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15MAT41

Fourth Semester B.E. Degree Examination, June/July 2018
Engineering Mathematics – IV

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　Max. Marks: 80

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

Module-1

1　a.　Use Taylor's series method to find y at x = 1.1, considering terms upto third degree given that $\frac{dy}{dx} = x + y$ and y(1) = 0.　**(05 Marks)**

　　b.　Using Runge-Kutta method, find y(0.2) for the equation $\frac{dy}{dx} = \frac{y-x}{y+x}$; y(0) = 1, taking h = 0.2.　**(05 Marks)**

　　c.　Given $\frac{dy}{dx} = x^2 - y$, y(0) = 1 and the values y(0.1) = 0.90516, y(0.2) = 0.82127, y(0.3) = 0.74918, evaluate y(0.4), using Adams-Bashforth method.　**(06 Marks)**

OR

2　a.　Using Euler's modified method, find y(0.1) given $\frac{dy}{dx} = x - y^2$, y(0) = 1, taking h = 0.1.　**(05 Marks)**

　　b.　Solve $\frac{dy}{dx} = xy$; y(1) = 2, find the approximate solution at x = 1.2, using Runge-Kutta method.　**(05 Marks)**

　　c.　Solve $\frac{dy}{dx} = x - y^2$ with the following data　y(0) = 0,　y(0.2) = 0.02,　y(0.4) = 0.0795, y(0.6) = 0.1762, compute y at x = 0.8, using Milne's method.　**(06 Marks)**

Module-2

3　a.　Using Runge-Kutta method of order four, solve $y'' = y + xy'$, y(0) = 1, y'(0) = 0 to find y(0.2).　**(05 Marks)**

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

　　c.　If α and β are two distinct roots of $J_n(x) = 0$ then prove that $\int_0^1 x J_n(\alpha x) J_n(\beta x) dx = 0$, if $\alpha \neq \beta$.　**(06 Marks)**

OR

4　a.　Given $y'' = 1 + y'$; y(0) = 1, y'(0) = 1, compute y(0.4) for the following data, using Milne's predictor-corrector method.
　　　y(0.1) = 1.1103　　　y(0.2) = 1.2427　　　y(0.3) = 1.399
　　　y'(0.1) = 1.2103　　　y'(0.2) = 1.4427　　　y'(0.3) = 1.699.　**(05 Marks)**

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

　　c.　Derive Rodrigue's formula $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n}\left[(x^2 - 1)^n\right]$.　**(06 Marks)**

Module-3

5 a. Derive Cauchy-Riemann equations in polar form. **(05 Marks)**

   b. Evaluate $\oint_C \dfrac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2(z-2)} \, dz$ where C is the circle $|z| = 3$, using Cauchy's residue theorem.

   (05 Marks)

   c. Find the bilinear transformation which maps $z = \infty$, i, 0 on to w = 0, i, ∞. **(06 Marks)**

OR

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

   b. If $u = \dfrac{\sin 2x}{\cosh 2y + \cos 2x}$, find the corresponding analytic function $f(z) = u + iv$. **(05 Marks)**

   c. Discuss the transformation $w = z^2$. **(06 Marks)**

Module-4

7 a. Derive mean and standard deviation of the binomial distribution. **(05 Marks)**

   b. If the probability that an individual will suffer a bad reaction from an injection of a given serum is 0.001, determine the probability that out of 2000 individual (i) exactly 3 (ii) more than 2 individuals will suffer a bad reaction. **(05 Marks)**

   c. The joint probability distribution for two random variables X and Y is as follows:

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

   Determine: i) Marginal distribution of X and Y   ii) Covariance of X and Y
   iii) Correlation of X and Y **(06 Marks)**

OR

8 a. Derive mean and standard deviation of exponential distribution. **(05 Marks)**

   b. In an examination 7% of students score less than 35% marks and 89% of students score less than 60% marks. Find the mean and standard deviation if the marks are normally distributed. Given $P(0 < z < 1.2263) = 0.39$ and $P(0 < z < 1.14757) = 0.43$. **(05 Marks)**

   c. The joint probability distribution of two random variables X and Y is as follows:

Y \ X	-4	2	7
1	1/8	1/4	1/8
5	1/4	1/8	1/8

   Compute: i) E(X) and E(Y)   ii) E(XY)   iii) COV(X, Y)   iv) $\rho(X, Y)$ **(06 Marks)**

Module-5

9 a. Explain the terms: i) Null hypothesis   ii) Type I and Type II errors. **(05 Marks)**

   b. The nine items of a sample have the values 45, 47, 50, 52, 48, 47, 49, 53, 51. Does the mean of these differ significantly from the assumed mean of 47.5? **(05 Marks)**

   c. Given the matrix $A = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$ then show that A is a regular stochastic matrix. **(06 Marks)**

OR

10 a. A die was thrown 9000 times and of these 3220 yielded a 3 or 4, can the die be regarded as unbiased? **(05 Marks)**

   b. Explain: i) Transient state   ii) Absorbing state   iii) Recurrent state **(05 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? **(06 Marks)**

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Fourth Semester B.E. Degree Examination, June/July 2018
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 $\begin{bmatrix} 5 & 3 & 14 & 4 \\ 0 & 1 & 2 & 1 \\ 1 & -1 & 2 & 0 \end{bmatrix}$ by reducing to echelon form. **(06 Marks)**

   b. Use Cayley-Hamilton theorem to find the inverse of the matrix $\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$. **(05 Marks)**

   c. Apply Gauss elimination method to solve the equations $x + 4y - z = -5$; $x + y - 6z = -12$; $3x - y - z = 4$ **(05 Marks)**

OR

2 a. Find all the eigen values and eigen vector corresponding to the largest eigen value of $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$. **(06 Marks)**

   b. Find the rank of the matrix by elementary row transformations $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \end{bmatrix}$. **(05 Marks)**

   c. Solve the system of linear equations $x + y + z = 6$; $2x - 3y + 4z = 8$; $x - y + 2z = 5$ by Gauss elimination method. **(05 Marks)**

Module-2

3 a. Solve $\dfrac{d^2y}{dx^2} + 4y = \tan 2x$ by the method of variation of parameters. **(06 Marks)**

   b. Solve $\dfrac{d^2x}{dt^2} + 5\dfrac{dx}{dt} + 6x = 0$, given $x(0) = 0$, $\dfrac{dx}{dt}(0) = 15$. **(05 Marks)**

   c. Solve $(D^2 + 5D + 6)y = e^x$. **(05 Marks)**

OR

4 a. Solve by the method of undetermined coefficients $(D^2 - 2D + 5)y = 25x^2 + 12$. **(06 Marks)**

   b. Solve $(D^2 + 3D + 2)y = \sin 2x$. **(05 Marks)**

   c. Solve $(D^2 - 2D - 1)y = e^x \cos x$. **(05 Marks)**

Module-3

5 a. Find the Laplace transforms of, (i) $t\cos^2 t$ (ii) $\dfrac{1 - e^{-t}}{t}$ **(06 Marks)**

   b. Find the Laplace transforms of, (i) $e^{-2t}(2\cos 5t - \sin 5t)$ (ii) $3\sqrt{t} + \dfrac{4}{\sqrt{t}}$. **(05 Marks)**

   c. Express the function, $f(t) = \begin{cases} t, & 0 < t < 4 \\ 5, & t > 4 \end{cases}$ in terms of unit step function and hence find its Laplace transform. **(05 Marks)**

OR

6   a. Find the Laplace transform of the periodic function defined by $f(t) = E\sin\omega t$, $0 < t < \dfrac{\pi}{\omega}$

    having period $\dfrac{\pi}{\omega}$. **(06 Marks)**

   b. Find the Laplace transform of $2^t + t\sin t$. **(05 Marks)**

   c. Find the Laplace transform of $\dfrac{2\sin t \sin 5t}{t}$. **(05 Marks)**

Module-4

7   a. Using laplace transforms method, solve $y'' - 6y' + 9 = t^2 e^{3t}$, $y(0) = 2$, $y'(0) = 6$. **(06 Marks)**

   b. Find the inverse Laplace transforms of, (i) $\dfrac{s^2 - 3s + 4}{s^3}$ (ii) $\dfrac{s+3}{s^2 - 4s + 13}$ **(05 Marks)**

   c. Find the inverse Laplace transforms of, (i) $\log\left(\dfrac{s+1}{s-1}\right)$ (ii) $\dfrac{s^2}{(s-2)^3}$ **(05 Marks)**

OR

8   a. Solve the simultaneous equations $\dfrac{dx}{dt} + 5x - 2y = t$, $\dfrac{dy}{dt} + 2x + y = 0$ being given $x = y = 0$ when $t = 0$. **(06 Marks)**

   b. Find the inverse Laplace transforms of $\cot^{-1}\left(\dfrac{s}{2}\right)$. **(05 Marks)**

   c. Find the inverse Laplace transforms of $\dfrac{2s^2 - 6s + 5}{s^3 - 6s^2 + 11s - 6}$. **(05 Marks)**

Module-5

9   a. For any three arbitrary events A, B, C prove that ,
       $P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(C \cap A) + P(A \cap B \cap C)$
       (04 Marks)

   b. A class has 10 boys and 5 girls. Three students are selected at random, one after the other. Find probability that, (i) first two are boys and third is girl (ii) first and third boys and second is girl. (iii) first and third of same sex and the second is of opposite sex.
       (06 Marks)

   c. In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. (i) what is the probability that mathematics is being studied ? (ii) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl? (iii) a boy?
       (06 Marks)

OR

10 a. State and prove Bayes theorem. **(04 Marks)**

   b. A problem in mathematics is given to three students A, B and C whose chances of solving it are $\dfrac{1}{2}, \dfrac{1}{3}$ and $\dfrac{1}{4}$ respectively. What is the probability that the problem will be solved?
       (06 Marks)

   c. A pair of dice is tossed twice. Find the probability of scoring 7 points. (i) Once, (ii) at least once (iii) twice.
       (06 Marks)

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CBCS Scheme

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15CS42

Fourth Semester B.E. Degree Examination, June/July 2018
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 essential attributes of good software? Explain the key challenger facing in software engineering. **(08 Marks)**
   b. Explain four steps in spiral model of requirements elicitation and analysis process. And why the understanding of requirements from stake holders is difficult task? Explain. **(08 Marks)**

OR

2 a. What is a software process model? Explain the types of software process models. **(05 Marks)**
   b. What is requirement specification? Explain various ways of writing system requirements. **(06 Marks)**
   c. Explain the different checks to be carried during requirement validation process. **(05 Marks)**

Module-2

3 a. Draw and explain use case modeling and sequence diagram for patient information system. **(10 Marks)**
   b. With a diagram, explain the phases in the Rational Unified Process (RUP). **(06 Marks)**

OR

4 a. Draw and explain state diagram of a microwave oven. **(07 Marks)**
   b. What is design pattern? Explain four essential elements of design pattern. **(05 Marks)**
   c. Explain the general models of open source licenses. **(04 Marks)**

Module-3

5 a. What is test driven development? With neat diagram, explain test driven development process. **(08 Marks)**
   b. With neat diagram, explain six stages of acceptance testing process. **(08 Marks)**

OR

6 a. With neat diagram, explain the software evolution process. **(05 Marks)**
   b. Explain three different types of software maintenance. **(03 Marks)**
   c. Draw a chart showing relative business value and system quality of legacy system management and explain four clusters of systems. **(08 Marks)**

Module-4

7   a.   For the set of tasks shown below draw the project scheduling using,
   i)   Activity bar chart
   ii)   Staff allocation chart **(10 Marks)**

Task	Duration (Days)	Dependencies
T_1	10	-
T_2	15	-
T_3	15	T_1 (M1)
T_4	10	-
T_5	10	T_2, T_4 (M3)
T_6	5	T_1, T_2 (M4)
T_7	20	T_1 (M1)
T_8	25	T_4 (M2)
T_9	15	T_3, T_6 (M5)
T_{10}	15	T_7, T_8 (M6)
T_{11}	10	T_9 (M7)
T_{12}	10	T_{10}, T_{11} (M8)

   b.   Explain briefly the algorithmic cost modeling and write the difficulties.   **(06 Marks)**

OR

8   a.   Write any four product and process standards.   **(04 Marks)**
   b.   Explain briefly the software review process.   **(06 Marks)**
   c.   Explain briefly the process of product measurement.   **(06 Marks)**

Module-5

9   a.   State and explain the principles of agile methods.   **(05 Marks)**
   b.   Write a note on pair programming.   **(06 Marks)**
   c.   List the advantages of SCRUM used in a telecommunication software development environment.   **(05 Marks)**

OR

10   a.   Explain the practices involved in the extreme programming.   **(10 Marks)**
   b.   How the agile methods are scaled? State the coping of agile methods for large system engineering.   **(06 Marks)**

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15CS43

Fourth Semester B.E. Degree Examination, June/July 2018
Design and Analysis of Algorithms

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1   a. Write an algorithm to find the maximum element in an array of n element. Give the mathematical analysis of this non-recursive algorithm. **(06 Marks)**

b. Explain the asymptotic notations BigO, BigΩ and big theta used to compare orders of growth of an algorithm. **(06 Marks)**

c. Explain with an example how a new variable count introduced in a program can be used to find the number of steps needed by a program to solve a particular problem instance. **(04 Marks)**

OR

2   a. Write a recursive function to find and print all possible permutations of a given set of n elements. **(05 Marks)**

b. Solve the recurrence relation : $M(n) = 2M(n-1) + 1$. Take $M(1) = 1$, $M(n)$ is given for $n > 1$. **(05 Marks)**

c. Define algorithm. What are the criteria that an algorithm must satisfy? **(06 Marks)**

Module-2

3   a. Write a function to find the maximum and minimum elements in a given array of n elements by applying the divide and conquer technique. **(06 Marks)**

b. Explain the divide and conquer technique. Give the general algorithm DAndC(P)[Where P is the problem to be solve] to illustrate this technique. **(04 Marks)**

c. Apply source removal method to obtain topological sort for the given graph in Fig.Q3(c). **(06 Marks)**
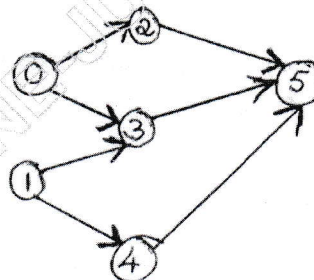

Fig.Q3(c)

OR

4   a. Explain the merge sort algorithm. Illustrate with an example and give the worst case efficiency of merge-sort. **(08 Marks)**

b. Apply quick sort algorithm to the following set of numbers.
65, 70, 75, 80, 85, 60, 55, 50, 45. **(08 Marks)**

Module-3

5 a. Apply greedy method to obtain an optimal solution to the knapsack problem given M = 60, $(w_1, w_2, w_3, w_4, w_5) = (5, 10, 20, 30, 40)$ $(p_1, p_2, p_3, p_4, p_5) = (30, 20, 100, 90, 160)$. Find the total profit earned. **(04 Marks)**

   b. Explain Huffman algorithm. With an example show the construction of Huffman tree and generate the Huffman code using this tree. **(06 Marks)**

   c. Apply Prim's algorithm to obtain a minimum spanning tree for the given weighted connected graph. [Fig.Q5(c)]. **(06 Marks)**
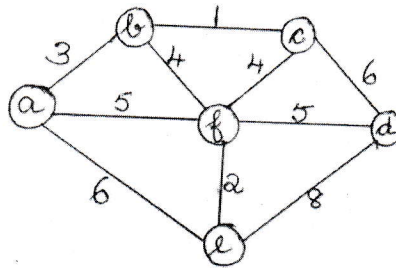

Fig.Q5(c)

OR

6 a. Explain the bottom up heap construction algorithm with an example. Give the worst case efficiency of this algorithm. **(08 Marks)**

   b. Apply single source shortest path problem assuming vertex a as source.[Refer Fig.Q6(b)]. **(08 Marks)**
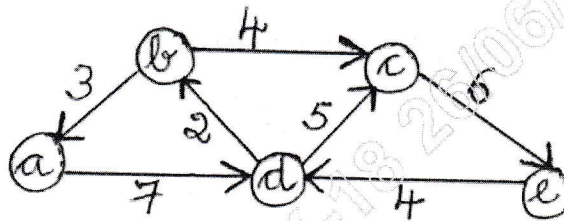

Fig.Q6(b)

Module-4

7 a. Explain multistage graph with an example. Write multistage graph algorithm using backward approach. **(08 Marks)**

   b. Apply Floyd's algorithm to solve all pair shortest path problem for the graph given below in Fig.Q7(b). **(08 Marks)**
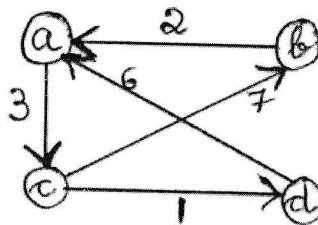

Fig.Q7(b)

OR

8   a. Explain Bellman Ford al to find shortest path from single source to all destinations for a directed graph with negative edge cost. **(08 Marks)**

   b. Apply Warshall's algorithm to the digraph given below in Fig.Q8(b) and find the transitive closure. **(08 Marks)**
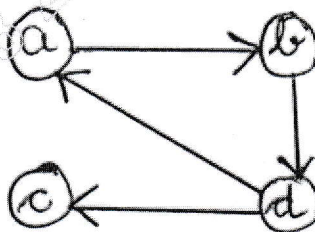

Fig.Q8(b)

Module-5

9   a. Apply backtracking method to solve subset–sum problem for the instance d = 30 and S = {5, 10, 12, 13, 15, 18}. Give all possible solutions. **(08 Marks)**

   b. Explain how travelling salesman problem can be solved using branch and bound technique. **(06 Marks)**

   c. Define deterministic and non deterministic algorithms. **(02 Marks)**

OR

10 a. What is Hamiltonian cycle? Explain the algorithm to find the Hamiltonian cycle in a given connected graph. Write the functions used for generating next vertex and for finding Hamiltonian cycles. **(09 Marks)**

   b. Apply the best-first branch-and-bound algorithm to solve the instance of the given job assignment problem. **(07 Marks)**

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

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15CS44

Fourth Semester B.E. Degree Examination, June/July 2018
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. What is a microprocessor? With a neat diagram explain the internal block diagram of 8086 microprocessor along with functions of each block and registers. **(10 Marks)**

     b. What is an addressing mode? List the addressing modes of 8086 μp with one example each (any six modes). **(06 Marks)**

OR

2   a. What are the assembler directives? Explain the following assembler directives:
(i) DB   (ii) Assume   (iii) OFFSET   (iv) PTR **(04 Marks)**

     b. What is a flag and flag register? Explain the format of flag register with a suitable example. **(06 Marks)**

     c. Write an assembly level program (ALP) to sort a given set of 'n' 16-bit numbers in descending order. Using Bubble sort algorithm to sort given elements. **(06 Marks)**

Module-2

3   a. Explain the following instructions with a suitable example:
(i) MOV   (ii) PUSH   (iii) LEA   (iv) SHR
(v) ROL   (vi) CMP   (vii) DAA   (viii) TEST **(08 Marks)**

     b. What is an interrupt? Explain various types with an interrupt vector table. **(08 Marks)**

OR

4   a. Explain the following instructions with a suitable example:
(i) XLAT   (ii) RCR   (iii) AAA   (iv) MUL
(v) DIV   (vi) LOOP   (vii) ROL   (viii) OR **(08 Marks)**

     b. Explain rotate instructions with an example. **(08 Marks)**

Module-3

5   a. With example, explain how to identify overflow and underflow using flags in a flag register for performing an arithmetic operation on 16-bit numbers. **(08 Marks)**

     b. Explain 74138 decoder configuration to enable the memory address 08000H to 0FFFFH to connect four 8K RAMS. **(08 Marks)**

OR

6   a. Briefly explain the control word format of 8255 IC in I/O mode and BSR mode. Find the control word if P_A = out, P_B = in , $P_{C0} - P_{C3}$ = in and $P_{C4} - P_{C7}$ = out. Use port address of 300H – 303H for the 8255 chip. Then get data from port A and send it to port B. **(08 Marks)**

     b. Write an assembly level program (ALP) to read P_B and check number of one's in a 8-bit data as P_A and display FFh on P_A if it is even parity else 00h on Port A (P_A) if it is an odd parity. **(08 Marks)**

Module-4

7   a. Compare CISC with RISC. **(05 Marks)**
    b. Explain registers used under various modes. **(05 Marks)**
    c. Explain ARM core data flow model with a neat diagram. **(06 Marks)**

OR

8   a. Explain the architecture of a typical embedded device based in ARM core with a neat diagram. **(08 Marks)**
    b. Explain the various fields in the current program status register. **(08 Marks)**

Module-5

9   a. Explain the following instructions of ARM processor with suitable example:
    (i) MVN   (ii) RSB   (iii) ORR   (iv) MLA
    (v) SMULL   (vi) LDR   (vii) SWP   (viii) SWPB   **(08 Marks)**
    b. Explain various formats of ADD instructions based on operands of ARM7 processor. **(04 Marks)**
    c. If $r_5 = 5$, $r_7 = 8$ and using the following instruction, write values of r_5, r_7 after execution MOV r_7, r_5, LSL ≠ 2 **(04 Marks)**

OR

10 a. Explain software interrupt instruction of ARM processor. **(06 Marks)**
    b. Explain various types of SWAP instructions with syntax and example. **(06 Marks)**
    c. What are the silent features of ARM instruction set? **(04 Marks)**

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15CS45

Fourth Semester B.E. Degree Examination, June/July 2018
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. State the important features of Object Oriented programming paradigm. **(08 Marks)**
   b. Write a C++ program to get employees details (empno, ename, bsalary(initialized to 1000 by constructor) and allowance) of Employee class through keyboard using the method Getdata( ) and display them using the method Dispdata( ) on console in the format empno, ename , bsalary, allowance. **(08 Marks)**

OR

2 a. Describe function Prototype, with an example. **(04 Marks)**
   b. Explain namespace, with an example. **(04 Marks)**
   c. Define Function Overloading and write a C++ program for finding areas of circle (PI * r * r), rectangle (ℓ * b) and square (x * x) by getting r, ℓ, b and x through keyboard and printing the areas on console using the method Area( ) applying the concept of function overloading. **(08 Marks)**

Module-2

3 a. State the features used in C++ which are eliminated in Java. Why? **(04 Marks)**
   b. Discuss briefly the concept of byte code in Java. **(04 Marks)**
   c. Explain the structure of a Java program and its keywords with an example. **(08 Marks)**

OR

4 a. How arrays are defined in Java? Explain with an example. **(04 Marks)**
   b. Elucidate how Java is a platform independent language, with neat sketches. **(06 Marks)**
   c. Write a Java program to print factorial of the number 'n' using for loop. **(06 Marks)**

Module-3

5 a. Explain package and its types and import command in Java with examples. **(08 Marks)**
   b. Write a Java program to define an interface called Area which contains method called Compute( ) and calculate the areas of rectangle (ℓ * b) and triangle (1/2 * b * h) using classes Rectangle and Triangle. **(08 Marks)**

OR

6 a. Define the role of Exception handling in software development. **(02 Marks)**
   b. Write a Java program for illustrating the exception handling when a number is divided by zero and an array has a negative index value. **(06 Marks)**
   c. Elucidate the concept of inheritance and its classifications in Java with sketches. **(08 Marks)**

Module-4

7 a. Define the concept of multithreading in Java and explain the different phases in the life cycle of a thread, with a neat sketch. **(08 Marks)**
   b. Discuss briefly Synchronization in Java (2). **(02 Marks)**
   c. Write an example Program for implementing static synchronization in Java. **(06 Marks)**

OR

8 a. Elucidate the two ways of making a class threadable, with examples.   (08 Marks)
   b. Describe the delegation event model and explain what happens internally at a button click.
                                                                              (08 Marks)

Module-5

9 a. Briefly explain Applets.   (03 Marks)
   b. Elucidate Lucidly the skeleton of an Applet.   (05 Marks)
   c. Write a Java program to play an audio file using Applet.   (08 Marks)

OR

10 a. Write the advantages of swing over AWT.   (04 Marks)
   b. Write a brief note on Containers in swing.   (04 Marks)
   c. Write a swing program for displaying anyone of the options. C , C++ , Java, Php through the selection of Combo box by clicking show button.   (08 Marks)

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Fourth Semester B.E. Degree Examination, June/July 2018
Data Communication

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a. Define Data Communication. Explain any two fundamental characteristics of Data communication and basic network topology.   **(08 Marks)**
     b. List out the causes of transmission impairment. Explain the characteristics of analog and digital signals.   **(08 Marks)**

OR

2   a. List out the network criteria. Explain TCP/IP protocol suite with neat diagram.   **(08 Marks)**
     b. Define Line coding and list out its characteristics. Represent the following sequence 1011001011 using polar and bipolar scheme.   **(08 Marks)**

Module-2

3   a. List out the types of transmission modes. Explain the steps of pulse code modulation process, with an example.   **(08 Marks)**
     b. Explain FSK and QAM modulation process, with suitable example.   **(08 Marks)**

OR

4   a. Define Multiplexing. Explain synchronous TDM with data rate management and its limitations.   **(10 Marks)**
     b. List out three phases of circuit – switched network. Explain Data gram – switched network.   **(06 Marks)**

Module-3

5   a. Define Cyclic code. Find the codeword using CRC for given data word 1001 and divisor 1011.   **(08 Marks)**
     b. Define Frames. Explain the steps of flow control at data link layer with diagram. **(08 Marks)**

OR

6   a. Explain Stop – and – Wait protocol with neat diagram.   **(08 Marks)**
     b. Explain the frame structure of PPP protocol, with neat diagram.   **(08 Marks)**

Module-4

7   a. List out the Random Access Protocols and explain CSMA/CA.   **(10 Marks)**
     b. List out channelization protocols. Explain CDMA.   **(06 Marks)**

OR

8   a. Explain Wireless – LAN, with neat architecture and list out its characteristics.   **(08 Marks)**
     b. Explain the layers of Bluetooth, with neat diagram.   **(08 Marks)**

Module-5

9   a. List the difference between IPV_4 and IPV_6. Explain any two methods of converting from IPV_4 to IPV_6.   **(08 Marks)**
     b. Explain the IP Datagram, Header format, with neat diagram.   **(08 Marks)**

OR

10   a. Define Home address in mobile IP. Explain three phases for communication in mobile IP.
                                                                                             (08 Marks)
     b. Define WiMax. Explain fourth generation (4G) of cellular telephone.   **(08 Marks)**

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