Roll No. .....

Y – 3186

M.A./M.Sc. (Fourth Semester) EXAMINATION, May/June-2021

MATHEMATICS

Paper – 411

DISCRETE MATHEMATICAL STRUCTURES

Time : Three Hours

Maximum Marks : 85 *Minimum Pass Marks : 29*

Note—Attempt *all* questions.

Unit-I

1. If R and S be equivalence relations in the set X, then prove that $R \cap S$ is and equivalence relation in X. 17

Unit-II

2. State and prove Distributive Laws. 17

Unit-III

3. Let L be the set of all factors of 12 and let '*l*' be the divisibility relation on L. Show that (L,'*l*') is a lattice. 17

Unit-IV

4. Change the following Boolean function to disjunctive normal form 17

$f(x, y, z) = [x + (x' + y)']. [x + (y' \cdot z')']$.

Unit-V

5. Show by the method of generating functions the recurrence relation 17/20

$$a_r - 6a_{r-1} + 8a_{r-2} = 0, r \geq 2$$

with the boundary conditions $a_0 = 1$ and $a_1 = 4$.