

**SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.**

**BCA I Semester-II (2023-24)**

**Discrete Mathematics-II**

**Paper-IV**

**Result of Unit Test held on 01/04/2024 on**

**Unit I and UNIT II**

**Name of the teacher: Dr. Varsha C. Pande**

<b>Sr. No.</b>	<b>Name</b>	<b>Marks out of 30</b>
1	Aditi Nandkumar Vairale	26
2	Anushka Suraj Shende	29
3	Apeksha Jaydeoman Watkar	15
4	Anjali Ramkrushna Jogi	14
5	Arya Kishor Raut	26
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**Signature of the Teacher**



**Head  
Department of Computer Science**



Professor & Head  
Department of Computer Science  
S. S. E. S. Am's Science College,  
Congress Nagar, Nagpur

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Academic Session 2023-2024  
Bachelor of computer Application (BCA) (Semester-I)  
Paper-IV  
DISCRETE MATHEMATICS - II

**UNIT TEST**

**Time: 45 min.]**

**[Maximum Marks: 30**

**UNIT-I**

**QUE. 1. SOLVE ANY THREE**

- 1 Explain inclusion and equality of sets with suitable example. 5
- 2 Let  $X = \{1, 2, 3, 4\}$  and  $R = \{ \langle x, y \rangle \mid x > y \}$ . Draw the Graph of R and also give its matrix. 5
- 3 Write properties of Binary relation in a set. Explain any two with example. 5
- 4 Define following operations on set with Venn diagrams :  
(i) Union (ii) Intersection  
(iii) Set difference (iv) Symmetric difference. 5

**UNIT- II**

**QUE. 2. SOLVE ANY THREE**

- 1 Define the following functions:  
(i) Onto (ii) One-to-One  
(iii) Inverse function (iv) Composite function. 5
- 2 How many different seven person committees can be formed each containing three women from an available set of twenty women and four men from an available set of thirty men? 5
- 3 Prove by Mathematical Induction:  
$$p(n) = 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$
 5
- 4 Backtrack to find an explicit formula for the sequence defined by recurrence relation,  $b_n = 2b_{n-1} + 1$  with initial condition  $b_1 = 7$ . 5



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**Discrete Mathematics-II**

**Paper-IV**

**Result of Unit Test held on 24/04/2024 on**

**Unit III and UNIT IV**

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Sr. No.	Name	Marks out of 30
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DISCRETE MATHEMATICS - II

**UNIT TEST**

**Time: 45 min.]**

**[Maximum Marks: 30**

**UNIT-III**

**QUE. 1. SOLVE ANY THREE**

- |   |   |   |
|---|---|---|
| 1 | Define Isomorphism and Homomorphism. What procedure is used to show that two semigroups are isomorphic? | 5 |
| 2 | Write properties of Binary operations with suitable example.  | 5 |
| 3 | Define product and quotient of group with suitable example.   | 5 |
| 4 | Draw the Hasse Diagram of divisibility on a set for $D_{20}$ .  | 5 |

**UNIT- IV**

**QUE. 2. SOLVE ANY THREE**

- |   |   |   |
|---|---|---|
| 1 | Prove that, if a Group G has a vertex of odd degree, there can be no Euler circuit in G.  | 5 |
| 2 | Define following terms with the help suitable example:<br>(i) Vertex                      (ii) Degree of vertex                      (iii) Edge<br>(iv) Isolated vertex      (v) Adjacent vertex.   | 5 |
| 3 | Define Hamiltonian path and Hamiltonian circuit with suitable example.  | 5 |
| 4 | Let $A = \{v_1, v_2, v_3, v_4, v_5, v_6, v_7, v_8, v_9, v_{10}\}$ and<br>Let $T = \{(v_2, v_3), (v_2, v_1), (v_4, v_5), (v_4, v_6), (v_5, v_8), (v_6, v_7), (v_4, v_2), (v_7, v_9), (v_7, v_{10})\}$<br>Show that T is a rooted Tree and identify the root. | 5 |



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