CBCS Scheme

15MATDIP41

Fourth Semester B.E. Degree Examination, June/July 2017
Additional Mathematics – II

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a.   Find the rank of the matrix :

$$\begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$$ by elementary row transformations.   **(06 Marks)**

   b.   Solve the following system of equations by Gauss elimination method :
        $2x + y + 4z = 12$
        $4x + 11y - z = 33$
        $8x - 3y + 2z = 20.$ **(05 Marks)**

   c.   Find all the eigen values and eigen vector corresponding to largest eigen value of the matrix :

$$\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}.$$ **(05 Marks)**

OR

2   a.   Solve the following system of equations by Gauss elimination method :
        $x + y + z = 9$
        $2x + y - z = 0$
        $2x + 5y + 7z = 52.$ **(06 Marks)**

   b.   Reduce the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ into its echelon form and hence find its rank.   **(05 Marks)**

   c.   Find the inverse of the matrix $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ using Cayley – Hamilton theorem.   **(05 Marks)**

Module-2

3   a.   Solve $(D^2 - 4D + 13)y = \cos 2x$ by the method of undetermined coefficients.   **(06 Marks)**
   b.   Solve $(D^2 + 2D + 1)y = x^2 + 2x.$ **(05 Marks)**
   c.   Solve $(D^2 - 6D + 25)y = \sin x.$ **(05 Marks)**

OR

4   a.   Solve $(D^2 + 1)y = \tan x$ by the method of variation of parameters.   **(06 Marks)**
   b.   Solve $(D^3 + 8)y = x^4 + 2x + 1.$ **(05 Marks)**
   c.   Solve $(D^2 + 2D + 5)y = e^{-x} \cos 2x.$ **(05 Marks)**

Module-3

5 a. Find the Laplace transforms of :

   i) $e^{-t}\cos^2 3t$ ii) $\dfrac{\cos 2t - \cos 3t}{t}$. **(06 Marks)**

   b. Find:

   i) $L\left[t^{-5/2} + t^{5/2}\right]$ ii) $L\left[\sin 5t \cdot \cos 2t\right]$. **(05 Marks)**

   c. Find the Laplace transform of the function : $f(t) = E \sin\left(\dfrac{\pi t}{\omega}\right)$, $0 < t < \omega$, given that $f(t + \omega) = f(t)$. **(05 Marks)**

OR

6 a. Find :

   i) $L\left[t^2 \sin t\right]$ ii) $L\left[\dfrac{\sin 2t}{t}\right]$. **(06 Marks)**

   b. Evaluate : $\displaystyle\int_0^\infty \dfrac{\cos 6t - \cos 4t}{t}\,dt$ using Laplace transform. **(05 Marks)**

   c. Express $f(t) = \begin{cases} \sin 2t, & 0 < t < \pi \\ 0, & t > \pi \end{cases}$, in terms of unit step function and hence find $L[f(t)]$. **(05 Marks)**

Module-4

7 a. Solve the initial value problem $\dfrac{d^2 y}{dx^2} + \dfrac{5dy}{dx} + 6y = 5e^{2x}$, $y(0) = 2$, $y'(0) = 1$ using Laplace transforms. **(06 Marks)**

   b. Find the inverse Laplace transforms : i) $\dfrac{3(s^2 - 1)^2}{2s^2}$ ii) $\dfrac{s+1}{s^2 + 6s + 9}$. **(05 Marks)**

   c. Find the inverse Laplace transform : $\log\left[\dfrac{s^2 + 4}{s(s+4)(s-4)}\right]$. **(05 Marks)**

OR

8 a. Solve the initial value problem :

   $\dfrac{d^2 y}{dt^2} + \dfrac{4dy}{dt} + 3y = e^{-t}$ with $y(0) = 1 = y'(0)$ using Laplace transforms. **(06 Marks)**

   b. Find the inverse Laplace transform : i) $\dfrac{1}{s\sqrt{5}} + \dfrac{3}{s^2\sqrt{5}} - \dfrac{8}{\sqrt{5}}$ ii) $\dfrac{3s+1}{(s-1)(s^2 + 1)}$. **(05 Marks)**

   c. Find the inverse Laplace transform : $\dfrac{2s - 1}{s^2 + 4s + 29}$. **(05 Marks)**

Module-5

9 a. State and prove Baye's theorém. **(06 Marks)**

   b. A can hit a target 3 times in 5 shots, B 2 times in 5 shots and C 3 times in 4 shots. They fire a volley. What is the probability that i) two shots hit ii) atleast two shots hit? **(05 Marks)**

   c. Find $P(A)$, $P(B)$ and $P(A \cap \overline{B})$, if A and B are events with $P(A \cup B) = \dfrac{7}{8}$, $P(A \cap B) = \dfrac{1}{4}$ and $P(\overline{A}) = \dfrac{5}{8}$. **(05 Marks)**

OR

10 a. Prove that $P(A \cup B) = P(A) + (B) - P(A \cap B)$, for any two events A and B. **(06 Marks)**

   b. Show that the events $\overline{A}$ and $\overline{B}$ are independent, if A and B are independent events. **(05 Marks)**

   c. Three machines A, B and C produce respectively 60%, 30%, 10% of the total number of items of a factory. The percentage of defective output 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 was produced by machine C. **(05 Marks)**

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CBCS Scheme

Fourth Semester B.E. Degree Examination, June/July 2017
Engineering Mathematics–IV

Time: 3 hrs.   Max. Marks: 80

Note: 1. *Answer FIVE full questions, choosing one full question from each module.*
        2. *Use of statistical tables are permitted.*

Module-1

1 a. Find by Taylor's series method the value of y at x = 0.1 from $\dfrac{dy}{dx} = x^2 y - 1$, $y(0) = 1$ (upto 4th degree term). **(05 Marks)**

    b. The following table gives the solution of $5xy' + y^2 - 2 = 0$. Find the value of y at x = 4.5 using Milne's predictor and corrector formulae. **(05 Marks)**

x	4	4.1	4.2	4.3	4.4
y	1	1.0049	1.0097	1.0143	1.0187

    c. Using Euler's modified method. Obtain a solution of the equation $\dfrac{dy}{dx} = x + \left|\sqrt{y}\right|$, with initial conditions y = 1 at x = 0, for the range $0 \le x \le 0.4$ in steps of 0.2. **(06 Marks)**

OR

2 a. Using modified Euler's method find y(20.2) and y(20.4) given that $\dfrac{dy}{dx} = \log_{10}\left(\dfrac{x}{y}\right)$ with y(20) = 5 taking h = 0.2. **(05 Marks)**

    b. Given $\dfrac{dy}{dx} = x^2(1 + y)$ and y(1) = 1, y(1.1) = 1.233, y(1.2) =1.548, y(1.3) = 1.979. Evaluate y(1.4) by Adams-Bashforth method. **(05 Marks)**

    c. Using Runge-Kutta method of fourth order, solve $\dfrac{dy}{dx} = \dfrac{y^2 - x^2}{y^2 + x^2}$ with y(0) = 1 at x = 0.2 by taking h = 0.2 **(06 Marks)**

Module-2

3 a. Obtain the solution of the equation $2\dfrac{d^2 y}{dx^2} = ux + \dfrac{dy}{dx}$ by computing the value of the dependent variable corresponding to the value 1.4 of the independent variable by applying Milne's method using the following data: **(05 Marks)**

x	1	1.1	1.2	1.3
y	2	2.2156	2.4649	2.7514
y'	2	2.3178	2.6725	3.0657

    b. Express $f(x) = 3x^3 - x^2 + 5x - 2$ in terms of Legendre polynomials. **(05 Marks)**

    c. Obtain the series solution of Bessel's differential equation $x^2 y'' + xy' + (x^2 + n^2)y = 0$ **(06 Marks)**

OR

4 a. By Runge-Kutta method solve $\dfrac{d^2y}{dx^2} = x\left(\dfrac{dy}{dx}\right)^2 - y^2$ for x = 0.2. Correct to four decimal places using the initial conditions y = 1 and $y' = 0$ at x = 0, h = 0.2. **(05 Marks)**

b. Prove that $J_{+\frac{1}{2}}(x) = \sqrt{\dfrac{2}{\pi x}} \sin x$ **(05 Marks)**

c. Prove the Rodrigues formula,
$$\rho_n(x) = \frac{1}{2^n n!} \frac{d^n(x^2-1)^n}{dx^n}$$ **(06 Marks)**

Module-3

5 a. State and prove Cauchy's-Riemann equation in polar form. **(05 Marks)**

b. Discuss the transformation $W = e^z$. **(05 Marks)**

c. Evaluate $\displaystyle\int_C \left\{ \frac{\sin(\pi z^2) + \cos(\pi z^2)}{(z-1)^2(z-2)} \right\} dz$

using Cauchy's residue theorem where 'C' is the circle $|z| = 3$ **(06 Marks)**

OR

6 a. Find the analytic function whose real part is, $\dfrac{\sin 2x}{\cosh 2y - \cos 2x}$. **(05 Marks)**

b. State and prove Cauchy's integral formula. **(05 Marks)**

c. Find the bilinear transformation which maps z = ∞, i, 0 into ω = -1, -i, 1. Also find the fixed points of the transformation. **(06 Marks)**

Module-4

7 a. Find the mean and standard deviation of Poisson distribution. **(05 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 less than 2160 hours.
[A(1.833) = 0.4664, A(1.5) = 0.4332, A(2) = 0.4772] **(05 Marks)**

c. The joint probability distribution of two random variables x and y is as follows:

x/y	-4	2	7
1	1/8	1/4	1/8
5	1/4	1/8	1/8

Determine:
(i)   Marginal distribution of x and y.
(ii) Covariance of x and y.
(iii) Correlaiton of x and y. **(06 Marks)**

OR

8 a. The probability that a pen manufactured by a factory be defective is $\frac{1}{10}$. If 12 such pens are manufactured what is the probability that, (i) Exactly 2 are defective (ii) at least 2 are defective (iii) none of them are defective. **(05 Marks)**

b. Derive the expressions for mean and variance of binomial distribution. **(05 Marks)**

c. A random variable X take the values -3, -2, -1, 0, 1, 2, 3 such that $P(x = 0) = P(x < 0)$ and $P(x = -3) = P(x = -2) = P(x = -1) = P(x = 1) = P(x = 2) = P(x = 3)$. Find the probability distribution. **(06 Marks)**

Module-5

9 a. In 324 throws of a six faced 'die' an odd number turned up 181 times. Is it reasonable to think that the 'die' is an unbiased one? **(05 Marks)**

b. Two horses A and B were tested according to the time (in seconds) to run a particular race with the following results:

Horse A:	28	30	32	33	33	29	34
Horse B:	29	30	30	24	27	29	

Test whether you can discriminate between the two horses.($t_{0.05}$=2.2 and $t_{0.02}$=2.72 for 11 d.f) **(05 Marks)**

c. Find the unique fixed probability vector for the regular stochastic matrix, $A = \begin{bmatrix} 0 & 1 & 0 \\ \frac{1}{6} & \frac{1}{2} & \frac{1}{3} \\ 0 & \frac{2}{3} & \frac{1}{3} \end{bmatrix}$ **(06 Marks)**

OR

10 a. Define the terms: (i) Null hypothesis (ii) Type–I and Type–II error (iii) Confidence limits. **(05 Marks)**

b. Prove that the Markov chain whose t.p.m $P = \begin{bmatrix} 0 & \frac{2}{3} & \frac{1}{3} \\ \frac{1}{2} & 0 & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$ is irreducible. Find the corresponding stationary probability vector. **(05 Marks)**

c. Three boys A, B, C are throwing ball to each other. A always throws the ball to B and B always throws the ball to C. C is just as likely to throw the ball to B as to A. If C was the first person to throw the ball find the probabilities that after three throws (i) A has the ball. (ii) B has the ball. (iii) C has the ball. **(06 Marks)**

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CBCS Scheme

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Fourth Semester B.E. Degree Examination, June/July 2017
Software Engineering

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a.   What are the fundamental activities of software engineering?   **(04 Marks)**
    b.   With neat diagram, explain the water-fall model of software development process. **(06 Marks)**
    c.   With a diagram, explain the rational unified process.   **(06 Marks)**

OR

2   a.   What is requirement specification? Explain various ways of writing system requirements.
                                                    (06 Marks)
    b.   Why the understanding of requirements from stake holders is difficult task? Explain.
                                                    (05 Marks)
    c   Explain the different checks to be carried out during requirement validation process.
                                                    (05 Marks)

Module-2

3   a.   Draw a context model for patient information system. How the interactions are modeled?
                                                    (06 Marks)
    b.   Explain the terms class diagram, generalization and aggregation.   **(06 Marks)**
    c.   What is model Driven engineering? State the three types of abstract system models produced.   **(04 Marks)**

OR

4   a.   What are the things to be done for a design of object oriented system? How the objects are identified?   **(05 Marks)**
    b.   What is design pattern? Explain four elements of design pattern.   **(06 Marks)**
    c.   What is software reuse? State the general models of open source licenses.   **(05 Marks)**

Module-3

5   a.   State the two goals and three levels of granularity of software testing process.   **(05 Marks)**
    b.   What is test driven development? State the benefits of test driven developments.   **(05 Marks)**
    c.   Explain the six stages of acceptance testing process.   **(06 Marks)**

OR

6   a.   With neat diagram, show the software evolution process and explain the 'Lehman's Law' concern to system change.   **(10 Marks)**
    b.   What is software maintenance? State the activities of re-engineering process.   **(06 Marks)**

Module-4

7   a.   Explain the factors to be considered for approval of change.   (05 Marks)
    b.   Explain the features provided by version management systems.   (05 Marks)
    c.   What is configuration management? State the four activities of configuration management.
                                                                                         (06 Marks)

OR

8   a.   What is system building? State the features available in the system building tools. (10 Marks)
    b.   Explain the factors to be considered for release planning of system.   (06 Marks)

Module-5

9   a.   Explain the ways of coping with change and reduction of rework cost.   (06 Marks)
    b.   Explain the practices involved in the extreme programming.   (10 Marks)

OR

10 a.   State the principles of agile methods.   (05 Marks)
    b.   How the agile methods are scaled? State the coping of agile methods for large system engineering.   (05 Marks)
    c.   Write a note on pair programming.   (06 Marks)

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15CS43

Fourth Semester B.E. Degree Examination, June/July 2017
Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. Define algorithm. Explain asymptotic notations, Big O, big Omega, big theta notations.
   (08 Marks)
   b. Explain general plan of mathematical analysis of nonrecursive algorithms with example.
   (08 Marks)

OR

2 a. Define time and space complexity. Explain important problem types. **(08 Marks)**
   b. Illustrate mathematical analysis of recursive algorithm for towers of hanoii. **(08 Marks)**

Module-2

3 a. Explain concept of divide and conquer. Write merge sort algorithm. **(08 Marks)**
   b. Write a recursive algorithm for binary search and also bring out its efficiency. **(08 Marks)**

OR

4 a. Illustrate the tracing of quick sort algorithm for the following set of numbers:
   25, 10, 72, 18, 40, 11, 64, 58, 32, 9 **(08 Marks)**
   b. List out the advantages and disadvantages of divide and conquer method and illustrate the topological sorting for the following graph.
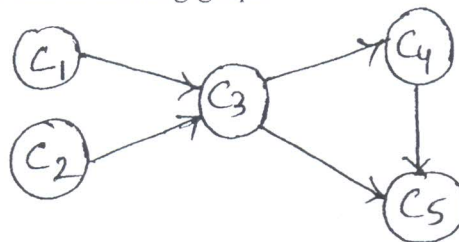

Fig.Q4(b) **(08 Marks)**

Module-3

5 a. Explain Greedy criterion. Write a Prim's algorithm to find minimum cost spanning tree.
   (08 Marks)
   b. Sort the given list of numbers using heap sort: 2, 9, 7, 6, 5, 8. **(08 Marks)**

OR

6 a. Write an algorithm to find single source shortest path. **(08 Marks)**
   b. Construct a Huffman tree and resulting code word for the following:

Character	A	B	C	D	-
Probability	0.35	0.1	0.2	0.2	0.15

   Encode the words DAD and ADD. **(08 Marks)**

Module-4

7 a. Explain the concept of dynamic programming, with example. (08 Marks)
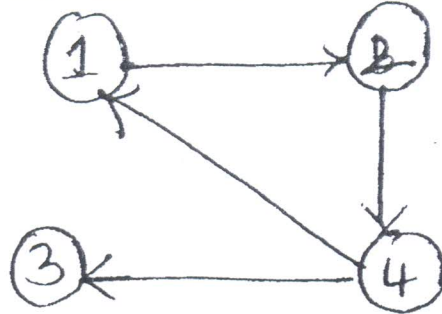   b. Trace the following graph using Warshall's algorithm.

Fig.Q7(b) (08 Marks)

OR

8 a. Explain Multistage graphs with example. Write multistage graph algorithm to forward approach. (08 Marks)
   b. Solve the following instance of Knapsack problem using dynamic programming. Knapsack capacity is 5.

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

(08 Marks)

Module-5

9 a. Explain backtracking concept. Illustrate N queens problem using backtracking to solve 4-Queens problem. (08 Marks)
   b. Solve subset sum problem for the following example, s = {3, 5, 6, 7} and d = 15. Construct a state space tree. (08 Marks)

OR

10 a. Explain the concept of branch and bound and solve assignment problem for the following and obtain optimal solution.

$$\text{Person} \begin{array}{c} a \\ b \\ c \\ d \end{array} \begin{bmatrix} \text{Job1} & \text{Job2} & \text{Job3} & \text{Job4} \\ 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{bmatrix}$$

(08 Marks)
   b. Explain LC Branch and Bound and FIFO branch and bound. (08 Marks)

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USN | | | | | | | | | | 15CS44

Fourth Semester B.E. Degree Examination, June/July 2017
Microprocessors and Microcontrollers

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a. Explain execution unit (EU) and Bus interface unit (BIU) of 8086 µp with a neat diagram.
        (08 Marks)
    b. Explain the different addressing modes used in 8086 µp with suitable example. **(08 Marks)**

OR

2   a. Explain all bits of flag register of 8086µp with a neat diagram. Show the setting and resetting of flag bits with a suitable example. **(06 Marks)**
    b. Write an assembly level program (ALP) to add two bytes of data stored at data 1 and data 2 and save the result in sum with comments. Indentify all the directives found in the program.
        (06 Marks)
    c. Show the memory dump for the following data section or data segment. **(04 Marks)**

        · DATA
        ORG   0010H
        DATA 1   DB   25
        DATA 2   DB   10001001B
        DATA 3   DB   12H
        ORG   0020H
        DATA 4   DB   '2591'
        ORG   0030H
        DATA 5   DW   9, 2, 7, 0CH, 00100000B, 5
        ORG   0040H
        DATA 6   DW   4 DUP (00H)

Module-2

3   a. Explain Rotate instructions with suitable example. **(06 Marks)**
    b. With a suitable program show how a packed BCD value is converted to ASCII value.
        (04 Marks)
    c. Assume that there is a class of five people. With following grades: 69, 87, 96, 45, 75. Write an ALP to find the highest grade. **(06 Marks)**

OR

4   a. Write on ALP that adds the following two multiword numbers and saves the result:
        Data 1 = 548FB9963CE7H and
        Data 2 = 3FCD4FA23B8DH **(08 Marks)**
    b. Write an ALP to perform the following :
        i)   Clear the screen
        ii) Set the cursor at row 8 and column 5 of the screen.
        iii) Prompt "There is a message for you from VTU : to read it enter Y. If the user enters 'Y' or 'y' then the message "Hello! All the best for your exams" will appear on the screen. If the user enters any other key, then the prompt "No more messages for you" should appear on the next line. **(08 Marks)**

Module-3

5 a. Explain handling of overflow problem arised in addition of signed numbers with a suitable example. **(06 Marks)**

   b. Explain XLAT instruction with example. **(04 Marks)**

   c. Explain 74138 decoder configuration to enable the memory address F0000H to F7FFFH to connect four 8k RAMS. **(06 Marks)**

OR

6 a. Briefly explain the control word format of 8255 in I/O mode and BSR mode. Find the control word if PA = out, PB = in, PC0 – PC3 = in and PC4 – PC7 = out. Use port addresses of 300H – 303H for the 8255 chip. Then get data from port B and send it to port A. **(08 Marks)**

   b. 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 62H had been changed to 22H. Show how checksum detects the error. **(08 Marks)**

Module-4

7 a. Differentiate between RISC and CISC processors. **(06 Marks)**

   b. Explain ARM core data flow model with a neat diagram. **(06 Marks)**

   c. Discuss briefly how coprocessors can be attached to ARM processor. **(04 Marks)**

OR

8 a. Explain the architecture of a typical embedded device based on ARM core with a neat diagram. **(08 Marks)**

   b. Explain the concept of pipeline and interrupts used in ARM processor. **(08 Marks)**

Module-5

9 a. Explain the following instructions of ARM processor with suitable example.
       i) MLA   ii) QADD   iii) SMULL   iv) LSL. **(08 Marks)**

   b. Write an ALP to copy a block of data (Block 1) to another block (Block 2) using ARM instructions. **(08 Marks)**

OR

10 a. Write an ALP using ARM instructions that calls subroutine fact to find factorial of a given number. **(08 Marks)**

   b. Write short notes on memory access and branch instructions of ARM controller. **(08 Marks)**

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USN ☐☐☐☐☐☐☐☐☐☐   15CS45

Fourth Semester B.E. Degree Examination, June/July 2017
Object Oriented Concepts

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. How do name space helps in preventing pollution of the global namespace. **(04 Marks)**
   b. What is function polymorphism? Write a program in C++ using overloaded function area to find area of circle, triangle and rectangle. **(06 Marks)**
   c. Explain how one can bridge two classes using friend function. Write a C++ program to find the sum of two numbers using bridge friend function add(). **(06 Marks)**

OR

2 a. Can you overload constructor and destructor? Justify with suitable program. **(06 Marks)**
   b. What is reference variable? Explain. Also write a program in C++ to swap two int values and display the values before and after swapping. **(05 Marks)**
   c. What are static member of a class? Write a C++ program to count the number of objects created. **(05 Marks)**

Module-2

3 a. How "compile once and run anywhere" is implemented in JAVA? Discuss. **(04 Marks)**
   b. Write a program to calculate the average among the elements {8, 6, 2, 7} using for each in Java. How for each is different from for loop? **(06 Marks)**
   c. Explain type conversion, with an example. **(06 Marks)**

OR

4 a. List and explain the java buzzwords. **(08 Marks)**
   b. Explain the concepts of arrays in Java with examples. Also write a program that creates and initializes a four integer elements array. Find the sum and average of its values. **(08 Marks)**

Module-3

5 a. Briefly explain the role of interfaces while implementing multiple inheritances in Java. **(06 Marks)**
   b. Compare and contrast method overloading and method overriding with suitable examples. **(06 Marks)**
   c. When constructors are called in the class hierarchy? **(04 Marks)**

OR

6 a. With example, give two uses of super. **(05 Marks)**
   b. Define exception. Write a program which contains one method which will throw IllegalAcessException and use proper exception handlers so that exception should be printed. **(06 Marks)**
   c. Define package. What are the steps involved in creating user defined package with an example. **(05 Marks)**

Module-4

7 a. How synchronization can be achieved for threads in Java? Explain with syntax. (06 Marks)
   b. Explain the adaptor class with an example. (04 Marks)
   c. With the syntax explain the use of isAlive( ) and Join( ) methods. (06 Marks)

OR

8 a. What are the differences between suspending and stopping the threads? (05 Marks)
   b. Discuss delegation event model with suitable examples. (06 Marks)
   c. Explain inner class with example. (05 Marks)

Module-5

9 a. What are the two types of applets? Explain the skeleton of an apple. Enlist applet tags. (06 Marks)
   b. Write steps to create JTable, also write a program to demonstrate the same. (05 Marks)
   c. Explain the applet architecture and demonstrate how to pass parameters for font size and font name in applets. (05 Marks)

OR

10 a. Explain briefly the components and containers used in swings. (05 Marks)
    b. Explain JLabel and ImageIcon with program. (06 Marks)
    c. What are applets? Explain different stages in the lifecycle of an applet. (05 Marks)

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Fourth Semester B.E. Degree Examination, June/July 2017
Data Communication

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. What is data communication? With a neat diagram, explain the four basic topologies. **(05 Marks)**
   b. Explain TCP/IP protocol suite with Encapsulation and decapsulation concepts. **(08 Marks)**
   c. Explain different characteristics of periodic analog signal. Find the phase in degree and radian of a sine wave with offset $\frac{1}{4}$ cycle with respect to time '0' (zero). **(03 Marks)**

OR

2 a. Draw line code of the sequence 010011 using NRZ, NRZ-L, NRZ-I, Manchester, RZ and differential Manchester schemes. **(06 Marks)**
   b. Explain digital signal transmissions methods. **(06 Marks)**
   c. What is noiseless channel? Find out maximum bit rate in noiseless channel with bandwidth of 3000 Hz transmitting a signal with two signal level. **(04 Marks)**

Module-2

3 a. Explain PCM and quantization process with steps and example. **(08 Marks)**
   b. Explain amplitude shift keying modulation process. **(04 Marks)**
   c. Find out bit rate if available bandwidth is 100 kHz which spans from 200 to 300 kHz. Consider ASK with d = 1, r = 1. **(04 Marks)**

OR

4 a. What is multiplexing? define synchronous TDM with data rate management strategies. **(08 Marks)**
   b. What is spread spectrum? Explain FHSS and bandwidth sharing. **(08 Marks)**

Module-3

5 a. How does datawords and codewords is represented in block coding and also explain how can errors be selected and corrected by using block coding. **(10 Marks)**
   b. Find the code word using CRC given data is 1101 and generator is 1100. **(06 Marks)**

OR

6 a. With a neat diagram, explain any two protocols of noisy channel. **(12 Marks)**
   b. Explain the frame format of HDLC protocol. **(04 Marks)**

Module-4

7 a. What is channelization? List and explain the channelization protocols. **(12 Marks)**
   b. Describe Gigabit Ethernet. **(04 Marks)**

OR

8 a. Describe pure ALOHA and slotted ALOHA. **(06 Marks)**
   b. Explain Carrier Sense Multiple Access with Collision Detection (CSMA/CD) **(06 Marks)**
   c. Define Bluetooth and its architecture. **(04 Marks)**

Module-5

9 a. Explain satellite networks and its categories. **(12 Marks)**
   b. Write a short note on Fixed WiMAX. **(04 Marks)**

OR

10 a. Explain mobile IP with phases. **(12 Marks)**
   b. Write a short note on IPV6 addressing. **(04 Marks)**

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