K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)
Semester: **August – November 2020**
In-Semester Examination

Class: SY
Branch: Computer **Semester :III**
Full name of the course: Discrete Mathematics **Course Code:2UCC305**
Duration: 1hr.15 min (attempting questions) +15 min (uploading) **Max. Marks: 30**

Q. No	Questions	Marks
Q1	1. The Cartesian Product B x A is equal to the Cartesian product A x B. Is it True or False? a. True b. False	1
	2. Let C and D be two sets then C – D is equivalent to a. C' ∩ D b. C'∩ D' c. C ∩ D' d. None of the mentioned	1
	3. Let Universal set U is {1, 2, 3, 4, 5, 6, 7, 8}, (Complement of A) A' is {2, 5, 6, 7}, A ∩ B is {1, 3, 4} then the set B' will surely have of which of the element a. 8 b. 7 c. 1 d. 3	1
	4. Relation 'R' is defined on the set of all integers. where (x,y)is in R if and only if xy>=1. So R is ... a. Anti symmetric b. Transitive c. Symmetric d. Both Symmetric and transitive	1
	5. Negation of proposition ∀x P(x) Λ ∃y q(y) is ____ a. ∃x ~p(x) V ∀y ~q(y) b. ∀x ~p(x) V ∀y ~q(y) c. ∃x ~p(x) Λ ∀y ~q(y) d. ∀x ~p(x) Λ ∀y ~q(y)	1
	6. P1: A V ~(B ΛC) → (A V ~B) V ~C Determine the proposition P1 is _____ a. Contingency b. Contradiction c. Tautology	1

	d. None of the above 7. Let A={ ∅,{ ∅}}. Determine whether the following statement/s are not correct. a. ∅ ∈ P(A) b. {{∅}} ∈ A c. ∅ ⊂ A d. {∅} ∈ A 8. (P v Q) ^ (P → R) ^ (Q →S) is equivalent to a. S → R b. S ^ R c. S v R d. All of above 9. A _____ is an ordered collection of objects. a. Relation b. Function c. Set d. Proposition 10. What is the cardinality of the set of odd positive integers less than 10? a. 10 b. 5 c. 3 d. 20	1 1 1 1
Q2	a. Among 50 students in a class, 26 got an A in the first examination and 21 got an A in the second examination. If 17 students did not get an A in either examination, how many students got an A in both examinations? b. If the number of students who got an A in the first examination is equal to that in the second examination, if the total number of students who got an A in exactly one examination is 40 and if 4 students did not get an A in either examination then determine the number of students who got an A in the first examination only, who got an A in the second examination only and who got an A in both the examination?	5M 5M
Q3 (a)	Let A={1,2,3,4,5}. A relation R is defined on A as aRb iff a<b. Compute R^2 and R^∞. **OR** Let A = {1,2,3,4}. Find the transitive closure set by using Warshall's algorithm for the relation R = {(1,1),(1,4),(2,2),(2,3),(3,2),(3,3),(4,1),(4,4)}.	5M 5M
Q.3(b)	Use mathematical induction to show that 1 + 5 + 9 +….+ (4n – 3) = n (2n – 1) **OR** 2+5+8+…..+ (3n – 1) = n(3n + 1)/2	5M