obtain the transitive closure of the graph defined by the following adjacency matrix.

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

(04 Marks)

- b. Define multistage graph problem. Determine the minimum cost path from source (S) to sink (T) for the graph in Fig.Q7(b) using forward approach.

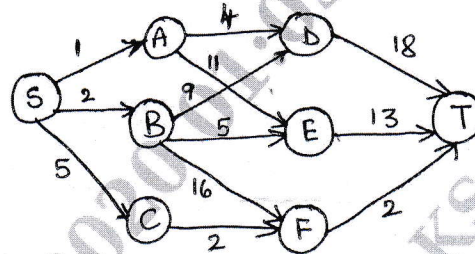


Fig.Q7(b)

(06 Marks)

- c. Solve the below instance of Bellman-Ford algorithm [Fig.Q7(c)].

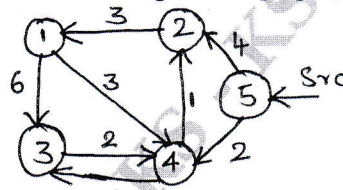


Fig.Q7(c)

(10 Marks)

OR

- 8 a. Explain Travelling Salesperson Problem (TSP). Solve the below instance of TSP using dynamic programming.

	1	2	3	4
1	0	10	15	20
2	5	0	9	10
3	6	13	0	12
4	8	8	9	0

(08 Marks)

- b. Obtain optimal Binary search Tree for the following identifiers.

	1	2	3	4
a[i]	do	if	int	while
p[i]	0.1	0.2	0.4	0.3

(12 Marks)

**Module-5**

- 9 a. Draw the state-space tree top generate solutions to 4-Queen's problem. (04 Marks)  
 b. Apply backtracking technique to solve the below instance of the subset sum problem. (08 Marks)  
 $s = \{ 1, 3, 4, 6 \}$   $d = 7$

- c. Apply Branch and Bound technique to the following insurance of assignment problem.

	job1	job2	job3	job4	
C =	9	2	7	8	Person a
	6	4	3	7	Person b
	5	8	1	8	Person c
	7	6	9	4	Person d

(08 Marks)

OR

- 10 a. How the Branch\_and\_Bound technique is different from backhacking? Solve the following insurance of knapsack problem using Branch\_and\_Bound technique. Give knapsack capacity = 10.

Item	1	2	3	4
Weight	4	7	5	3
Value	40	42	25	12

(08 Marks)

- b. Define Hamiltonian cycle. Check whether the Hamiltonian cycle exists for the graph given below in Fig.Q10(b).

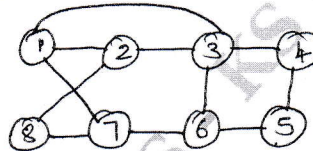


Fig.Q10(b)

(04 Marks)

- c. Define the following :

(i) Class P      (ii) Class NP      (iii) NP Complete Problem      (iv) NP Hard Problem.

(08 Marks)

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17CS44

## Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Microprocessor and Microcontroller

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain with a neat block diagram basic structure of 8086 microprocessor. (10 Marks)
- b. Compare 8086, 80486 and Pentium microprocessor. (05 Marks)
- c. List out the flags of 8086 microprocessor. (05 Marks)

**OR**

- 2 a. Explain with suitable examples various addressing modes of 8086 microprocessor. (07 Marks)
- b. What is assembler directive? Explain the following assembler directives.  
(i) Program organization directives  
(ii) Data definition directives  
(iii) Program end directives. (07 Marks)
- c. Explain the control transfer instructions of 8086 microprocessor or processor control instructions. (06 Marks)

### Module-2

- 3 a. Explain the following with an example for each:  
(i) DAA (ii) IDIV (iii) ADD (iv) PUSH (08 Marks)
- b. Write a program to convert 34 and 37 ASCII numbers into packed BCD numbers. (06 Marks)
- c. Explain the following rotate instructions with suitable examples.  
(i) ROL (ii) ROR (iii) RLC (iv) RRC (06 Marks)

**OR**

- 4 a. Explain the following, with a code of BIOS INT10H programming mode of interrupts.  
(i) Clearing the screen  
(ii) Sets the cursor at the center of the screen (06 Marks)
- b. Explain the following DOS interrupts 21H with an example for each.  
(i) Int 21H option 09  
(ii) Int 21H option 02 (06 Marks)
- c. Define macro and write the syntax of macro definition for the following functions:  
(i) Setting the cursor position  
(ii) Display string  
(iii) Clearing the screen (08 Marks)

### Module-3

- 5 a. What is FlashROM? Explain the functional block diagram of 6116 SRAM. (06 Marks)
- b. List out at least five differences between SRAM and DRAM. (05 Marks)
- c. Explain how to access the even and odd words in 8086 microprocessor with a suitable diagram. (04 Marks)
- d. Explain 74LS138 decoder with a neat diagram. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8=50, will be treated as malpractice.

OR

- 6 a. Assume that we have 4 bytes of hexadecimal data 25H, 62H, 3FH and 52H.  
 (i) Find the checksum byte  
 (ii) Perform the checksum operation to ensure data integrity  
 (iii) If the second byte 62 has been changed to 22 show the checksum detects the error. (06 Marks)
- b. Explain each pin of 8255 programmable peripheral interface device with its neat pin diagram. (10 Marks)
- c. Explain the basic I/O modes of 8255 device. (04 Marks)

**Module-4**

- 7 a. What is RISC machine? Explain RISC design philosophy. (06 Marks)  
 b. Explain the instruction set for embedded system. (05 Marks)  
 c. Explain with neat sketch AMBA bus protocol. (05 Marks)  
 d. Explain embedded system software. (04 Marks)

OR

- 8 a. Explain ARM core data flow model functional units with suitable diagram. (07 Marks)  
 b. Explain current program status register with a bitwise manipulated operation with a neat sketch. (05 Marks)  
 c. Explain complete ARM register set. (08 Marks)

**Module-5**

- 9 a. Explain the concept of Barrel shifter with ALU of ARM processor along with logical left shift operation. (08 Marks)  
 b. Explain the following logical instructions of ARM processor with an example.  
 (i) ORR (ii) BIC (iii) CMP (06 Marks)  
 c. Explain single register transfer instruction of ARM processor. (06 Marks)

OR

- 10 a. List out the addressing methods for stack operations of ARM processor. Explain STMFD instruction of ARM processor. (07 Marks)  
 b. List out and explain SWAP instruction of ARM processor with examples. (06 Marks)  
 c. Explain software interrupt instructions of ARM processor with examples. Explain how SWI handler can be implemented. (07 Marks)

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# CBCS SCHEME

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17CS45

## Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Software Engineering

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. What is a Software? List and explain Software Engineering Ethics. (07 Marks)  
b. Explain Boehm's Spiral model with a neat diagram. (07 Marks)  
c. Explain Ethnography in detail. (06 Marks)

OR

- 2 a. Explain software design process with a neat diagram. (06 Marks)  
b. Explain various stages of software testing process. (06 Marks)  
c. Explain interviewing and scenarios. (08 Marks)

### Module-2

- 3 a. What is behavioural model? Explain data driven model with a neat diagram. (07 Marks)  
b. What is a state diagram? Explain the working of microwave oven with a neat diagram. (06 Marks)  
c. Explain model driven architecture with a neat diagram. (07 Marks)

OR

- 4 a. What is RUP? Explain the phases in rational unified process. (08 Marks)  
b. What is a pattern? Explain observer pattern. (06 Marks)  
c. Explain three implementation issues. (06 Marks)

### Module-3

- 5 a. State and explain development testing and its three levels unit testing, component testing and system testing. (07 Marks)  
b. What is test driven development? State the benefits of test driven development. (07 Marks)  
c. Explain scenario and performance testing. (06 Marks)

OR

- 6 a. With a neat diagram, explain the software evolution process. (06 Marks)  
b. Explain the Lehman's law concern to the system changes. (08 Marks)  
c. What is software maintenance? State the activities of reengineering process. (06 Marks)

### Module-4

- 7 a. Explain the factors affecting software pricing. (05 Marks)  
b. Explain project planning process with a neat diagram. (05 Marks)  
c. List and explain various COCOMO cost estimation model. (10 Marks)

OR

- 8 a. Explain software review process with a neat diagram. (07 Marks)  
b. What is Program Inspection? Explain inspection check list. (07 Marks)  
c. What are product metrics? Discuss two classes of product metrics. Explain static software product metrics. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg.  $42+8=50$ , will be treated as malpractice.

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**Module-5**

- 9 a. Explain the ways of coping with changes and reduction of rework cost. (06 Marks)  
b. Explain the process of prototype development. What are its benefits? (08 Marks)  
c. List and explain the various extreme programming practices. (06 Marks)

**OR**

- 10 a. What is pair programming? List the advantages of pair programming. (05 Marks)  
b. Distinguish between plan driven and agile development with a neat diagram. (08 Marks)  
c. Explain SCRUM process with its characteristics. (07 Marks)

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# CBCS SCHEME

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17CS46

Fourth Semester B.E. Degree Examination, Aug./Sept.2020

## Data Communication

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Define Data Communication. With a neat diagram, explain Network topologies. (05 Marks)
- b. Explain TCP/IP protocol suite with multiplexing and demultiplexing concepts. (10 Marks)
- c. Illustrate line coding techniques. Draw a line coding sequence for 010010 using Polar and Bipolar schemes. (05 Marks)

OR

- 2 a. How do you measure the performance of the network? Explain. (06 Marks)
- b. Explain the Transmission impairments of media. (09 Marks)
- c. List and explain the Internet Administration. (05 Marks)

### Module-2

- 3 a. Write about Pulse Code Modulation (PCM) and discuss the steps involved in the quantization process. (07 Marks)
- b. Compare and explain Parallel and Serial data transmission modes. (07 Marks)
- c. Explain Amplitude Shift Keying (ASK). (06 Marks)

OR

- 4 a. What is Multiplexing? Explain the wavelength division multiplexing. (07 Marks)
- b. Calculate bit rate, if the available bandwidth is 100Khz and which spans from 200 Khz to 300 Khz. Consider ASK with  $d = 1$  and  $r = 1$ . (04 Marks)
- c. What is Spread Spectrum? Explain DHSS bandwidth sharing. (09 Marks)

### Module-3

- 5 a. How does data words and code words are represented in block coding and explain how can errors be detected and corrected using block coding? (10 Marks)
- b. Find the code word using CRC encoder and demonstrate whether the data word is accepted or discarded. The given data is 1001 and the generator is 1011. (10 Marks)

OR

- 6 a. Explain in detail character oriented framing and bit oriented framing with appropriate example. (10 Marks)
- b. Explain the PPP frame format. (10 Marks)

### Module-4

- 7 a. Explain pure ALOHA and Slotted ALOHA with reference to i) Frame time and ii) Vulnerable time and iii) Throughputs. (10 Marks)
- b. List and explain any one channelization protocol in detail. (10 Marks)

OR



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- 8 a. Explain Gigabit Ethernet design techniques. (10 Marks)  
b. Illustrate Blue tooth architecture and its types, with a neat figure. (10 Marks)

**Module-5**

- 9 a. List and explain in detail the types of services provided by the WiMAX. (10 Marks)  
b. Explain satellite networks and its operations. (10 Marks)

**OR**

- 10 a. Explain the three phases of mobile host to communication with remote host with a suitable diagram. (10 Marks)  
b. Illustrate the transition strategies from IPV4 to IPV6. (10 Marks)

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