

PARSHVANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering
Data Science

Semester: DSG-T	Academic Year: 2022-2023
An algebraic structure (s semigroup if it follows as	(*) is called a sociative property.
i.e. (a*b)*c = a*(b*c)	₩ a,b,c es-
$ex.(1)(N, +)$ $N = \{1, 2, 3,, \infty\}$	THE SAME CONTRACTOR DESCRIPTION DESCRIPTIO
$\frac{1e}{b=10}$	st check for closure prop atb = 5+10=15. 15 EN
$C = 15$ $ii \neq \text{put values}$ $(a+b)+c = a+(b+c)$	hence 11 13 c.
(5+10)+15=5+(10+1) 15+15=5+25	5)
hence this algebraic st	nutire (N,+)
is a semigroup!	
2) $(z, *)$ $z = \{3, -2, -1, 0, 1, 2\}$	3,3
Q = 10 b = 10	
c = 1	



Subject Incharge :____

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First check for closure property
100 EZ hence it is closed set
so(z,*) is algebraic structure.
So (z, *) is algebraic structure. Now check for associative property
(a*b)*c = a*(b*c)
(10*10)*1 = 10*(10*1)
100 = 100
hence it is a semigroup.
(3) { 2" In is any integer is a semigroup
with multiplication?
25 * 2 = 2 (5+10)
= 215
7 25 6 7
$= 2^{15}$ $= 2^{15} - 6 Z$ it is algebraic structure $0 = 5 b = 10 C = 15$
0=5 b=10 C=15
$2^{5} * (2^{10} * 2^{15}) = (2^{5} * 2^{10}) * 2^{15}$ $2^{5} * 2^{25} = 2^{15} * 2^{15}$
25 * 225 = 215 * 215
it jatisfies associative property.
Hence it is somigroup.

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