SOLVED/ KEY- MATHEMATICS -6 PTB SH M TARIQ RAFIQ (GOHAR PUBLISHERS LHR PK)

CONTENTS

Exercise 1.1

Q.1. Which of the following statement is a set or not?

i. The five provinces of Pakistan.

Ans. Yes, This is a set.

ii. The difficult questions of a test.

Ans. No, This is not a set.

iii. The geometrical instruments.

Ans. Yes, This is a set.

iv. The naughty boys of the street.

Ans. No, This is not a set.

v. The capital letter of English alphabet.

Ans. Yes, This is a set.

vi. The players of Pakistan cricket team.

Ans. Yes, This is a set

vii. The sharp boys of a school.

Ans. No, This is not a set.

viii. The natural numbers less than 50.

Ans. Yes, this is a set.

ix. The whole number less than 9.

Ans. Yes, This is a set.

Q.2. If, A = {a, e, i, o, u} and B = {a, b, ç, ...z} then which of the following statements are true or false.

i. $a \in A$ True

iii. $A = \{-2, -1, 0, 1\}, B = \{3, 5, 7, 8\}$

Ans. A and B are equivalent sets.

iv. $A = \{0, 1, 2, 3, 4\}$, $B = \{1, 2, 3, 4, 5\}$

Ans. A and B are equivalent sets.

v. $A = \{a, e, i, o, u\}, B = \{l, m, n, o\}$

Ans. A and B are non-equivalent sets.

vi. **A = The set of 4 natural numbers**

B = The set of 3 wild animals.

Ans. A and B are non-equivalent sets.

vii. **A = The set of 5 rivers of Punjab**

B = The set of the colours in Pakistan's flag.

Ans. A and B are non-equivalent sets.

Q.4. Which of the following pairs of sets are equal sets.

i. $A = \{a, b, c, d, e\}, B = \{b, a, e, d, c\}$

Ans. A and B are equal sets.

ii. $A = \{1, 2, 3, 4, 5\}, B = \{1+0, 1+1, 1+2, 1+3, 1+4\}$

Ans. A and B are equal sets.

iii. $A = \{0, 1, 2, 3, 4\}, B = \{6-2, 5-1, 4-2, 3-1, 2-2\}$

Ans. A and B are not equal sets.

iv. **A = The set of even numbers less than 9.**

$B = \{0, 2, 4, 6, 8\}$

Ans. A and B are equal sets.

Q,5. If $A = \{a, b, c\}, B = \{b, c, d\}, C = \{c, d, e\}$ and $D = \{a, b, c, d\}$ which of the following statement are true?

i. $A \subset B$ **Ans.** False

ii. $B \subset D$ **Ans.** True

ii. **The set of English alphabets between u and v.**

Ans. It is an empty set.

iii. **The set of vowels others than a and o.**

Ans. It is not an empty set.

iv. **The set of natural numbers less than 1.**

Ans. It is an empty set.

v. **The set of even numbers which are called odd numbers.**

Ans. It is an empty set.

Q.2. Separate the finite and infinite set from the following.

A = { letters of the word "halla gulla"}

B = The set of the natural numbers

C = {number of days in a year}

D = { Islamic months}

E = {3, 6, 9, ...}

F = {c, f, I, m, o, r, u}

$G = \left\{\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \ldots\right\}$

Ans. A, C, D and F are finite sets. B, E and G are infinite sets,

Q.3. Find that the following pairs of sets are equivalent or non-equivalent.

i. A = {1, 2}, B= {1, 3, 7}

Ans. A and B are non-equivalent sets.

ii. A = {a, b}, B={x, y}

Ans. A and B are equivalent sets.

Exercise 1.3

Q.1. Which of the following set is an empty set?

i. The set of the whole numbers less than 1.

Ans. It is not an empty set.

C = The set of 4 domestic animals.

Ans. {Buffalo, Cow, Horse, Donkey}

D = The set of 5 birds.

Ans. {Pigeon, Sparrow, Eagle, Crow, Hen}

E = The set of 3 prime ministers of Pakistan

Ans. {Liaqat Ali Khan, Benazir Bhutto, Yousaf Raza Gillani}

F = The set of 5 famous cities of Pakistan.

Ans. {Islamabad, Karachi, Lahore, Quetta, Peshawar}

G = The set of letters of the word "banana".

Ans. {It is not set because the members of the set {b,a,n} are not distinct.

I = The set of vowels of the words "naughty".

Ans. {a, u}

J = The set of the years greater than 2006 and less than 2009.

Ans. {2007, 2008}

K = The set of 3 bakery items.

Ans. {Pizza, Cake, Biscuits}

Exercise 1.2

Q.1. Write the following sets into descriptive form.

A= {1, 2, 3, 4, 5, 6}

Ans. The set of first six natural numbers.

B = {0, 1, 2, ..., 99}

Ans. The set of first hundred whole numbers.

C = {Cricket, Football, Hockey, Tennis}

Ans. The set of four games

E = {2, 4, 6, ...}

Ans. The set of even numbers.

F = {Potato, ladyfingers, carrot, brinjal}

Ans. The set of four vegetables.

N = {1, 2, 3, ...}

Ans. The set of natural numbers.

O = {1, 3, 5, ...}

Ans. The set of odd numbers

W = {0, 1, 2, 3, ...}

Ans. The set of whole numbers.

X = {father, mother, brother, sister}

Ans. The set of family members

Q.2. Write the following sets into tabular forms.

A = The set of names of 3 boys whose names start with letter "B".

Ans. {Benjamin, Burhan, Badar}

B = The set of names of 3 girls whose names start with letter "I".

Ans. {Iram, Insha, Iqra}

Sol.

C, D, E and not set because their members are not distinct. H, I, L are not sets because their members are not well-defined. A, B,F, G, J, K, more

Q.6. List the elements of following sets.

i. The set of five countries.

Ans. {Pakistan, Austrailia, SirLanka, England, India}

ii. The set of the three games.

Ans. {Cricket, Tennis, Football}

iii. The set of first ten natural numbers.

Ans. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

iv. The set of first eight even numbers.

Ans. {2, 4, 6, 8, 10, 12, 14, 16}

v. The set of vowels.

Ans. {a, e, i, o, u}

vi. The set of last four months.

Ans. {September, October, November, December}

vii. The set of seven days of the week.

Ans. {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday}

viii. The set of the colours of Pakistani flag.

Ans. {Green, White}

ix. The set of five rivers of the Punjab.

Ans. {River, Chenab, Sutlej, Jhelum, Indus}

x. The set of three Islamic months.

Ans. {Rajab, Shaaban, Ramadan}

ii. Lahore is the number of set P.

Ans. Lahore $\in$ P

iii. 1 is not an element of the set E.

Ans. $1 \notin E$

iv. Sindh does not belong to the set B.

Ans. Sindh $\notin$ B

v. Potato is an elements of set V.

Ans. Potato $\in$ V

vi. 0 belongs to the sets A

Ans. $0 \in$

vii. c is not an elements of the set C.

Ans. $c \notin C$

viii. Mango is not the member of the set F

Ans. Mango $\notin$ F

ix. 5 is an element of the set N.

Ans. $5 \in N$

x. 4 is not an element of the set O.

Ans. $4 \notin 0$

Q.5. Which of the following collection are not sets and why?

A = {b, a, n, k}, B = {2, 4, 6, 8}

C = {0, 1, 2, 0} D = {k, i, *l*, *l*, e, r}

E = {*l*, e, g, a, *l*} F = {9, 3, 5, 1}

G = The set of story books.

H = The set of beautiful birds.

I = The set of rich people.

J = The set of students in 7^{th} class.

K = The set of fish in the river Ravi.

L = The set of bad students in class

M = The set of wooden chairs.

ii.	$b \in A$	**False**
iii.	$d \notin A$	**True**
iv.	$c \notin B$	**False**
v.	$i \in B$	**True**
vi.	$i \in A$	**True**
vii.	$f \in A$	**False**
viii.	$v \in A$	**False**
ix.	$x \notin A$	**True**
x.	$z \in B$	**True**
xi.	$m \notin B$	**False**
xii.	$a \in B$	**True**

Q.3. Fill in the blanks by using either of the symbols $\in$ and $\notin$.

i. 1 $\notin$ (2,3)

ii. b $\in$ (a, b, c)

iii. i $\in$ the set of vowels

iv. Snake $\notin$ the set of pets.

v. 15 $\in$ the set of counting numbers.

vi. 0 $\in$ the set of whole numbers.

vii. Goal keeper $\notin$ the set of cricket team.

viii. B $\notin$ the set of small letters of English

iii.	$C \subset D$	**Ans.** False
iv.	$A \subset D$	**Ans.** True
v.	$B \subset C$	**Ans.** False
vi.	$C \subset A$	**Ans.** False

Q.3. Write the following sets into tabular forms.

i. The set of five even numbers.

Ans. {2, 4, 6, 8, 10}

ii. The set of numbers less than 23 and greater than 17.

Ans. {18, 19, 20, 21, 22}

iii. The set of letters of the word ORANGE.

Ans. {O, R, A, N, G, E}

iv. The set of whole number less than 5.

Ans. {0, 1, 2, 3, 4}

Q.4. Separate finite, infinite and empty sets.

i. A = The set of rivers in Pakistan

Ans. A is finite

ii. B = Set of all natural numbers.

Ans. B is infinite.

iii. C = The Set of no. of people on moon.

Ans. C is an empty set.

Q.5. Separate equivalent and non-equivalent pair of sets.

i. A = {1, 3, 5}, B = {2, 4, 6}

ii. C = {k, i, n g}, D = {a, *l*, m}

Review Exercise 1

Q.1. List the elements of following sets.

i. **The set of first four months.**

Ans. {January, February, March, April}

ii. **The set of last six capital letters.**

Ans. {U, V, W, X, Y, Z}

iii. **The set of five odd numbers.**

Ans. {1, 3, 5, 7, 9}

iv. **The set of four colours.**

Ans. {Green, Blue, Red, White}

v. **The set of three planets in solar system.**

Ans. {Venus, Earth, Mass}

Q.2. Write the reason why following collections are not sets.

i. **{1, 1, 2, 2, 3, 3}**

Ans. Because members are not distinct.

ii. **{b, o, o, k}**

Ans. Because members are not distinct.

iii. {Δ, O, Δ, }

Ans. Because members are not distinct.

Q.6. Fill in the blanks in following pairs of sets to make them equal.

i. $A = \{e, a, r, t\ h\}$, $B = \{t, \_\_\_\_, r, h, \_\_\_\_\}$

ii. $A = \{0, 2, 4\}$, $B = \{\_\_\_\_, \_\_\_\_, 0\}$

iii. $A = \{\text{apple, mango, orange}\}$

$B = \{\text{orange}, \_\_\_\_, \_\_\_\_\}$

Sol.

i. $A = \{e, a, r, t\ h\}$, $B = \{t, e, r, h, a\}$

ii. $A = \{0, 2, 4\}$, $B = \{2, 4, 0\}$

iii. $A = \{\text{apple, mango, orange}\}$

$B = \{\text{orange, apple, mango}\}$

Objective Exercise

1. Answer the following questions.

i. Define a set.

Ans. A collection of distinct and well defined objects is called a set.

ii. What is meant by the symbol $\in$?

Ans. The symbol '$\in$' means is an element of 'or' belongs to.

iii. Name two forms for describing a set.

Ans. i. Tabular form

ii. Descriptive form

iv. What is meant by word distinct in a set?

Ans. It means an object appears only once and does not repeat.

v. If X = {a, b, c} and Y = {c, a, b} are these sets equal or not?

Ans. Yes, they are equal.

Q.2. Fill in the blank.

i. One-to-one correspondence can not be established between_____ sets.

ii. _____means a specific property of an object that enable it to be an element of a set or not.

iii. The symbol _____ means does not belong to the set.

iv. _____ set is also known as null set.

v. The symbol $\leftrightarrow$ is used for two _____ sets.

Answer:

i. non-equivalent ii. well defined
iii. $\in$ iv. empty set
v. non-equivalent

Q.3. Tick (✓) the correct answer.

i. To represent to equal sets, we use the symbol.

a. $\leftrightarrow$ b. $\subset$ c. $\subseteq$ d. =

ii. To write an empty set, we use the symbol

a. $\in$ b. $\subseteq$ c. ϕ d. $\leftrightarrow$

iii. If A = set of vowels, then

a. $i \notin A$ b. $c \in A$ c. $u \in A$ d. $a \notin A$

iv. If A = {1, 2, 3} and B = {0, 1, 2, 3, 4}, then

a. $A \subset B$ b. $A = B$ c. $A \subseteq B$ d. $A \leftrightarrow B$

v. {11} is known as

a. null set b. subset