QN	**S.Y.B.SC.(Mathematics)** **Subject :MTH-232 (A) Algebra** **Question Bank**	**Ans**
1)	Which of the following operations is not binary in $\mathbb{Z}$? (A) addition (B) multiplication (C) subtraction (D) division	D
2)	Let G be a non-empty set. A binary operation $*$ on G is said to be ….. if $a * (b * c) = (a * b) * c$ for all $a, b, c \in G$. (A) associative (B) closure (C) commutative (D) abelian	A
3)	What is the identity element in the group $(\mathbb{Z}, +)$? (A) 0 (B) 1 (C) -1 (D) 2	A
4)	Consider the group $(\mathbb{Q}^{+},*)$ where $a * b = \frac{ab}{3}$ for all $a, b \in \mathbb{Q}^{+}$. What is the identity element in $\mathbb{Q}^{+}$? (A) 0 (B) 1 (C) 2 (D) 3	D
5)	Which of the following is not a group? (A) $(\mathbb{Z} , +)$ (B) $(\mathbb{N} , +)$ (C) $G = \{ 1 , -1 , i , -i \}$ under usual multiplication (D) $G = \mathbb{R} - \{ 1 \}$ under operation $a * b = a + b - ab$ for all $a, b \in G$	B
6)	Which of the following is incorrect? (A) Identity element in a group is unique. (B) Inverse of every element in a group is unique. (C) Every group is abelian. (D) None of the above.	C
7)	In a group $G = \{ 1 , -1 , i , -i \}$ under usual multiplication, $i^{-1} = \ldots\ldots$ (A) 1 (B) -1 (C) i (D) $-i$	D

8)	In the group $(\mathbb{Z}_8', \times_8)$, $\overline{3}^{-1} = \ldots\ldots$ (A) $\overline{1}$ (B) $\overline{3}$ (C) $\overline{5}$ (D) $\overline{7}$	B
9)	In a group G, for $a \in G$, $(a^{-1})^{-1} = \ldots\ldots$ (A) a (B) a^{-1} (C) e, identity in G (D) 1	A
10)	Which of the following is an abelian group? (A) $G = \mathbb{R} - \{1\}$ under operation $a * b = a + b - ab$ for all $a, b \in G$ (B) $G = \{1, -1, i, -i, j, -j, k, -k\}$ the group of quaternions under usual multiplication (C) $G = \{A: A$ is a non-singular matrix of order n over $\mathbb{R}\}$ under usual matrix multiplication (D) $G = \{(a, b): a, b \in \mathbb{R}, a \neq 0\}$ under operation $(a, b) \odot (c, d) = (ac, bc + d)$ for all $(a, b), (c, d) \in G$	A
11)	Which of the following is a non-abelian group? (A) $(2\mathbb{Z}, +)$ (B) $G = \{1, -1, i, -i\}$ under usual multiplication (C) $G = \mathbb{Q} - \{-1\}$ under operation $a * b = a + b + ab$ for all $a, b \in G$ (D) $G = \{(a, b): a, b \in \mathbb{R}, a \neq 0\}$ under operation $(a, b) \odot (c, d) = (ac, bc + d)$ for all $(a, b), (c, d) \in G$	D
12)	Which of the following is a non-abelian group? (A) $(\mathbb{R}, +)$ (B) $(\mathbb{Z}_6, +_6)$ (C) $(\mathbb{Z}_8', \times_8)$ (D) $G = \{A: A$ is a non-singular matrix of order n over $\mathbb{R}\}$ under usual matrix multiplication	D

13)	Which of the following group is finite? (A) $(\mathbb{Z}, +)$ (B) $G = \{1, -1, i, -i\}$ under usual multiplication (C) $G = \mathbb{Q} - \{-1\}$ under operation $a * b = a + b + ab$ for all $a, b \in G$ (D) $(\mathbb{Q}^+, *)$ under the operation $a * b = \frac{ab}{2}$ for all $a, b \in \mathbb{Q}^+$	B
14)	Which of the following group is infinite? (A) $G = \{1, -1, i, -i\}$ under usual multiplication (B) $(\mathbb{Z}_6, +_6)$ (C) $(\mathbb{Z}_8', \times_8)$ (D) $(\mathbb{Q}^+, *)$ under the operation $a * b = \frac{ab}{2}$ for all $a, b \in \mathbb{Q}^+$	D
15)	The number of element present in a finite group G is ..... (A) Order of group (B) Order of element (C) Index of group (D) None of the above	A
16)	The order of the group $(\mathbb{Z}_6, +_6)$ is (A) 2 (B) 3 (C) 5 (D) 6	D
17)	In the group $(\mathbb{Z}, +), (2)^4 =$ ..... (A) 0 (B) 2 (C) 8 (D) 16	C
18)	In the group $(\mathbb{Z}_6, +_6)$, $(\overline{3})^{-4} =$ ...... (A) $\overline{0}$ (B) $\overline{2}$ (C) $\overline{3}$ (D) $\overline{1}$	A
19)	In the group $(\mathbb{Z}_8', \times_8)$, $(\overline{5})^4 =$ ...... (A) $\overline{1}$ (B) $\overline{3}$ (C) $\overline{5}$ (D) $\overline{7}$	A

20)	In the group $G = \{ 1, -1, i, -i \}$ under usual multiplication, order of $i = \ldots\ldots$ (A) 1 (B) 2 (C) 3 (D) 4	D
21)	The number of element in the group $(\mathbb{Z}_8',\ \times_8)$ of order 4 are (A) 2 (B) 3 (C) 4 (D) 0	B
22)	Let G be a group and $a, b, c \in G$. Then $(abc)^{-1} = \ldots\ldots.$ (A) $a^{-1}b^{-1}c^{-1}$ (B) $c^{-1}a^{-1}b^{-1}$ (C) $c^{-1}b^{-1}a^{-1}$ (D) $a^{-1}c^{-1}b^{1}$	C
23)	Let G be a group and $a, b \in G$ such that $ab = ba$. Which of the following is incorrect? (A) $a^k b = ba^k$ for all $k \in \mathbb{N}$ (B) $(ab)^n = a^n b^n$ for all $n \in \mathbb{N}$ (C) $(ab)^{-1} = a^{-1}b^{-1}$ (D) None of the above	D
24)	A group G is called as …… if the number of element in G is finite? (A) abelian (B) finite (C) infinite (D) non-abelian	B
25)	An Abelian group is also known as …… group. (A) finite (B) infinite (C) commutative (D) ordered	C
26)	In any group $G, o(a^{-1}) = \ldots\ldots$ (A) $o(a)$ (B) $o(G)$ (C) $\frac{1}{o(a)}$ (D) $\frac{1}{o(G)}$	A

27)	In the group $(\mathbb{Z},+), o(2) = \ldots..$ (A) 0 (B) 1 (C) 2 (D) infinite	D
28)	How many elements in the group $(\mathbb{Z},+)$ has finite order? (A) 1 (B) 2 (C) 3 (D) infinite	A
29)	If G be a group and $a \in G,\ m,n \in \mathbb{N}$, then $a^m a^n = \ldots\ldots$ (A) a^{mn} (B) a^{m+n} (C) $a^{\frac{m}{n}}$ (D) $a^{(m,\ n)}$	B
30)	Order of the identity element in any group is $\ldots\ldots$ (A) 0 (B) 1 (C) 2 (D) $o(G)$	B
31)	Let G be a group and $a,b \in G,\ m \in \mathbb{N}$. Then $(b^{-1}\, ab)^m = \ldots\ldots$ (A) $b^{-1}a^m b$ (B) $b^{-m}ab^m$ (C) $b^{-1}ab$ (D) e	A
32)	Which of the following is a improper subgroup of a group G? (A) $\{e\}$ (B) G (C) Every subgroup of G (D) None of the above	B
33)	Which of the following is a trivial subgroup of a group G? (A) $\{e\}$ (B) G (C) every subgroup of G (D) None of the above	A

34)	A subgroup H of a group G is called …… if $H \neq G$. (A) trivial (B) improper (C) proper (D) None of the above	C
35)	Which of the following is a subgroup of a group $G = \{ 1, -1, i, -i \}$ under usual multiplication? (A) $\{ 1, \ i \}$ (B) $\{ -1, -i \}$ (C) $\{ \ i, -i \}$ (D) $\{ 1, -1 \}$	D
36)	Which of the following is a not subgroup of the group $(\mathbb{Z}, +)$? (A) The set of all even integers (B) $n\mathbb{Z}$ for any $n \in \mathbb{N}$ (C) The set of all odd integers (D) $\{0\}$	C
37)	Consider the statements: I: Union of two subgroup in a group G is a subgroup of G. II: Intersection of two subgroup in a group G is a subgroup of G (A) Only statement I is correct (B) Only statement II is correct (C) Both the statements are correct (D) None of the above	B

38)	Let H, K be subgroup of a group G. Then $H \cup K$ is a subgroup of G if and only if (A) $H \subseteq K$ (B) $K \subseteq H$ (C) $H \subseteq K\ or\ K \subseteq H$ (D) $H \subseteq K\ and\ K \subseteq H$	C
39)	The necessary and sufficient condition for a non-empty subset H of a group G to be a subgroup is that (A) $a, b \in H$ implies $ab^{-1} \in H$ (B) $a, b \in H$ implies $a + b \in H$ (C) $a \in H$ implies $a^{-1} \in H$ (D) $a, b \in H$ implies $ab \in H$	A
40)	For a dihedral group $D_6, o(D_6) = \ldots\ldots.$ (A) 1 (B) 2 (C) 3 (D) 6	D
41)	Consider the following statements: I: Every cyclic group is abelian. II: Every abelian group is cyclic. (A) Only statement I is correct (B) Only statement II is correct (C) Both the statements are correct (D) None of the above	A
42)	The number of generators for the group $G = \{1, -1, i, -i\}$ under usual multiplication are (A) 1 (B) 2 (C) 3 (D) 0	B

43)	Which of the following group is not cyclic? (A) $G = \{ 1, -1, i, -i \}$ under usual multiplication (B) $(\mathbb{Z}_6, +_6)$ (C) $(\mathbb{Z}_8', \times_8)$ (D) $(\mathbb{Z}, +)$	C
44)	Which of the following group is abelian but not cyclic? (A) $G = \{ 1, -1, i, -i \}$ under usual multiplication (B) $(\mathbb{Z}_6, +_6)$ (C) $(\mathbb{Q}, +)$ (D) $(\mathbb{Z}, +)$	C
45)	The number of proper subgroup of the group $(\mathbb{Z}, +)$ are (A) 1 (B) 2 (C) 5 (D) infinite	D
46)	The number if proper subgroup of the group $(\mathbb{Z}_{12}, +_{12})$ are (A) 1 (B) 2 (C) 5 (D) 6	C
47)	A cyclic group of order 10 has …… number of subgroups. (A) 1 (B) 2 (C) 4 (D) 10	C
48)	Let H be a subgroup of a group G and $a \in G$. Then the set $\{ah : h \in H \}$ is known as (A) left coset of H by a (B) right coset of H by a (C) coset (D) sub-coset	A

49)	Let H be a subgroup of a group G and $a, b \in G$. Which of the following is incorrect? (A) $aH = H$ if $\in H$. (B) Ha and Hb are either equal or disjoint. (C) $Ha = Hb$ implies $ab^{-1} \in H$. (D) None of the above.	D
50)	The number of distinct left cosets of a subgroup $H = \{ 1, -1 \}$ in the group $G = \{ 1, -1, i, -i \}$ under usual multiplication are (A) 1 (B) 2 (C) 3 (D) 4	B
51)	If H is a subgroup of a finite group G, then $o(H) \mid o(G)$. This is the statement of ……. theorem. (A) Euler's (B) Fermat's (C) Lagrange's (D) Cauchy's	C
52)	If $n \in \mathbb{N}$ and $a \in \mathbb{Z}$ such that $(a, n) = 1$, then $a^{\emptyset(n)} = 1\ (mod\ n)$. This is the statement of …… theorem. (A) Euler's (B) Fermat's (C) Lagrange's (D) Cauchy's (B)	A
53)	If p is a prime number and $a \in \mathbb{Z}$ such that $p \nmid a$ then $a^{p-1} = 1\ (mod\ p)$. This is the statement of ……. Theorem. (A) Euler's (B) Fermat's (C) Lagrange's (D) Cauchy's	B
54)	Let G be a finite group and $a \in G$. Then $a^{o(G)} =$ ……. (A) e (B) a (C) a^2 (D) $o(G)$	A
55)	Let $\emptyset(n)$ be an Euler's totient function. Then $\emptyset(10) =$ ……. (A) 1 (B) 2 (C) 4 (D) 9	C
56)	Let $\emptyset(n)$ be an Euler's totient function. Then $\emptyset(17) =$ ……. (A) 1 (B) 2 (C) 16 (D) 7	C
57)	The remainder obtained when 3^{54} divided by 11 is ……. (A) 1 (B) 2 (C) 3 (D) 4	D

58)	The remainder obtained when 15^{27} divided by 8 is ……. (A) 1 (B) 2 (C) 6 (D) 7	D
59)	The remainder obtained when $5^{10} - 3^{10}$ divided by 11 is …… (A) 0 (B) 1 (C) 3 (D) 5	A
60)	The number of cyclic subgroups of a group of order 41 = …… (A) 0 (B) 1 (C) 2 (D) 41	C
61)	A function $f: (G, *) \to (G_1, *')$ is called a group homomorphism if …… (A) $f(a * b) = f(a) * f(b)$ for all $a, b \in G$ (B) $f(a * b) = f(a) *' f(b)$ for all $a, b \in G$ (C) $f(a *' b) = f(a) *' f(b)$ for all $a, b \in G$ (D) $f(a *' b) = f(a) + f(b)$ for all $a, b \in G$	B
62)	If $f: (G, *) \to (G_1, *')$ is a group homomorphism and e, e_1 are identity elements in G and G_1 respectively, then $f(e) =$ ……. (A) e (B) G (C) e_1 (D) 0	C
63)	If $f: (G, *) \to (G_1, *')$ is a group homomorphism and $a \in G$, then $f(a^n) =$ ……. For all $n \in \mathbb{Z}$. (A) e (B) $f(a)^n$ (C) a^n (D) 0	B
64)	If $f: (G, *) \to (G_1, *')$ is a group homomorphism, then the set $\{ x \in G: f(x) = e_1,$ identity in $G_1 \}$ is …… (A) homomorphic image of G (B) kernel of f (C) $f(G)$ (D) Imf	B
65)	Let $G = \{ 1, -1, i, -i \}$ be the group under usual multiplication. If a function $f: (\mathbb{Z}, +) \to (G, \times)$ defined by $f(n) = i^n$ for all $n \in \mathbb{Z}$ is a group homomorphism, then $kerf =$ ……. (A) $\mathbb{Z}$ (B) $\{0\}$ (C) $4\mathbb{Z}$ (D) $\emptyset$	C
66)	If a function $f: (\mathbb{R}, +) \to (\mathbb{R}, +)$ defined by $f(x) = \frac{x}{2}$ for all $x \in \mathbb{R}$ is a group homomorphism, then $kerf =$ ……. (A) $\mathbb{R}$ (B) $\{0\}$ (C) $\mathbb{Z}$ (D) $\emptyset$	B
67)	A function $g: (\mathbb{R}, +) \to (\mathbb{R}, +)$ defined by $g(x) = x + 1$ for all $x \in \mathbb{R}$, is ……. (A) one-one group homomorphism (B) onto group homomorphism (C) not a group homomorphism (D) an isomorphism	C

68)	For $n \in \mathbb{N}, (n\mathbb{Z}, +) \cong$ ……… (A) $(\mathbb{R}, +)$ (B) $(\mathbb{Q}, +)$ (C) $(\mathbb{Z}, +)$ (D) $(\mathbb{Z}_n, +_n)$	C
69)	Every finite cyclic group G of order n is isomorphic to …… (A) $(\mathbb{R}, +)$ (B) $(\mathbb{Q}, +)$ (C) $(\mathbb{Z}, +)$ (D) $(\mathbb{Z}_n, +_n)$	D
70)	Every infinite cyclic group G is isomorphic to …… (A) $(\mathbb{R}, +)$ (B) $(\mathbb{Q}, +)$ (C) $(\mathbb{Z}, +)$ (D) $(\mathbb{Z}_n, +_n)$	C
71)	Consider the following statements: I: Homomorphic image of an abelian group is abelian. II: An isomorphic $f: G \to G$ is known as automorphism. Which of the following is true? (A) Only statement I is correct (B) Only statement II is correct (C) Both the statements are correct (D) None of the above	C
72)	If G is a cyclic group with generator a, then the homomorphic image, $f(G) =$ …….. (A) $< a >$ (B) $< f(a) >$ (C) $\{a\}$ (D) $\{e\}$	B

73)	Which of the following statements is false? (A) $(\mathbb{Z},+) \cong (2\mathbb{Z},+)$ (B) $G \cong (\mathbb{Z}_4,+_4)$ where $G = \{1,-1,i,-i\}$ is a group under usual multiplication (C) $(\mathbb{Q},+) \cong (\mathbb{Q}-\{0\}, \times)$ (D) None of the above	C
74)	Which of the following statements is false? (A) $(\mathbb{Z},+) \cong (3\mathbb{Z},+)$ (B) If $G = \{1,-1,i,-i\}$ is a group under usual multiplication, then$G \cong (\mathbb{Z}_4', \times_8)$ (C) Any two finite cyclic groups of same order are isomorphic. (C) None of the above	B
75)	If $f: G \to G_1$ is a group isomorphism and $a \in G$, then (A) $o(a) < o(f(a))$ (B) $o(a) > o(f(a))$ (C) $o(a) = o(f(a))$ (D) None of the above	C
76)	Consider $(\mathbb{R},+)$, the group of reals under usual addition and $(\mathbb{R}^+, \cdot)$, the group of positive reals under usual multiplication. Then the $f: \mathbb{R} \to \mathbb{R}^+$ defined by ……. Is an isomorphism. (A) $f(x) = 2^x$ for all $x \in \mathbb{R}$ (B) $f(x) = 2x$ for all $x \in \mathbb{R}$ (C) $f(x) = x + 2$ for all $x \in \mathbb{R}$ (D) $f(x) = x$ for all $x \in \mathbb{R}$	A

77)	Let $f: G \to G'$ be a group homomorphism. Consider the following statement: I: G is an abelian group II: $f(G)$ is an abelian group. Which of the following is correct? (A) I implies II only (B) II implies I only (C) I if and only if II (D) Neither I implies II nor II implies I	A
78)	Let $f: G \to G'$ be a group homomorphism. Consider the following statement: I: G is a cyclic group II: $f(G)$ is a cyclic group. Which of the following is correct? (A) I implies II only (B) II implies I only (C) I if and only if II (D) Neither I implies II nor II implies I	A
79)	Let $f: G \to G'$ be a group homomorphism. Consider the following statement: I: G is a finite group II: $f(G)$ is a finite group. Which of the following is correct? (A)I implies II only (B) II implies I only (C) I if and only if II (D) Neither I implies II nor II implies I	A
80)	The number of group homomorphisms from the group $(\mathbb{Z}, +)$ onto itself = ... (A) 0 (B) 1 (C) 2 (D) infinite	D

81)	A ring $(R, +, \cdot)$ is said to be commutative if …….. (A) $a + b = b + a$ for all $a, b \in R$ (B) $a \cdot b = b \cdot a$ for all $a, b \in R$ (C) $a \cdot b = b \cdot a$ for some $a, b \in R$ (D) $a \cdot b = 1$ for all $a, b \in R$	B
82)	Which of the following is not a ring under usual addition and multiplication? (A) $\mathbb{R}$ (B) $\{0\}$ (C) The set of all odd integers (D) $\left\{\frac{p}{q} \in \mathbb{Q}: p, q \in \mathbb{Z} \text{ and } q \text{ is odd integer}\right\}$	C
83)	Which of the following rings is commutative? (A) $(\mathbb{R}, +, \cdot)$ (B) $\left\{\begin{bmatrix} a+ib & c+id \\ -c+id & a-ib \end{bmatrix} : a, b, c, d \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices (C) The set of 2×2 matrices over $\mathbb{Z}$ under usual addition and multiplication of matrices (D) None of the above	A
84)	Which of the following rings is without identity? (A) $(2\mathbb{Z}, +, \cdot)$ (B) $\left\{\begin{bmatrix} a & a & a \\ a & a & a \\ a & a & a \end{bmatrix} : a \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices (C) $\left\{\frac{p}{q} \in \mathbb{Q}: p, q \in \mathbb{Z} \text{ and } q \text{ is odd integer}\right\}$ under usual addition and multiplication (D) None of the above	A

85)	Which of the following rings is non-commutative? (A) $(2\mathbb{Z}, +, \cdot)$ (B) $\left\{\begin{bmatrix} a & a & a \\ a & a & a \\ a & a & a \end{bmatrix} : a \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices (C) The set of 2×2 matrices over $\mathbb{Z}$ under usual addition and multiplication of matrices (D) None of the above	C
86)	Which of the following rings is non-commutative? (A) $(\mathbb{Q}, +, \cdot)$ (B) $\left\{\begin{bmatrix} a & a & a \\ a & a & a \\ a & a & a \end{bmatrix} : a \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices (C) $\left\{\begin{bmatrix} a+ib & c+id \\ -c+id & a-ib \end{bmatrix} : a, b, c, d \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices (D) None of the above	C
87)	The identity (unity) element in the ring $\left\{\begin{bmatrix} a & a & a \\ a & a & a \\ a & a & a \end{bmatrix} : a \in \mathbb{R}\right\}$ under usual addition and multiplication of matrices is …… (A) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \end{bmatrix}$ (D) 1	C
88)	The identity (unity) element in the ring $(\mathbb{Z}, \oplus, \odot)$ is ……, where $a \oplus b = a + b - 1$ and $a \odot b = a + b - ab$ for all $a, b \in \mathbb{Z}$. (A) 0 (B) 1 (C) 2 (D) 3	A

89)	Let $(R, +, \cdot)$ be a ring with identity 1. Which of the following statement is false? (A) $a \cdot 0 = 0$ (B) $(-a)b = a(-b)$ (C) $c(a-b) = ac - bc$ (D) $(-1)(-1) = 1$	C
90)	The number of units in the ring $(\mathbb{Z}_6, +_6, \times_6)$ are (A) 2 (B) 3 (C) 5 (D) 0	A
91)	The system $(\mathbb{Z}_6, +_6, \times_6)$ is ……. (A) not a ring (B) ring but not an integral domain (C) an integral domain but not a field (D) field	B
92)	In the ring $(\mathbb{Z}_7, +_7, \times_7)$, $\overline{3} \times_7 (-\overline{4}) =$ ……. (A) $\overline{0}$ (B) $\overline{2}$ (C) $\overline{1}$ (D) $-\overline{2}$	B
93)	The multiplicative inverse of $1 + i$ in the ring $\mathbb{Z}[i]$ is (A) 1 (B) i (C) $1 - i$ (D) None of the above	D
94)	The number of zero divisors in the ring $(\mathbb{Z}_6, +_6, \times_6)$ are (A) 2 (B) 3 (C) 5 (D) 0	B
95)	A commutative ring R without zero divisors is called as ……. (A) an integral domain (B) a field (C) a division ring (D) a Boolean ring	A
96)	For $n > 1$, a ring $(\mathbb{Z}_n, +_n, \times_n)$ is an integral domain if and only if (A) n is odd (B) n is even (C) n is prime (D) n is composite number	C

97)	Which of the following is not a field? (A) $(\mathbb{C}, +, \cdot)$ (B) $(\mathbb{R}, +, \cdot)$ (C) $(\mathbb{Q}, +, \cdot)$ (D) $(2\mathbb{Z}, +, \cdot)$	D
98)	Which of the following is incorrect? (A) Every field is an integral domain. (B) Every integral domain is a field. (C) Every finite integral domain is a field. (D) Every field is a division ring.	B
99)	Which of the following rings is a Boolean ring? (A) $(\mathbb{C}, +, \cdot)$ (B) $(\mathbb{R}, +, \cdot)$ (C) $(\mathbb{Z}, +, \cdot)$ (D) $(\mathbb{Z}_2, +_2, \times_2)$	D
100)	If R is a Boolean ring, then $a^3 =$ ……. for all $a \in R$ (A) 0 (B) 1 (C) a (D) a^{-1}	C