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| Hall Ticket No.: |  |  |  |  |  |  |  |  |  |  |

**SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY**

**SRIT R20**

**(AUTONOMOUS)**

II B. Tech II Sem – Semester End Examinations – Regular – July 2022

**DISCRETE MATHEMATICS**

**[R204GA05401]**

**(**Common to CSE, CSD & CSM)

**Time: 3 hours** **Max. Marks: 60**

**PART-A**

(Compulsory Question)

**\*\*\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 |  | | | Answer the following: (5 X 02 = 10 Marks) | |
|  | a) | | | Define predicates. | |
|  | b) | | | Define functions. | |
|  | c) | | | Find the GCD of 826, 1890. | |
|  | d) | | | Define combinations. Give an example. | |
|  | e) | | | How many edges are there in a graph with 10 vertices each of degree 6? | |
| **PART-B**  (Answer all five units, 5 X 10 = 50 Marks) | | | | | |
|  | | | | | |
| **UNIT-1** | | | | | |
| 2 | a) | Explain the law of duality with an example. | | | **[5M]** |
|  | b) | Explain the well - formed formulas with an example. | | | **[5M]** |
| OR | | | | | |
| 3 | Obtain the principal disjunctive normal form of (**¬** P ∧Q) and (P ∧ Q) V (**¬** P ∧ R) V ( Q ∧ R). | | | | **[10M]** |
|  |
| **UNIT-2** | | | | | |
| 4 | Explain relation matrix and digraph with an example. | | | | **[10M]** |
|  |
| OR | | | | | |
| 5 | a) | | Show that functions f(x)=x3 , g(x)= x1/3 for x ∈ R, are inverse of one another. | | **[5M]** |
|  | b) | | Show that f(x, y) = x + y is primitive recursive. | | **[5M]** |
| **UNIT-3** | | | | | |
| 6 | Let G1 and G2 be subgroups of a group G, show that G1∩G2 is also a subgroup of G and Is G1∪G2 is always a subgroup of G. | | | | **[10M]** |
|  |
| OR | | | | | |
| 7 | Explain division theorem. Give an example. | | | | **[10M]** |
|  |
| **UNIT-4** | | | | | |
| 8 | Explain the circular permutations. Give an example. | | | | **[10M]** |
|  |
| OR | | | | | |
| 9 | Explain the multinomial theorem. Give an example. | | | | **[10M]** |
|  |
| **UNIT-5** | | | | | |
| 10 | Explain the matrix representation of graphs with example. | | | | **[10M]** |
|  |
| OR | | | | | |
| 11 | a) | | State and explain four color theorem with example. | | **[5M]** |
|  | b) | | Prove that a connected graph G is Euler if and only if all the vertices of G are even degree. | | **[5M]** |

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