

Subject Incharge:

PARSHVANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering
Data Science

| Semester : | Subject: DSGT Academic Year: 20 22-20 23 |
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| | |
| EX. EX | amples on Multiplication modulo 'P' |
| 1.19 | |
| * UP- | rove that the set $G = \{1, 2, 3, 4, 5, 6\}$ finite Abelian group of order 6 with |
| 13 a | ct to multiplication modulo 7. |
| · OSPE | C) TO VOICE IN PROCESSION OF THE STATE OF TH |
| => com | position Table- |
| | The man and the planting of the sound of the |
| X7 | 1 2 3 4 5 6 |
| <u> </u> | 1 2 3 4 5 6 2x1 mod 7 = 2 |
| 2 | 2 1 6 1 3 1 7 1 7 |
| 3 | 3 6 2 5 1 4 2x3 mod 7 = 16 mod 7 = 1 mod 7 = 1 |
| 4 | |
| 5 | |
| 6 | 16 5 4 3 2 1 XX6 mod 7= 5 |
| S | ilarly we can compute for all the sous. |
| 3)10) | Harris and Carrier |
| 11A LI | the entries in the composition table are |
| THE RESIDENCE OF THE PARTY OF T | ents of Gr. Here G is closed with respect |
| to m | ultiplication modulo 7. (X7) |
| 10 111 | 041,771,000 |
| गंध्र ना | as composition of x 7 is associative los |
| -11/(-1) | re composition of X7 is associative. Let |
| _4,0 | |
| | |
| | |

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| a * (b*c) = (a*b)*c |
| $A \times_7 (b \times_7 c) = (a \times_7 b) \times_7 c.$ |
| $\frac{a \times_7 (b \times_7 c) = (a \times_7 b) \times_7 c}{\text{Let } a = 1, b = 2, c = 3.}$ |
| LANGER AND SERVICE KARLES KALL |
| $-1 \times_7 (2 \times_7 3) = (1 \times_7 2) \times_7 3$ |
| $-1 \times 76 = 12 \times 73$ |
| 6 = 6 |
| hence it is an associative operation! |
| since it is satisfying for all a,b, c & G. |
| and probably and and the same of the same |
| ini > We have I & G. |
| If a is any element of Cr, then by |
| identity property. |
| $\frac{q * e = e * q = a}{1 \times 1 \times 1 \times 1 \times 1}$ |
| $1 \times_{7} 1 = 1 \times_{7} 1 = 1$ $3 \times_{7} 1 = 1 \times_{7} 3 = 3$ |
| $\frac{3}{6}\frac{x_{7}}{1} = \frac{1}{x_{7}}\frac{x_{7}}{6} = 6$ |
| 6 N7 1 = 1 N70 = Oloment. |
| 1 is an identity element. |
| in a sound of the perfect of the sound of th |
| u) By inverse property, 0 + b = e is an identity |
| $\frac{a * b = e}{a * b} = \frac{e}{a} = \frac{e}{a} = \frac{e}{a} = \frac{e}{a}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| $2 \times_7 4 = 1$ $6 \times_7 6 = 1$ |
| 3 x7 5=1 6 17.6 -1 |
| Hence inverses of 1213,4131 |
| 1,9151-1515 |
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| is commutative as the |
| |
| |
| $\frac{\text{table are denH cal.}}{2 \times_7 3 = 3 \times_7 2 2 \times_7 5 = 5 \times_7 2}$ |
| 6 = 6 |
| 4 x 7 5 = 5 x 7 4 |
| 6 = 6 |
| Hence it is commutative. |
| |
| vi) The set has 6 elements hence group |
| (G, X7) is a finite Abelian group of order 6. |
| The state of the s |
| x. (2) |
| Let Zy i.e. G= 20,1,2,33 |
| i) prepare its composition table with respect |
| to (xu,) |
| ii) Is it a group? |
| |
| => Let 4 = {0,1,2,3} |
| composition table - |
| X4 0 1 2 3 |
| 0 0 0 0 0 0 |
| 10123 |
| 20202 |
| 3 0 3 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| and the second of the second o |

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