Q.P. Code: 18HS0836 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2022

DISCRETE MATHEMATICS

(Common to CSE&CSIT)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	**a**	Define statement	**L1**	**2M**
	b	Define homomorphism	**L1**	**2M**
	c	How many different words can be formed with the letters of the word MISSISSIPPI	**L2**	**2M**
	d	State generating function	**L1**	**2M**
	e	State handshaking theorem	**L1**	**2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	**a**	Construct the truth table for the following formula $\neg(\neg p \vee \neg q)$	**L2**	**5M**
	b	Show that the following set of premises are inconsistent $P \to Q, P \to R, Q \to \neg R, P$	**L2**	**5M**

OR

3		Obtain the principle conjunctive normal form of $(\neg P \to R) \wedge (Q \leftrightarrow P)$	**L2**	**10M**

UNIT-II

4	**a**	Let A= { 1,2,3,4,5,6,7 }.Determine a relation R on A by , aRb $\Leftrightarrow$ 3 divides (a-b), show that R is an equivalence relation ?	**L2**	**5M**
	b	Define and give an examples for Group, Semi group, Subgroup & Abelian group	**L1**	**5M**

OR

5		Let A be a given finite set and P(A) its power set . let □□be the inclusion relation on the elements of P(A). Draw the Hass diagram of (P(A) , □□) for i) A = { a } ii) A ={ a ,b} iii) A = { a, b, c } iv) A = { a, b, c, d }.	**L2**	**10M**

UNIT-III

6	**a**	How many numbers can be formed using the digits 1, 3, 4, 5, 6, 8 and 9 if no repetitions are allowed?	**L2**	**5M**
	b	What is the coefficient of i) $x^3 y^7$ in $(x+y)^{10}$ ii)x^2y^4 in $(x-2y)^6$	**L2**	**5M**

OR

7	**a**	How many different license plates are there that involve 1,2or 3 letters followed by 4 digits?	**L2**	**5M**
	b	Find the minimum number of students in a class to be sure that 4 out of them are born on the same month?	**L2**	**5M**

UNIT-IV

8	**a**	Find the sequence generated by the following generating function $\frac{x^4}{1-x}$	**L2**	**5M**
	b	Solve $a_{n+2} - a_{n+1} - 2a_n = n^2$	**L2**	**5M**

OR

9		Solve $a_n - 4a_{n-1} + 4a_{n-2} = (n+1)^2$ given $a_0=0$, $a_1=1$	**L2**	**10M**

UNIT-V

10	**a**	Explain In degree and out degree of graph. Also explain about the adjacency matrix representation of graphs. Illustrate with an example?	**L1**	**5M**
	b	Give an example of a graph which is Hamiltonian but not Eulerian and vice versa.	**L2**	**5M**
		OR		
11		Explain Depth- First-Search, Breadth-First-Search Algorithm.	**L2**	**10M**

END