Semester : III Subject : DSGT Academic Year: 2022-2023

* Abelian group - or commutative group -

A group $(G, *)$ is said to be abelian if
$(a * b) = (b * a)$
$\forall a, b \in G$.

ex. (1) $(Z, +)$

i) $Z = \{ \ldots, -3, -2, -1, 0, 1, 2, 3, \ldots \}$
$a = 10$
$b = 7$
$a + b = 10 + 7 = 17 \in Z$.
it is algebraic structure

ii)
$a + (b + c) = (a + b) + c$
$10 + (7 + 2) = (10 + 7) + 2$
$19 = 19$
it is semigroup

iii)
$a + e = e + a = a$
$3 + 0 = 0 + 3 = 3$
it is monoid

iv)
$a + b = b + a = e$
$3 + (-3) = (-3) + 3 = 0$
it is group

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v) abelian group or commutative group?

$a+b = b+a$	$a+b = b+a$
$5+2 = 2+5$	$(-2)+3 = 3+(-2)$
$7 = 7$	$1 = 1$

it is a commutative group.

ex. (2)

$(N, \cdot)$