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|  | D.Y.Patil College of Engineering,Akurdi,pune  **Name of the Department: Information Technology**  **Subject Name: Advance discreet and computational Mathematics**  Practice Question Unit – 1  ( Mathematical foundation for Data science) |



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| **Question NO** | **Question Statement** | **Level of mapping and Number** | |
| **CO** | **PO** |
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| **Q.1)** | Prove the equation by using Venn Diagram |  |  |
| 1) |  | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) |  | CO1 |
| 3) |  | CO1 |
| 4) |  | CO1 |
| 5) |  | CO1 |
| 6) |  | CO1 |
| 7) |  | CO1 |
| **Q.2)** | Application of Venn Diagram |  |  |
| 1) | 100 of them 120 engineering student in a college take part in at least one of the activity group discussion debate and quiz, 65 participate in group discussion, 45 participate in debate, 42 participate in quiz, 20 participate in debate and quiz, 25 participate in group discussion and quiz, 15 participate in debate and quiz. Find the number of students, who participate in   1. All the three activities. 2. Exactly one of the activities. | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) | Among 130 students, 60 study mathematics, 51 study physics and 30 study both mathematics and physics. Out of 54 student studying chemistry, 26 study mathematics, 21 study physics and 12 study both mathematics and physics. All the student studying neither mathematics nor physics are studying biology:   1. Find how many are studying biology? 2. How many not studying chemistry are studying mathematics but not physics? 3. How many student are studying neither mathematics nor physics nor chemistry? | CO1 |
| 3) | Out of integers 1 to 1000   1. How many of them are not divisible by 3 nor by 5 nor by 7? 2. How many are not divisible by 5&7 but divisible by 3. | CO1 |
| 4) | Consider a set of integers 1 to 500   1. How many of them are divisible by 3 or by 5 or by 11? 2. How many are divisible by 3&11but not divisible by all 3,5,11. 3. How many are divisible by 3&11but not divisible by 5. | CO1 |
| 5) | It was found that in the first year Computer Science class of 80 students, 50 knew COBOL, 55 knew C & 46 knew PASCAL. It was also known that 37 knew c & COBOL, 28 knew C & PASCAL, 25 knew PASCAL & COBOL and 7 students however knew none of the language.   1. How many knew all three languages? 2. How many knew exactly two languages? 3. How many knew exactly one language? | CO1 |
| 6) | A survey of 70 high school students revealed that 35 like folk music, 15 like classical music and 5 like both. How many of the student surveyed do not like either folk or classical music? | CO1 |
| 7) | In a survey of 60 people it was found that: 25 read Business India, 26 read India Today, 26 read Times of India, 11 read both Business India and India Today, 9 read both Business India and Times of India, 8 read both India Today and Times of India & 8 read none of these.   1. How many read all three? 2. How many read exactly one? | CO1 |
| **Q.3)** | **Determine Whether each of the following Statement formula is Tautology, Contradiction and Contingency** |  |  |
| 1) |  | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) |  | CO1 |
| 3) |  | CO1 |
| 4) |  | CO1 |
| 5) |  | CO1 |
| 6) |  | CO1 |
| 7) |  | CO1 |
| **Q.4)** | **Prove the following Logical equivalence** |  |
| 1) |  | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) |  | CO1 |
| 3) |  | CO1 |
| 4) |  | CO1 |
| 5) |  | CO1 |
| 6) |  | CO1 |
| 7) |  | CO1 |
| **Q.5)** | **Predicate Logic** |  |  |
| 1) | (where D is set of integer)  Using the information Given above write the above sentences in symbolic form   1. Every integer is odd integer 2. Every integer is even or prime 3. The sum of any two integer is odd integer 4. Each integer is either even or odd | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) | Write the following sentences in symbolic form using predicate and quantifiers  (Where D is set of all Students)   1. All Student have taken a course in communication skills 2. There is a girl Student who is also sports person 3. Some Students are intelligent but not hardworking 4. There is a Student who likes Mathematics and Geography | CO1 |
| 3) | Write the following sentences in symbolic form using predicate and quantifiers  (Where D is set of all People)   1. Some men are genius 2. Any one who is Persistence can learn Logic | CO1 |
| 4) | Write the following sentences in symbolic form using predicate and quantifiers  (Where D is set of all things in universe)   1. All birds can fly 2. Not all birds can fly | CO1 |
| 5) | (where D is set of integer)  Using the information Given above write the above sentences in symbolic form   1. At least one integer is even 2. There exist a positive integer that is even 3. If x is even then x is not divisible by 5 4. No even integer is divisible by 5 5. There exist an even integer divisible by5 6. If x is even and x is perfect square then x is divisible by 4 | CO1 |
| **Q.6)** | **Recurrences Relation (Characteristic root)** |  |  |
| 1) | Solve | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) | Solve | CO1 |
| 3) | Solve | CO1 |
| 4) | Solve | CO1 |
| 5) | Solve | CO1 |
| 6) | Solve | CO1 |
| 7) | Solve | CO1 |
| **Q.7)** | **Recurrences Relation (substitution )** | CO1 |  |
| 1) | Solve | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) | Solve | CO1 |
| 3) | Solve | CO1 |
| 4) | Solve | CO1 |
| 5) | Solve | CO1 |
| 6) | Solve | CO1 |
| 7) | Solve | CO1 |
| **Q.8)** | **Master Theorem** |  |  |
| 1) |  | CO1 | P01-3  PO2-3  PO8-1, PO11-1 |
| 2) |  | CO1 |
| 3) |  | CO1 |
| 4) |  | CO1 |
| 5) |  | CO1 |
| 6) |  | CO1 |