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R-17

Code: 7GC32

II B.Tech. I Semester Supplementary Examinations May 2019

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)

UNIT-I

1. a) Find a real root of the equation $x^3 - 2x - 5 = 0$ using bisection method correct to three decimal places. 7M
- b) Find the real root of the equation $\sin^2 x + 1 = x^2$ using Newton-Raphson method. 7M

OR

2. a) Employ Euler's method to obtain the approximate value of y at $x = 1.0$ for the differential equation $\frac{dy}{dx} = x - y^2$, $y(0) = 1$. 7M
- b) Apply Runge-Kutta method of order 4, compute $y(0.2)$ and $y(0.4)$ from the equation $\frac{dy}{dx} = x + y$, $y(0) = 1$. 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 1925. 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 $\int_0^1 \frac{dx}{1+x^2}$ by using

(i) Trapezoidal rule (ii) Simpson's $\frac{1}{3}$ rule and (iii) Simpson's $\frac{3}{8}$ rule with $h = 0.5$ and 0.125

7M

UNIT-III

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

x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

7M

- b) Solve $(p^2 + q^2)y = qz$ using Charpit's method.

7M

OR

6. a) Fit a second degree polynomial to the following data by the method of least squares

x	10	12	15	23	20
y	14	17	23	25	21

7M

- b) Using the method of separation of variables,

solve $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$, when $u(0, y) = 8e^{-3y}$

7M

UNIT-IV

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

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

14M

OR

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

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

14M

UNIT-V

9. Find the Fourier sine and cosine transforms of e^{-ax} ($a > 0$). Hence Evaluate the

integrals $\int_0^{\infty} \frac{x \sin \} x}{x^2 + a^2} dx$ and $\int_0^{\infty} \frac{\cos \} x}{x^2 + a^2} dx$

14M

OR

10. Obtain the Fourier sine transformation of

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

14M

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R-17

Code: 7G131

II B.Tech. I Semester Supplementary Examinations May 2019

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)

UNIT-I

1. a) What are the static class members? Explain each in detail. 9M
- b) How access control is provided in C++. 5M

OR

2. a) Define class scope. Explain this concept with an example. 7M
- b) C++ provides a mechanism in which non-member can have access to private member of a class. Justify? 7M

UNIT-II

3. a) Identify the purpose of operator overloading and demonstrate operator overloading for Unary operator. 7M
- b) Define Polymorphism. How virtual function avoids ambiguity in multipath inheritance. 7M

OR

4. a) Compare Time and Space complexity. Explain with suitable examples. 7M
- b) Demonstrate an abstract class with a suitable C++ program. 7M

UNIT-III

5. a) Demonstrate ADT implementation of Stack using C++ program. 9M
- b) Define Hashing. Explain about hash functions. 5M

OR

6. a) Explain the operations performed on Linear list with suitable examples. 8M
- b) Compare Double Hashing and Extendable Hashing. 6M

UNIT-IV

7. a) Define BST. Demonstrate its operations with suitable examples. 7M
- b) Demonstrate Binary Tree Traversal Techniques with algorithms. 7M

OR

8. a) Demonstrate Priority Queue implementation using Heaps. 7M
- b) Define AVL Tree. Demonstrate its operations with suitable examples 7M

UNIT-V

9. a) Demonstrate insertion and deletion operations in B-Tree with example. 8M
- b) What is a Red-Black Tree? List its properties. 6M

OR

10. a) What is the role of Tries in pattern Matching? What are the different Tries? Explain Applications of Tries. 9M
- b) Create a Red-Black Tree by inserting the following sequence of numbers: 8, 18, 5, 15, 17, 25, 40 and 80. 5M

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Code: 7G132

II B.Tech. I Semester Supplementary Examinations May 2019

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)

UNIT-I

- 1. a) List and explain the disadvantages of file processing systems. 10M
- b) Write about instances and schemas. 4M

OR

- 2. a) Write short notes on data manipulation language and data definition language for relational databases. 10M
- b) Write about the functions of database administrator. 4M

UNIT-II

- 3. a) What is an E-R model? Explain with suitable examples, entity, entity sets, and attributes. 7M
- b) What is aggregation in E-R model? Explain it with an example. 7M

OR

- 4. Explain logical database design: ER to Relational. 14M

UNIT-III

- 5. a) Briefly discuss about data definition commands in SQL. 7M
- b) Write short notes on creating view and destroying view in SQL. 7M

OR

- 6. a) Briefly discuss about SQL join operators with examples. 7M
- b) Write short notes on triggers. 7M

UNIT-IV

- 7. a) What is normal form? Explain with example, 3NF and BCNF. 10M
- b) Write about the problems related decomposition. 4M

OR

- 8. a) Briefly discuss about lossless-join decomposition with example. 7M
- b) Illustrate multivalued dependencies and fourth normal form with example. 7M

UNIT-V

- 9. a) What is transaction? List and explain the properties of transaction. 7M
- b) Write motivation for concurrent execution of transactions. Explain with example, serializable schedule. 7M

OR

- 10. a) Explain in detail about ISAM. 7M
- b) Write short notes on B⁺ trees. 7M

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Code: 7G134

II B.Tech. I Semester Supplementary Examinations May 2019

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)

UNIT-I

1. a) show that $\neg(P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Leftrightarrow (\neg P \vee Q)$ 7M
- b) show that $(\neg P \wedge (\neg Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R) \Leftrightarrow R$ 7M

OR

2. a) Obtain the principal conjunctive normal form of the statement $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$ 7M
- b) Show that SvR is a valid conclusion of the premises $(P \vee Q), (P \rightarrow R), (Q \rightarrow S)$ using rules of Inference. 7M

UNIT-II

3. a) Define the following and give suitable examples for each
 - i. Lattice
 - ii. Sub lattice
 - iii. Complemented lattice 6M
- b) Let n be a positive integer and S_n be the set of all divisors of n. Let D denote the relation of "division". Draw the diagrams of lattices (S_n, D) for n=6,8, 24 and 30. 8M

OR

4. a) Give an example of a relation which is symmetric, antisymmetric, compatibility and transitive. 7M
- b) Let $Z = \{-2, -1, 0, 1, 2, 3, \dots\}$ and Relation R is defined as $R = \{(x, y) / x - y \text{ is divisible by } 3\}$ find the relations on Z. 7M

UNIT-III

5. a) Let $(\{a, b\}, *)$ be a semi group where $a * a = b$ show that i) $a * b = b * a$ ii) $b * b = a$. 7M
- b) Show that every cyclic group is abelian group. 7M

OR

6. a) How many arrangements are there of the set $\{8a, 6b, 7c\}$ in which 'a' is an at least one side of another 'a'. 7M
- b) Prove by pigeon hole principle that in a group of 61 people, at least 6 people were born in the same month. 7M

UNIT-IV

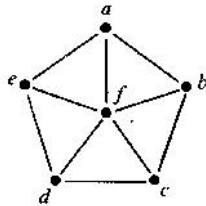
7. a) Find the coefficient of x^{18} in the following product
 $(x+x^2+x^3+x^4+x^5)(x^2+x^3+x^4+\dots\dots\dots)^5$ 7M
- b) Find a generating function for the recurrence relation
 $a_{n+2} - 5a_{n+1} + 6a_n = 2$ where $n \geq 0$ and $a_0=3, a_1=7$. Hence solve the relation. 7M

OR

8. a) Solve the Recurrence Relation $a_n - 7a_{n-1} + 10a_{n-2} = 0$ where $a_0=1$ and $a_1=41$. 7M
- b) Solve the Recurrence Relation $a_n - 6a_{n-1} + 8a_{n-2} = 3^n$ where $a_0=3$ and $a_1=7$. 7M

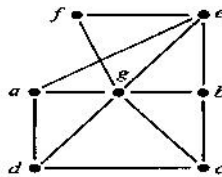
UNIT-V

9. a) Define chromatic number. Find the chromatic number of the following graph.



7M

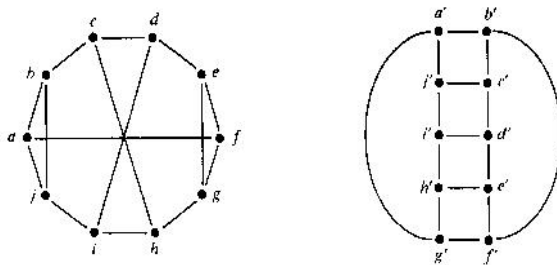
- b) Explain the DFS algorithm. Using DFS find the spanning tree of the following graph.



7M

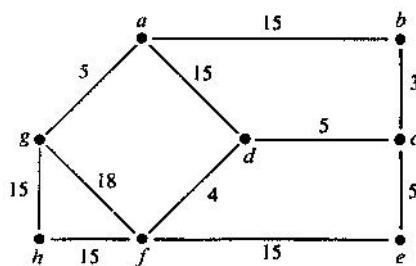
OR

10. a) Define Isomorphism. Verify whether the following graphs are isomorphic or not.



7M

- b) Illustrate Prim's algorithm to find a minimal spanning tree for the weighted graph given below.



7M

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II B.Tech. I Semester Supplementary Examinations May 2019

Digital Logic Design

(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)

UNIT-I

1. a) i) Convert $(4057.06)_8$ to binary code. 7M
 ii) What is reflection code? Give Example 7M
 b) i) Perform the subtraction in Excess-3 code using the 10's complement method: $597-239$.
 ii) State De Morgan's theorem for three variables 7M

OR

2. a) i) Prove that $\overline{(A + \overline{BC})} (\overline{AB} + \overline{ABC}) = \overline{ABC}$. 7M
 ii) Implement OR Gate using NAND Gates 7M
 b) i) Reduce the following Boolean expression to 3 literals. $[CD' + A]' + A + CD + AB$
 ii) Perform subtraction using 2's complement: $1100010 - 1100111$ 7M

UNIT-II

3. a) Simplify the following expression into sum of products using Karnaugh map:
 $F(A, B, C, D) = (1, 3, 4, 5, 6, 7, 9, 12, 13)$ 10M
 b) Show that the dual of the exclusive-OR is equal to its complement 4M

OR

4. a) Simplify the following Boolean expressions using K-map and implement them using NAND gates:
 $F(W, X, Y, Z) = XZ + WXY + WXY + WYZ + WYZ$. 7M
 b) Minimize the function $f = \sum m(0,2,4,6,7,8,10,12,13,15)$ using K-Map and obtain SOP form of it 7M

UNIT-III

5. a) Design 4-bit binary to Gray code converter. 7M
 b) Implement the function $f(A,B,C) = \sum m(0,2,5,7)$ using 4x1 MUX. 7M

OR

6. a) Implement a full-adder circuit with a decoder and two OR gates. 7M
 b) Realize the function $\sum m(0,3,5,6,7)$ using 8:1 multiplexer 7M

UNIT-IV

7. a) With the help of conversion table, K-map and the logic diagram explain the steps used to convert a J-K flip-flop to a D flip-flop. 7M
 b) What is difference between latch and flip flop? Explain about clocked RS flip flop using NAND gates 7M

OR

8. a) With a neat diagram, explain master slave JK Flip Flop 7M
 b) Explain the operation of universal shift register. 7M

UNIT-V

9. a) Draw and explain the operation of 4 bit ring counter. 7M
 b) i) Compare PLA with PROM. 7M
 ii) What is ROM? List the different types of ROMs 7M

OR

10. a) Draw and explain 4-bit Johnson counter using D-flip flop. 7M
 b) Implement the following functions using PLA.
 $A(x,y,z) = m(1,2,4,6)$
 $B(x,y,z) = m(0,1,6,7)$
 $C(x,y,z) = m(2,6)$ 7M

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Code: 7G135

II B.Tech. I Semester Supplementary Examinations May 2019

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)

UNIT-I

1. a) List and explain the attributes of <body> tag and <frame> tag. 10M
- b) List and explain the important applications of internet in brief. 4M

OR

2. a) How to create lists in HTML? What are the different types of Lists? Explain with an example. 10M
- b) Write a HTML code to navigate between two web pages using <a href> tag. 4M

UNIT-II

3. Write a HTML code to create a BIODATA form for displaying the user details. Name, Phone Number should be accepted as a Textbox, address should be accepted as a Textarea. For gender use Radio Button and for hobbies (Reading, Cooking, Watching TV, Playing) use check Box. 14M

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) Write DTD and XSD for the following xml document

```
<?xml version = "1.0" ?>
```

```
<address>
```

```
  <name>
```

```
    <first>Alice</first>
```

```
    <last>Lee</last>
```

```
  </name>
```

```
  <email>alee@aol.com</email>
```

```
  <phone>123-45-6789</phone>
```

```
  <birthday>
```

```
    <year>1983</year>
```

```
    <month>07</month>
```

```
  <day>15</day>
```

```
  </birthday>
```

```
</address>
```

10M

- b) Distinguish between DTD and XSD.

4M

OR

6. a) With an example, describe CSS style properties associated with text formatting. 7M
b) With an example, describe CSS style properties associated with BOX model. 7M

UNIT-IV

7. a) What are the merits and de-merits of client side scripting 4M
b) Write a javascript program that displays "Good Morning", or "Good Afternoon" or "Good Evening" based on the time extracted from the Date(). 10M

OR

8. Create an online application form and validate the fields email_id and phone number using javascript program. 14M

UNIT-V

9. a) Explain the role of jQuery. 4M
b) Write a jQuery code to apply the two different colors on alternate rows in a table. 10M

OR

10. Name any five jQuery Events. Illustrate the usage of those events with an example. 14M