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

SRIT R19

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

II B. Tech I Sem – Semester End Examinations – Regular – Mar 2021

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) Define Normal form.
b) Write in brief about the rules for predicate calculus.
c) List out the operations on binary sets.
d) What are the properties of binary relations?
e) Define abelian group.
f) Why do we need Partial ordered set?
g) What is pigeon hole principal?
h) Define Generating function.
i) What are the advantages of Prims algorithm?
j) What a given graph is said to be planar?

PART-B

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

UNIT-1

2 a) Find the truth table for the propositional formula $(P \leftrightarrow \sim Q) \leftrightarrow (Q \rightarrow P)$? **[5M]**

b) What is a Well-Formed Formula? What are rules of the Well-Formed Formulas? **[5M]**

(OR)

3 a) Obtain the PCNF of the following formula $(\sim P \rightarrow R) \wedge (Q \leftrightarrow P)$ by using Truth Table. **[5M]**

b) Prove that the following argument is valid? **[5M]**
$p \rightarrow q$, ~(qvr), ~p

UNIT-2

4 a) If A = {1,2,3}, B= {4,5}. Find A X B and B X A? **[5M]**

b) 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]**

(OR)

5 a) Let A = {1, 2, 3, 4}and P = {{1, 2,3},{4}} be a partition of A. Find the equivalence relation determined by P? **[5M]**

b) Draw the Hasse diagram of $(P(S), \leq)$, where P(S) is power set of the set S={a,b,c}? **[5M]**

UNIT-3

6 a) Let that H = {0,2,4} $\subseteq$ Z6, check that <H, +6> is a sub group of <Z6,+6>. **[5M]**

b) Describe in brief about the procedure for testing of primary numbers? **[5M]**

(OR)

7 a) Discuss in brief about Euclidean algorithm. **[5M]**

b) Show that the identity element in a group is unique. **[5M]**

UNIT-4

8	a)	In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?	**[5M]**
	b)	Find the number of positive integers less than are equal to 2076 and divisible by 3 or 4.	**[5M]**
		(OR)	
9	a)	In a birthday party, every person shakes hand with every other person. If there was a total of 28 handshakes in the party, how many persons were present in the party?	**[5M]**
	b)	In how many ways can a committee of 5 teachers and 4 students be selected from 9 teachers and 15 students such that teacher A refuses if student B is in the committee.	**[5M]**

UNIT-5

10	a)	Write the rules for constructing Hamiltonian paths and cycles?	**[5M]**
	b)	Prove that a connected plane graph with 7 vertices and degree(V) = 4 for each vertex V of G must have 8 regions of degree 3 and one region of degree 4?	**[5M]**
		(OR)	
11	a)	Show that a connected graph with n vertices has at least n-1 edges	**[5M]**
	b)	How many edges does a graph have if it has vertices of degree 4,3,3,2,2? Draw such a graph?	**[5M]**

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