**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**Set-: I**

**Q.P. Code:**

**23SYCS202302**

**KASABA BAWADA KOLHAPUR-416006**

**(An Autonomous Institute)**

S. Y. B. Tech

**END SEMESTER EXAMINATION, Jan. – 2023**

Course Name: Discrete Mathematics and Structures Course Code:201CSL202

Seat No:

**Day and Date: Wednesday, 18/01/2023**

**Time: 10.00 am-12.00 pm Max. Marks- 50**

***Instructions:***

1. *Question No. 1 is compulsory.*
2. *Figure to the right indicate full marks.*

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| **BT** | | **CO’s** | **Q. No.** |  | **Marks** |
|  | |  | **Q.1** | **All questions are compulsory.** | **20** |
| **3** | | **CO1** | **a1**  **a2** | Obtain PCNF and PDNF for P→(P˄(Q→P))  Demonstrate that R˄(P˅Q) is a valid inference from the premises P˅Q, Q→R, P→M, ~M. | **3**  **3** |
| **3**  **2** | **CO2** | **b1**  **b2** | 1.Given A={2,3,4} B={1,2} C={4,5,6} Find  i. A+B  ii. B-C  iii.A×B  2.Explain the properties of binary relation with example . | **3**  **4** |
| **1**  **2** | | **CO3** | **c1**  **c2** | Define the following with example   1. Algebraic Structure 2. Semigroup   Let G={1,2,3,4} and the operation addition congruence modulo 4 is denoted by +4 prepare composition table and show that set G is Algebraic System. | **2**  **5** |
|  | |  | **Q.2** | **All questions are compulsory.** | **10** |
| **3** | | **CO3** | **a** | Explain what is POSET? Draw the hasse diagram representing the partial order {(a,b) a divides b} on {1,3,5,9,15,45} | **3** |
| **1**  **3** | | **CO3** | **b1**  **b2** | Define the following  i. Complemented Lattice  ii. Boolean Algebra  Find the Lower bounds, Upper bounds, GLB, LUB (if any) for the following set {6,12,60}  C:\Users\Dell\Downloads\WhatsApp Image 2022-12-22 at 11.27.05 PM.jpeg  **OR**  Minimize a following given Boolean function by using K- Map    A̅ B̅ C̅ +A̅ B C̅ + A̅ B C + A B C̅ | **4**  **3** |
|  | |  | **Q.3** | **All questions are compulsory.** | **10** |
| **2** | | **CO4** | **a** | Explain storage representation of the following graph  C:\Users\Dell\Downloads\WhatsApp Image 2022-12-06 at 9.04.39 PM.jpeg | **3** |
| **1**  **2** | | **CO4** | **b1**  **b2** | Define the following terms  i. Mixed Graph  ii. Isomorphic Graph  Explain different representation of the following tree  C:\Users\dypcet\Downloads\WhatsApp Image 2022-12-08 at 9.29.17 PM.jpeg  **OR**  Find the critical path for the following graph  C:\Users\dypcet\Downloads\WhatsApp Image 2022-12-08 at 8.34.16 PM.jpeg | **2**  **5** |
|  | |  | **Q.4** | **Attempt any two out of three questions.** | **10** |
| **3** | | **CO5** | **a** | In a single throw of dice what is the probability of following  1.Getting a 12  2.Getting a total 3 or 5. | **5** |
| **2** | | **b** | Explain rule of product and rule of sum. | **5** |
| **3** | | **C** | A Bag contains 6 red balls and 4 yellow balls. 3 balls are picked at random what is the probability that  1.Atmost 2 are red  2.None is red | **5** |

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