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

SRIT R19

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

II B. Tech I Sem – Semester End Examinations – Supplementary – Jul 2022

DISCRETE MATHEMATICS

[194GA05301]

(Computer Science & Engineering)

Time: 3 hours **Max. Marks: 70**

PART-A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

a) What is well formed formula?
b) Write in brief about the rules of inferences.
c) Define Equivalence relation.
d) What is a composition function?
e) When a group is said to be an abelian group?
f) Define Homomorphism.
g) Write in brief about the principle of inclusion.
h) Define generating function.
i) Define Euler Graph.
j) List different types of graphs.

PART-B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT-1

2 a) Show that the following statement is a tautology. **[5M]**
$(P \wedge (P \rightarrow Q)) \rightarrow Q$

b) Show that $R \Lambda (P \vee Q)$ is a valid conclusion from the premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\neg M$. **[5M]**

(OR)

3 a) Show that the following statements are logically equivalent without using truth table. **[5M]**
$(P \rightarrow Q) \wedge (P \rightarrow R) \leftrightarrow P \rightarrow (Q \wedge R)$

b) Determine the truth value of each of the following statements **[5M]**
i) 6 + 2 = 7 and 4 + 4 = 8.
ii) four is even.
iii) 4 + 3 = 7 and 6 + 2 = 8.

UNIT-2

4 a) Let X = {1, 2, 3, 4, 5, 6, 7} and R= {(x,y)/ x-y is divisible by 3} in X. Show that R is an Equivalence Relation. **[5M]**

b) Draw the Hasse diagram for the poset $(P(S), \subseteq)$, where S={1,2,3,6}. **[5M]**

(OR)

5 If A={2,3}, B={-1,2}and C={a,b} verify that **[10M]**
i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$
ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

UNIT-3

6 Explain in brief about Euler's Theorem with Example? **[10M]**

(OR)

7 a) Let G be a group of order P, where P is a prime. Find all subgroups of G.? **[5M]**

b) Explain in brief about Fermat's theorem? **[5M]**

UNIT-4

8	a)	15 males and 10 females are members are seated in a round table meeting. How many ways they can seated if all the females seated together?	**[5M]**
	b)	Write about sum rule and product rule with an example.	**[5M]**
		(OR)	
9	a)	Eight people enter an elevator at the first floor. The elevator discharges a passenger on each successive floor until it empties on the fifth floor. How Many different ways can this happen?	**[5M]**
	b)	Find the sum of all 4 digit numbers that can be obtained by using the digits 2,3,5 and7(without repetition)?	**[5M]**

UNIT-5

10		State the Krushkal's algorithm for finding Minimal Spanning Tree? Explain it with an Example.	**[10M]**
		(OR)	
11	a)	Write the rules for constructing Hamiltonian paths and cycles.	**[5M]**
	b)	Show that the complete bi-partite graph $K_{3,3}$ is not planar graph.	**[5M]**

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