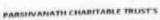


A.P. SHAH INSTITUTE OF TECHNOLOGY

Semester:	Subject : DSGT	Academic Year: 20 92- 20 9.3
	Module No. 2 Relations and	
e.g. A s	set generally of	defined collection ements" or "members lenoted by capital 17, Z.
If & is	an element of eA.	
ex. A = {	x \$ A. 2, y, z y or	$A = \{1, 2, 3\}$
	n of a set -	
		of all prime no.
iii) Set-Builder 80 A is		= $\{x \mid x > 10\}$ that x is greater than 10.
Subject Incharge :	Page No Departs	ment of CSE-Data Science APSIT





Subject Incharge :___

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Department of Computer Science and Engineering Data Science

Semester:
Finite set - A = { 2 2 < 10 }
Infinite set - A = {2e x > 10 }
* set properties -
is Every set A is a subset of the
set 'V' since all the elements of a Lal
set 'U' since all the elements of A belon to 'U', empty set \$ is a subset of A \$ of A c U
ij Every set A is a subset of itself,
and every element of A belongs to set B, then every element of B belongs to set C,
and every element of B belongs to set &
then every element of A belongs to c. A CB and BCC
- then ACC
iv) Tf A CB and BCA
bave the same slaverit
have the same elements that is A = B
if A=B then ACB and BCA
Partitions of set.
Let A be a set. A partition of A is any
set of non-empty subset A1, A2, of A
3 3 3 3 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7

Page No._



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Department of Computer Science and Engineering
Data Science

Semester: 111 Subject: DSGT Acad	demic Year: 2092 - 2023
is A, U A2 U = A	(union)
The subset A; are mutually	disjoint,
that is	(intersection)
$A : \mathbf{n} A = \phi \text{for } i \neq j$	
(mtarexamples -	
(i) Let A = Sa, b, cg	-
then A = 2 a 3 A 2 = 2 b , c 3	2
it A = A, U A2 = { a3 U { bic	1
= \{a,b,c\}	
$A_1 \cup A_2 = A$	
11/ A, MA2 = 203 M 2 b, c3	
$A_1 \cap A_2 = \emptyset$	
(2) Let s = &1,2,3,4,5,6,7,8,9)	Determine.
whether or not each of the following	is a partition
0 5.	
14 \$ \$ 1, 3, 5 } \$ 2, 6 } { 4, 8, 9 } }	
1 2 2 1 , 3, 5 } 2 2 , 4 , 6 , 8 3 5 5 , 7 , 9 3 3	
1117 111,3,5} 82,4,6,8} 27,934	
1少多多多分	
55 5 5 1 2 2 5 2 C 2 5 1 . 0 a 2 3	- 1
$51 = \{1,3,5\}$ $\{2,6\}$ $\{4,8,9\}$ $\{3\}$ $\{4,8,9\}$ $\{5\}$	= 44,8,93
21 = 6112127 35 - 65101 32	- [41017]

Subject Incharge : Page No._



Subject Incharge :_____

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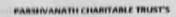
Semester :	nı	subject : DS GT	Academic Year: 20 22 - 20 1.3
- A/-	SI U S2	US3 = {1,3,5}U&	2,630 24,8,93
	S1 U S2	US3 + 5	
		133 = \$1,3,531	
_ H	ence :	s1, s2 and 33	is not a partition
1 2 21	,3,5} 2	2,4,6,8} \$5,7,6	333
	31 = 21	3,59	
	23 = 4		
a> s	1052	J 53 = {1,3,53 }	2 4 6 8 4 5 5 7 6
-		= {1,2,3,4,	5,6,7,8,93
b> 51	N 52 N	53=21,3,5752,4,	6,837 5,7,93
- Heo	ce. Si	,52,53 is not	a partition of s
शि हेश। इ	P .	2,4,6,83 27,93	3
		4,6,84	
	3 = 5-	4	
		3 = \$1,3,5}0{2,4,	6,830 27,93
		= {112,3,9,5,6,	
		= 5	

Page No.



A.P. SHAH INSTITUTE OF TECHNOLOGY

Semester:
b) SIAS2 053 = \$1,3,53 0 22,4,6,83 0 27,93
Hence SI, S2, S3 partitions of set 8.
n) 22533, Se &1,2,3,4,5,6,7,8,33
\$ \$ \$ \$ \$ \$ \frac{3}{3} = \frac{9}{2} \frac{1}{2}, \frac{3}{3}, \frac{1}{3}, \frac{6}{3}, \frac{7}{8}, \frac{9}{3} \frac{3}{3} \] \$ \frac{1}{2} \frac{9}{3} \frac{1}{3} \text{ is a partition of S.}
(2)
Determine whether or not each of the
following is a partition of the set of positive integers.
ib 53 n: n > 53 3 n: n < 533
11 > 250:075} 203 \$ 1,2,3,4,53}
Power Set:
Let A be a set, then the set of all subsets of A is called the power set of A and is denoted by P(A). Power set is an example of set of sets. that is, a set whose elements are themselves one
Power set of A has 2 elements where n is
number of elements in A





Subject Incharge :_

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				n 17		
() Semest	ter: T	Sub	ject: DSG	T	Academic Year	20 22- 2023
6X. r	et $A = 2$	1,2,3}	Deter	nine the	powers	et A.
>	(A) cor	o etvice	f the	following	subset	OF A
	3 813	. 523.	537.21	23, 22,3	3, \$1,33	and
21	1,2,316	or A)				
PC	A) has	23 =	8 eler	ments 3, 1,23, 1,3	6 Va 2 V	TIVE I
P	(A) = 36	3 5,4	\$24 \$3	4 7144 SIA	4 2 37 5	31,2,34
0			1 (- 0) (-	3,0123,013	3, 1 - 1 - 3 1	
6x. 1	et set	A - 50	L.b. C.o	13 Detern	nine the	no (20or
Set	A.	1,-1	101010	rj begoon	mire the	bomer
A DOMESTIC OF THE PARTY OF THE		5 % 5 0	2 5 1 2	502 512	S a L 2	1 - 12
	Sa	d2 8 1	(2, 0)	EC3, 203	12 6 1	29,69,
	50	p 13	16350	13, 50,	43, 90,6	0105,
P	(A) has	4-1	129,0,	d 3, 26, c,	191, 29,	0, (19 1 4
	cis nas	2 -11	e eleme	nts.		acqui-
(3)	a Hermina	.h.				1 3
ex D	a) (pa	The	power	set PCA	of Ada	1,6,69
_ PC	H)= 434	170919	8 b 4 1 d C	3, 29,63,	£6,05, }	9,03,
-		0,633				
_ P(A) 15	a set	0 2	= 8 eler	ments.	
<u> </u>						
4) If	AS Ø,	as H	nen (o	instruct t	he sets f	UP (A)
A ((A)91				1- 1-11-11	
PCA	A) = 29	b. fals	03.50	t. a 2 3		
		A STATE OF THE PARTY OF THE PAR		\$3,203,	5 d a 4 4	
	Anp(A)			+ 3/1 - 3/	C+ 1 cm 3)	
	rur(n,	- 10	3 -		1	
1						

Page No._



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Semester III Subject DS GT Academic Year 2017-3-2013	3
Venn diagram - it is used to represent set diagramatically	
Rectangle: used to repres	- Len
	-
Circle To represent a se	1
ex U = \$1,2,3,4,5,6,7,89	211
$= \begin{array}{cccccccccccccccccccccccccccccccccccc$	
B = { 2,4,6}	
C = 31,2,3,4}	
D = \113, 4, 5, 73	
U 2, 4, 6, 8 1, 3, 5, 7, 8 U	
(2,4,6)	HELE !
(1,3,5,7)	
A	
	- 1
served ser Set 5,6,7,8 2,6,8	7.
IVE ISOU SC	- 1
(1,2,3,4)	7-1
1 1 1 1 1 1 1 1 1	0
L. C.	-



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PARSINANATH CHARITABLE TRUST'S

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Department of Computer Science and Engineering
Data Science

Semester	Subject: DSGT	Academic Year: 2022 - 2023
Examples on	set -	
ex. (1) If A = & a	, b, c3 then	
P(A) = { 9	1, 203, 263, 803,	59 63 19 64
761	(1, 2a. p. c23	11,00,000
·: 1 P(A)1	= 2/41	THE CHIEF PARTY OF
1A1 =	3	
then	[P(A)] = 23 =	8
(2) consider	the following se	H
A = \$ 1	2,3,4,5}	
	1,3,43	
C = 2	4, 5, 6, 7}	
D = 5	4,2,33	
E = 51	, 2, 3, 43	
	1, 53	
	2,3,4,5,6,7,8	9,103
I EA .	IEE, 6¢A	
	we have a e	,
	we have a	1 -0 (1) (1)
BCA		
CAA		E C
C # F,	B = D , D	CB,
141=5	1-1-12-12	
101=	IEI	21000
A = \$ 6	17,8,9,103 C	= \$1,2,3,8,9,10
L	Mi and a second an	

Page No.__



PARTIFICANATH CHARTYARLE TRUST'S

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Department of Computer Science and Engineering Data Science

Semester: JIL Subject: DSGT	Academic Year 20 22 - 202_3
To represent all the single Venn diagram.	above sets in a
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5,7 P
7 € A,D 8 € A,B,C,D	C C
Set Operations -	
Union of set - 1 Union of two or m into a set that includ those sets, i.e. if a then a E A U B.	es all elements of
A 10 is	an element belonge both sets, then it present only once the union set.
AUB	

Subject Incharge :_

Page No.



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A.P. SHAH INSTITUTE OF TECHNOLOGY

	Semester: Mcademic Year, 20 23-20-2-3
	ex A = {1,2,3,4,5}
	9 = 2 2, 4, 6, 8, 103
	AUB = \$112,3,4,516,8,109
	A B
	- Consider
	AUB = BUA
	consider of different sets AI, Az, Az, Az
	The union of these sets is represented as
	D'A: - AI WAL U A3 U UAn
	i=1 OHIOHIOHIO
-	
(2	Intersection of sets -
	Intersection of two or more sets result
	into a set that includes all elements that
	gre present in all the sets.
	ie if a EA and a EB then a EANB
	e.q. A = 21,2,3,4,5}
=	B = { 2, 4, 6, 8, 10}
	ANB = {2,43
3	A (13 (2) 63)
0	Ai = A, MA M MAn
1=1	Subject Incharge : Page No. Department of CSE-Data Science APSIT
-	The state of the s



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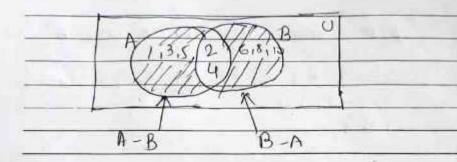
Semester:
3) Complement of set -
The complement of a set is a set that
in the given set.
in the given set. i.e. if a & A then a & A or a & A'
e.g. A= {1,2,3,6} U=\$1,2,3,6,8,9}
$\frac{B = \{3,6,8,9\}}{A = 28,9}$
- V////////////////////////////////////
(3,6)//
- 1/n/1/1/A
) Set différence
Consider two sets A and B. The diff op A - B is a set that includes all elements in
A but not in B.
A-B= {x/xcA and x & B3 = AnB
if A = B + B - A - B = B - A = Ø



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Department of Computer Science and Engineering **Data Science**

Subject: DSCrT Semester 111 Academic Year: 2012-2023



5) Symmetric Difference or Boolean sum Symmetric difference of two sets 1	A
Symmetric difference of two sets 1	4 and B
is the set that contains blements pr	resent
either in A or in B but not in	both sets.
This is called Boolean sum	
1 e. A @ 8 = { 2 (2 E A 00 2 E B) } ar	nd
(z & A N B)	
: A + B = (A-B) U'(B-A)	
= (ANB) U (BNA)	
e.q. A=\$1,2,3,4,59 B= 22,4,6,8,	103
A B = 21,3,5,6,8,10}	
B.	
1//13/2/6,8/19	
1/15//49///	

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