Code: 7GC32

II B.Tech. I Semester Regular Examinations November 2018

Engineering Mathematics – III

(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Find a real root of the equation $x^3 - 3x - 5 = 0$ by the method of false position correct to three decimal places.   7M

   b) Find the real root of the equation $x = e^{-x}$ using Newton-Raphson method.   7M

OR

2. a) Employ Taylor's method to obtain the approximate values of y at $x = 0.1, 0.2$ for the differential equation $\dfrac{dy}{dx} = x - y^2,\ y(0) = 1.$ 7M

   b) Apply Runge-Kutta method of order 4, compute $y(0.2)\ and\ y(0.4)$ from the equation

   $\dfrac{dy}{dx} = x + y,\ y(0) = 1.$ 7M

UNIT–II

3. a) The population of a town in the decennial census was given below

Year : x	1891	1901	1911	1921	1931
Population: y (in thousands)	46	66	81	93	101

   Estimate the population for the year 1895.   7M

   b) Use Lagrange's interpolation formula to find the value of y when $x = 3.5$ from the following table

x	0	1	3	4
y	-12	0	12	24

   7M

OR

4. a) Find the first and second derivatives of the function tabulated below at the point $x = 1.5$

x	1.5	2.0	2.5	3.0	4.0
y	3.375	7.0	13.625	38.875	59

   7M

   b) Evaluate $\displaystyle\int_0^1 \dfrac{dx}{1+x^2}$ by using

   (i) Trapezoidal rule (ii) Simpson's $\dfrac{1}{3}$ rule, (iii) Simpson's $\dfrac{3}{8}$ rule with $h = 0.5\ and\ 0.25$ 7M

UNIT–III

5. a) Find the values of a, b and c so that $y = a + bx + cx^2$ is the best fit to the data

x	0	1	2	3	4
y	1	0	3	10	21

7M

   b) Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$

7M

OR

6. a) Determine the values of a and b by the method of least squares such that $y = ae^{bx}$ fits the following data

x	0	1	2	3
y	1.05	2.10	3.85	8.30

7M

   b) Solve $x^2 \dfrac{\partial u}{\partial x} + y^2 \dfrac{\partial u}{\partial y} = 0$ by employing the method of separation of variables.

7M

UNIT–IV

7. Prove that $x^2 = \dfrac{f^2}{3} + 4\sum_{n=1}^{\infty}(-1)^n \dfrac{\cos nx}{n^2}$, $-f < x < f$ by using Fourier series and hence

show that $\sum_{n=1}^{\infty} \dfrac{1}{n^2} = \dfrac{f^2}{6}$

14M

OR

8. Obtain a half range cosine series for $f(x) = \begin{cases} kx, & 0 \le x \le l/2 \\ k(l-x), & l/2 \le x \le l \end{cases}$

and deduce the sum of the series is $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + \ldots = \dfrac{f^2}{8}$

14M

UNIT–V

9. a) Find the Fourier transform of $f(x) = \begin{cases} a^2 - x^2, & for\ |x| \le a \\ 0, & for\ |x| > a \end{cases}$

7M

   b) Find the Fourier cosine transform of e^{-ax} $(a > 0)$. Hence Evaluate $\displaystyle\int_0^{\infty} \dfrac{\cos\}x}{x^2 + a^2}dx$

7M

OR

10. Obtain the Fourier sine transfromation of

$f(x) = \begin{cases} 4x, & for\ 0 < x < 1 \\ 4 - x, & for\ 1 < x < 4 \\ 0, & for\ x > 4 \end{cases}$

14M

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II B.Tech. I Semester Regular Examinations November 2018
Advanced Data Structures Through C++
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Discuss different ways of defining member functions with example   10M

   b) Define a class and an object with syntax.   4M

OR

2. a) In how many ways parameters can be passed to the functions? Explain each method with an example.   7M

   b) Explain different exception handling mechanisms.   7M

UNIT–II

3. a) Compare and contrast Constructors and Destructors.   7M

   b) Develop a C++ program to add two objects and store result in another object using Operator Overloading.   7M

OR

4. a) Demonstrate multi-level inheritance with a C++ program.   7M

   b) How Bubble sort algorithm complexity values are computed? Explain.   7M

UNIT–III

5. a) Define stack. Describe the operations of stack data structure with algorithms.   10M

   b) Compare and contrast linear queue and circular queue.   4M

OR

6. a) Describe various collision resolution techniques.   6M

   b) Define Dictionary and discuss various methods used to maintain dictionary.   8M

UNIT–IV

7. a) Define Binary Tree. Demonstrate its operations with suitable examples.   10M

   b) List the drawbacks of Binary Search Trees.   4M

OR

8. a) Write an algorithm for the following Binary Search Tree deletion operations.

   i). Node with right child   ii). Node with left child   iii). Node with no child.   9M

   b) Describe the computation of balance factor in AVL Trees   5M

UNIT–V

9. a) Draw a B-Tree of degree 3 and explain search operation over it.   7M

   b) How insertion and deletion can be performed over Compressed Tries? Explain with an example.   7M

OR

10. a) Describe Boyer- Moore algorithm with an example.   7M

    b) Illustrate Krunth-Morris-Pratt algorithm and what is failure function in it. Also mention its algorithm complexity.   7M

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II B.Tech. I Semester Regular Examinations November 2018
Database Management Systems
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) What is data abstraction? Explain with examples, three levels of data abstraction. 7M
   b) Define database manage system? Discuss the applications of database systems. 7M

OR

2. a) List and describe the different types of database users. 7M
   b) Write about database architecture. 7M

UNIT–II

3. a) What is an E-R model? Explain with examples, relationship and relationship sets in E-R model. 7M
   b) Discuss with example, key constraint and participation constraints. 7M

OR

4. a) What are foreign key constraints? Specify foreign constraints in SQL. 7M
   b) What are key constraints? Specify key constraints in SQL. 7M

UNIT–III

5. Discuss with examples, data manipulation commands in SQL. 14M

OR

6. a) Briefly discuss about SQL correlated queries with examples. 7M
   b) Explain with examples, UNION and INTERSECT set operators in SQL. 7M

UNIT–IV

7. a) List and explain the problems caused by redundancy. 7M
   b) What is normal form? What are the conditions are required for a relation to be in 1NF, and 2NF and explain with example. 7M

OR

8. a) Write about functional dependencies and BCNF. 7M
   b) Explain with example, dependency preserving decomposition 7M

UNIT–V

9. a) Explain lock based concurrency protocol. 7M
   b) Write short notes on transaction support in SQL. 7M

OR

10. a) Explain about intuition for tree indexes. 7M
    b) Briefly discuss about Indexed Sequential Access Method. 7M

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R-17

Code: 7G134

II B.Tech. I Semester Regular Examinations November 2018
Discrete Mathematics
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Obtain the PCNF of formula (~P   R) ∧ (Q   P)   7M

    b) Define Tautology with example.   7M

OR

2. a) Explain about free and bounded variables in detail in the context of predicate logic.   7M

    b) Show that the following premises are inconsistent.

        If Jack misses many classes through illness, then he fails high school.

        If Jack fails high school, then he is uneducated.

        If Jack reads a lot of books, then he is not uneducated.

        If Jack misses many classes through illness and reads a lot of books.   7M

UNIT–II

3. a) Let A be the set of factors of a particular positive integer m and let relation
        R= {(x, y) | x ∈ A ∧ y ∈ A ∧ (x divides y)}. Draw the Hasse diagram for

                        i. m=30   ii. m=45   7M

    b) Show that f(y)=y/2 is a partial recursive function.   7M

OR

4. a) Given A={2, 3, 4}, B={2, 5, 6, 7}. Construct examples of each of the following

        i. All injective mappings from A to B

        ii. All surjective mappings from A to B which is not injective.

        iii. iii. All bijective mappings from B to A.   6M

    b) Explain the properties of Binary relation with examples.   8M

UNIT–III

5. a) Let ({a,b},=) be a semi group ,where a*a=b , show that a*b=b*a and b*b=a.   7M

    b) Let the set Q of all rational numbers and the operation * is defined by
        a*b=a+b-ab. Show that, under this operation, Q form commutative monoid.   7M

OR

6. a) How many 5 digit number can be composed of the digit in the number
        1 2 3 3 4 2 3 3.   7M

    b) How many 6 digit numbers without repetition of digits are there such that the digits are all non zero and 1 and 2 do not appear consecutively in either order?   7M

UNIT–IV

7. a) Find a generating function for the recurrence relation $a_{n+1} - a_n = 3^n$ where $n \geq 0$ and $a_0 = 1$. Hence solve the relation. 7M

   b) Find the coefficient of x^{27} in the function $(x^4 + 2x^5 + 3x^6 + \ldots\ldots)^5$ 7M

OR

8. a) Solve the recurrence relation $a_n - 4a_{n-1} + 3a_{n-2} = 0$ for $n \geq 2$ with initial conditions $a_0 = 2$ and $a_1 = 4$ by using generating functions. 7M

   b) Solve the Recurrence Relation $a_n + 6a_{n-1} + 12a_{n-2} + 8a_{n-3} = 3^n$. 7M

UNIT–V

9. a) Define bipartite graph and planar graph. Give an example to show that $K_{3,3}$ is non planar . 7M

   b) Find the minimal spanning tree for the following graph using Kruskal's algorithm.
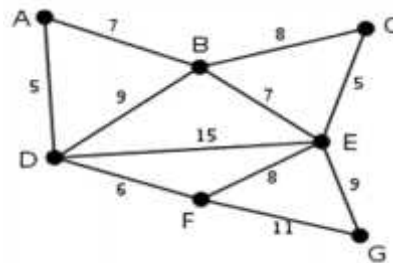
   7M

OR

10 a) Show that a tree with *n* vertices has *n-1* edges. 7M

   b) Define the following and give suitable example for each
      i. Euler Circuit
      ii. Hamiltonian Circuit. 7M

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Hall Ticket Number :

UNIT–I

1. a)   i. Solve the following.

i.i) $(2BC.A)_{16}$ = (_____)$_8$ i.ii) $(ABC.25)_{16}$ = (_____)$_2$. i.iii) $(AF0)_{16}$ = (_____)$_2$

ii) What is self complementary code? Explain with the example   7M

b)
i)   Expand $A + B\bar{C} + AB\bar{D} + ABCD$ to min terms and max terms.

ii) State commutative law and associative law   7M

OR

2. a)   i) Perform the following using 2's complement.

i.i) 11010 – 1101   i.ii) 101011 – 100110

ii) Realize NAND Gate using OR Gates   7M

b)   i) Obtain the truth table for the function F = xy + xy' + y'z

ii) Prove that the sum of all min terms of a Boolean function for three variables is 1.   7M

UNIT–II

3. a)   Obtain the minimal SOP expression for $\Sigma m(2,3,5,7,9,11,12,14,15)$ and implement using NAND gates.   10M

b)   i)   Why are NAND and NOR gates called universal gates?

ii)   Implement Full-adder using NAND gates only.   4M

OR

4. a)   Simplify the following Boolean expressions using K-map and implement them using NAND gates:

F(W, X, Y, Z) = XZ + WXY + WXY + WYZ + WYZ.   10M

b)   Implement Ex-OR gate using NoR gates.   4M

UNIT–III

5. a)   Implement a Full-adder using two half adder and one OR gate.   7M

b)   Implement the function f (a,b,c) = Σ m(1,3,5,6) using 4x1MUX.   7M

OR

6. a)   Design and implement a two bit comparator using logic gates.   7M

b)   With neat diagram, explain 3 to 8 line decoder.   7M

UNIT–IV

7. a)   Draw the circuit diagram of S-R Flip-flop with NAND gates and explain its operation with the help of a truth table.   7M

b)   Convert SR Flip-Flop to JK Flip-Flop.   7M

OR

8. a)   Define a register. Construct a shift register from S-R flip-flops. Explain its working.   7M

b)   Draw the excitation table of SR, T and D-flip flop.   7M

UNIT–V

9. a)   Implement the two Boolean functions with a PLA.

F1(A,B,C) = $\Sigma m(0,2,3,6)$ F2(A,B,C) = $\Sigma m(1,2,5,6)$ 7M

b)   Design a synchronous mod-6 counter using JK flip-flop.   7M

OR

10. a)   Design a mod-8 synchronous counter using D flip-flops. Give all the steps.   8M

b)   Compare programmable logic devices PROM, PLA and PAL.   6M

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Code: 7G135

R-17

II B.Tech. I Semester Regular Examinations November 2018

Web Programming

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Why HTML technology is not sufficient for e-commerce applications. Justify your answer.   7M

   b) Explain any five text formatting tags in HTML. Give an example.   7M

OR

2. a) Illustrate with an example the concept of ordered list, un-ordered list and definition list   10M

   b) How hyperlinks are created. Explain with an example.   4M

UNIT–II

3. a) How to insert image and audio in a HTML page. Give an example.   4M

   b) Write HTML code to create a form to the web page. The form should have text box, password box, radio button, check box, List Box, Text Area and submit buttons.   10M

OR

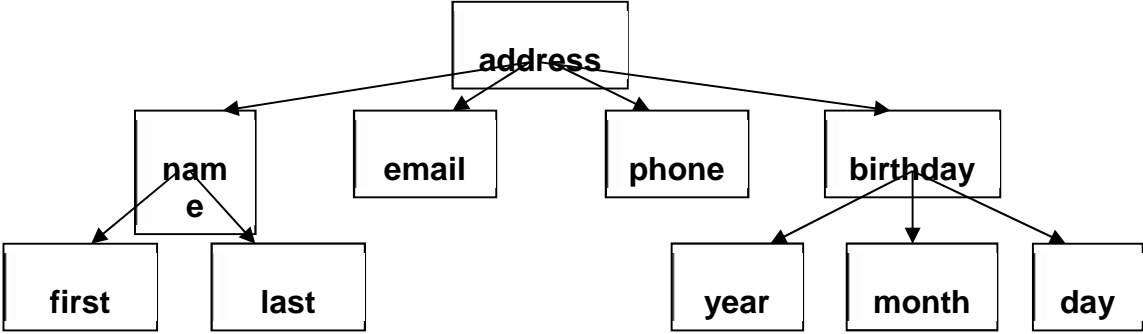4. Write a HTML code to create the following table using HTML <table> elements and attributes.

S.No	Reg. No.	Branch	Percentage
1	BCE001	CSE	72%
2	BCE002		75%
3	BEE015	ECE	73%
4	BEE006		

14M

UNIT–III

5. a) What is CSS? Explain the ways in which CSS can be included in a HTML.   7M

   b) With an example illustrate the usage of any five font style properties using CSS.   7M

OR

6. a) Create an XML for the data having the following structure.

7M

   b) What is DTD explain with an example.   7M

UNIT–IV

7. a) What are the merits and de-merits of client side scripting   4M

   b) Write a Javascript program to display prime numbers between 1 to 100   10M

OR

8. A six-sided die is rolled for 5000 times. Each time, the die is rolled, count the face of the die and display number of times each face is rolled. Write a program using Javascript and use random() function to indicate the face of the die.   14M

UNIT–V

9. a) What is the use of load() method in jQuery. Give an example.   7M

   b) Write a basic code for adding jquery library to pages?   7M

OR

10. a) Name the jQuery method which is used to perform an asynchronous HTTP request?   4M

    b) What are the advantages of using jQuery over JavaScript in ASP.NET web application?   10M

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