Printed page: 3 Subject Code: ACSE306

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY ,GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

(SEM: III SESSIONAL EXAMINATION –I)(2021-2022)

Subject Name: Discrete Structures

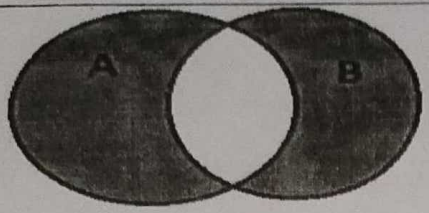
Set-A

Time: 1.15Hours **Max. Marks:30**

General Instructions:

- All questions are compulsory. Answers should be brief and to the point.
- This Question paper consists of 3pages &5questions.
- It comprises of three Sections, A, B, and C. You are to attempt all the sections.
- Section A -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- Section B - Question No-3 is Short answer type questions carrying 5 marks each. You need to attempt any two out of three questions given.
- Section C -Question No. 4 &5are Long answer type (within unit choice) questions carrying 6marks each. You need to attempt any one part *a* or*b*.
- Students are instructed to cross the blank sheets before handing over the answer sheet to the invigilator.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

		SECTION – A	**[8]**	
			(4×1=4)	**CO**
1.	**Attempt all parts**			
	a.	(a,a) ∈R, for every a∈A. This condition is for which of the following relations? a) Reflexive relation b) Symmetric relation c) Equivalence relation d) Transitive relation	**(1)**	CO_1
	b.	The members of the set S = {x | x is the square of an integer and x < 100} is _____ a) {0, 2, 4, 5, 9, 55, 46, 49, 99, 81} b) {1, 4, 9, 16} c) {0, 1, 4, 9, 16, 25, 36, 49, 64, 81} d) {0, 1, 4, 9, 25, 36, 49, 123}	**(1)**	CO_1
	c.	The shaded area of figure is best described by?	**(1)**	CO_1



a) A' (Complement of A)
b) (A ∪ B) – (A ∩ B)
c) A – B
d) B

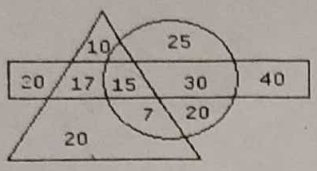
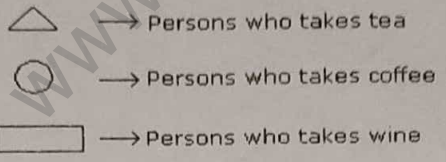
	d.	Let the set be A= {a, b, c, {a,b}} then which of the following is false? a) {a, b} ∈ A b) a ∈ A c) {a} ∈ A d) b, c ∈A	(1)	CO
2.	**Attempt all parts**		(2×2=4)	CO
	a.	Write the set B={3,9,27,81} in set-builder form.	(2)	CO
	b.	Are sets A={1,2,3,4},B={x: x∈ N and 5≤x≤7} disjoint? Why?	(2)	CO

SECTION – B

3.	**Answer any two of the following-**		[2×5=10]	CO
	a.	In a school, there are 30 teachers who teach Mathematics or Physics. Of these, 18 teach Mathematics and 6 teach both Physics and Mathematics. How many teach Physics only?	(5)	CO
	b.	Using warshall's algorithm find the transitive closure of the relation R = {(1,1), (1,2), (2,2), (3,4), (5,3), (5,4)} where {1, 2, 3, 4, 5} ∈ A is_____.	(5)	CO
	c.	The binary relation S=ϕ (emply set) on set A = {1, 2, 3} is whether reflexive , symmetric or transitive?	(5)	CO

SECTION – C

4	**Answer any one of the following-(Any one can be applicative if applicable)**		[2×6=12]	CO
	a.	**Question-**The binary relation R = {(1, 1), (2, 1), (2, 2), (2, 3), (2, 4), (3, 1), (3, 2), (3, 3), (3, 4)} on the set A = { 1, 2, 3, 4} is equivalence relation or not?	(6)	CO
	b.	**Question-**Let A and B be sets and let A^c and B^c denote the complements of the sets A and B. The set (A−B)∪(B−A)∪(A∩B) is equal to?	(6)	CO
5.	**Answer any one of the following-**			

	a.	If A={1,2,3}, B={1,2} R= {(1,1), (1,3), (2,2), (2,3), (3,1)} what will be R^c and what will be R^{-1} ?	(6)	CO1
	b.	Consider the following diagram:   a) How many people like tea and wine? 32 b) How many people like tea only? 30	(6)	CO1