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**R-15**

**Code: 5G131**

II B.Tech. I Semester Supplementary Examinations August 2021

**Advanced Data Structures Through C++**

( Common to CSE & IT )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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**UNIT-I**

1. a) Define function? Explain about inline function with example 6M
  - b) Describe the purpose of friend functions with suitable examples 8M
- OR**
2. a) Illustrate the significance of access specifiers in a class of C++? 7M
  - b) How do you create a static member function? Explain with example 7M

**UNIT-II**

3. What is function overloading? Explain in detail with examples 14M
- OR**
4. Define inheritance. Discuss types of inheritance with examples 14M

**UNIT-III**

5. a) What are the advantages of stacks? 4M
  - b) Illustrate an implementation of stack ADT in C++ with example. 10M
- OR**
6. a) Explain the different methods that are used to calculate hash functions? 7M
  - b) How do you resolve collision explain any two collision resolving methods? 7M

**UNIT-IV**

7. a) Define BST. Demonstrate its operations with suitable examples 7M
  - b) Demonstrate Priority Queue using Heaps with examples 7M
- OR**
8. a) What is an AVL Tree? Explain various steps for AVL search tree insertion with illustrations. 7M
  - b) Write an algorithm for in-order traversal of a binary tree. Explain with an example 7M

**UNIT-V**

9. Define splay tree. Give the algorithms for insertion and deletion operations on splay trees. 14M
- OR**
10. Explain an algorithm with an example for Brute-Force pattern matching, and write a C++ program. 14M

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Hall Ticket Number :

R-15

Code: 5G431

II B.Tech. I Semester Supplementary Examinations August 2021

**Discrete Mathematics**

( Common to CSE &amp; IT )

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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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Define Compound Statement and explain all the connectives.	10M	CO1	L2
b) Construct truth table for $(P \vee Q) \vee (P \vee \sim Q)$	4M	CO1	L6
<b>OR</b>			
2. a) Define Normal Form and explain the different types of Normal Forms	8M	CO1	L2
b) Obtain the PDNF for $\sim P \vee Q$	6M	CO1	L2
<b>UNIT-II</b>			
3. Define Relation What are the different types of relations with example	14M	CO2	L2
<b>OR</b>			
4. a) Draw the Hasse Diagram representing the positive divisors of 36	7M	CO2	L4
b) Let f and g be functions from R to R defined by $f(x) = ax + b$ and $g(x) = 1 - x + x^2$ , if $(g \circ f)(x) = 9x^2 - 9x + 3$ , determine a, b.	7M	CO2	L2
<b>UNIT-III</b>			
5. a) Define Group and explain the properties of a group	8M	CO3	L2
b) Show that every cyclic group of order n is isomorphic to the group $\langle \mathbb{Z}_n, + \rangle$	6M	CO3	L3
<b>OR</b>			
6. a) In How many ways can the 26 letters of the alphabet be permuted so that none of the patterns car, dog, pun or bytes occurs	8M	CO3	L3
b) Explain the term Pigeonhole Principle.	6M	CO3	L2
<b>UNIT-IV</b>			
7. a) Find the sequences generated by the following functions: $(1 + 3x)^{-1/3}$	8M	CO4	L2
b) Find the generating functions for the following sequences $1^2, 2^2, 3^2, \dots$	6M	CO4	L2
<b>OR</b>			
8. a) Solve the recurrence relation $3a_{n+1} - 4a_n = 0, n \geq 0, a_0 = 5$ .	8M	CO4	L3
b) Find the sequence generated by the following function $(3+x)^3$	6M	CO4	L3
<b>UNIT-V</b>			
9. a) Define the term Graph and Representation of a Graph.	7M	CO5	L2
b) When it can be said that two graphs G1 and G2 are isomorphic	7M	CO5	L3
<b>OR</b>			
10. Define Spanning Tree and explain Kruskal's algorithm with example.	14M	CO5	L2

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Hall Ticket Number :

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**R-15**

**Code: 5G236**

II B.Tech. I Semester Supplementary Examinations August 2021

**Electrical Engineering and Electronics Engineering**

( Common to CSE & IT )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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**UNIT-I**

1. a) Define the following i) Resistance ii) Inductance iii) Capacitance. Also give the V-I relationship for the above elements.  
b) Formulate the expression for equivalent inductance of two parallel connected inductors.

**OR**

2. State and explain Kirchoff's laws using neat diagrams.

**UNIT-II**

3. a) A 6 pole, lap wound armature has 840 conductors and flux per pole of 0.018wb. Calculate the emf generated when the machine is running at 600rpm.  
b) Explain the operation & principle of dc motors and explains the significance of back emf in dc motors.

**OR**

4. a) Discuss the functions of following parts in a D.C Generator  
(i) Yoke (ii) Commutator (iii) Brushes.  
b) Explain briefly about Three point starter with a neat sketch.

**UNIT-III**

5. a) A 250 KVA, single phase transformer has 98.135 % efficiency at full load and 0.8 lagging p.f. The efficiency at half load and 0.8 lagging p.f. is 97.751 %. Calculate the iron loss and full load copper loss.  
b) Explain brake test on three phase induction motor.

**OR**

6. Define the regulation of an alternator and explain how you will find the regulation by synchronous impedance method.

**UNIT-IV**

7. Explain the operation of Half wave rectifier with relevant diagrams.

**OR**

8. a) Explain the working of N-P-N transistor and mention its input-output characteristics.  
b) Explain in detail about frequency response of CE amplifier.

**UNIT-V**

9. Describe how phase and frequency are measured by using Lissajous figures.

**OR**

10. Explain the principle & theory of dielectric heating with necessary diagrams and list out the industrial application of dielectric heating.

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