

PARSHVANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering
Data Science

Semester : Subject :	DSGT	Academic Year: 2022-2023
* Monoid: - A group cen identity element Let (A, *) be an a is a binary operation a monoid if the followatisfied. (a*e) = * is a closed of = * is an associa = There is an in	with resulgebraic on on A owing c peration tive ope	pect to op a system, where * (A, *) is called onditions as as a factor of the system
Coylar Coylar	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Examples -		•
(1) (Z, *) is monoid	or not	9
$\Rightarrow Z = \{3, -2, -1, 0,$		
(axe) = (exa)		
consider a = 2		
2*6 = 2	Q	*a=e*2=2
e = 2/2		e= 2/2
[e=1]		[c=]
	N N S S P S S	
so it is monoid	10 = (10 d	
are have to cheel	s for al	gebraic structure
and semigroup.		



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2) Given semigroup is monoid or	no+9 (N, .)
=> check for closure property.	s marinata es C
N= {1,2,3, 00}	(9.16) 62
$ q * b \in N$	Proposed &
$2*3=6$ 6 \in N, 2	&3 EN
- so it is an algebraic struct	
The second secon	O DI V Y
Now check for samigroup	E BEAR
carb)*c = a*(b*c)	AND ALL ASSESSMENT
$\frac{(\alpha + \beta) * c' = (\alpha * (\beta * c))}{(\alpha + \beta) * c'}$	
Q = 2	- 2 1 1 1 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1
b = 3	
$\frac{c=1}{(2*3)*1=2*(3*1)}$	
6*1 = 2*3	10.700
6 = 6	
	- satisfiel
hence it is semigroup as it	04-0-
associativity property!	
Now cheek for identy	
(a*e)=(e*a)=q	
5 * e = 5	ED VIEW
e=5/5 e=5/5	
e=1	
identity property spetisfied hence it	is monoid also
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(3) (R, ÷) is monoid or not)
$R = \{ \text{ set of real no } \}$ = $\{ \dots -3, -\sqrt{2}, -\frac{1}{2}, 0, 1, 4 \}$	15,16,3
First check for dosure proper 9 * b E R 9, b E R 16 ÷ 1 = 16 1 ÷ 16 = 0.	Y. /
$0 \div 16 = 0 \qquad 16 \div 0 = 0$ it is not a of real number	member of set
so it is not algebraic structure so it is not semigroup also not a monoria.	vre
(R^*, \pm)	nembers
$R^* = \text{set of all non-zero real}$ $R^* = \{3, -\sqrt{2}, -1/2, 1, 4/5, 1/5, 1/5, 1/5, 1/5, 1/5, 1/5, 1/5, 1$	16, }
check for closure property ax b \in R 16 \div 1 = 16	
so it is algebraic structure	ne.

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check for associativity proper 9=2, b=3, c=5	ny ·
9=2, 6=3,(2=5	
(a*b) * C= (5 a*(b*c)	0 19 19 1
Q=16 (0xb) x C= 8	6 a * (b * c)
b=1	
C=17(00) prof solo sol	My House
$\frac{C=1}{(2*3)*5} = 2*(3*9)$	5) 14 19
30 = 30	1 = 9
goit is semigroup	
so it is semigroup check for monoid, identity	property
Literature to to a lease with the second	
(axe) = (exa) = e	
Q = 2	
2 * e = 2	2 = 2
*e=212	-2/2
(e 2)	e 2)
so it sapisfies identity for	peny.
so (pt) is monoid.	Participation
23 - 191 EVE T 1871-1871-18	
VESTING SAD OF	STATE HOUSE
	99/10
	DIE