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Sets

Q1. Find whether the following collections make a set or not. Write Yes or No as answer.

a. The collection of all the difficult questions in an assignment _____

b. The collection of all the girls in your class _____

c. The collection of all integers between -2 and 2. _____

d. The collection of all beautiful flowers in the garden. _____

Q2. If N is the set of all the natural numbers, then choose which of the following is correct:

a. $0 \in N$

b. $2 \in N$

c. $N \in 3$

Q3. Write each of the following in roster form:

a. W = set of all factors of 24

_____

b. L = {x : x is a letter in the word 'HEIGHT'}

_____

Q4. Tick the correct set builder form for each of the following sets:

a. $J = \left\{\frac{1}{1}, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}\right\}$

i. $J = \{x : x = \frac{1}{n}, n \in N \text{ and } n < 7\}$

ii. $J = \{x : x = \frac{1}{n}\ n \in Z \text{ and } n < 7\}$

iii. $J = \{x : x = \frac{1}{n}\ n \in N \text{ and } n < 6\}$

b. K = {4, 8, 12, 16, 20}

i. K = {x : x = 4n, n ∈ Z and n ≤ 5}

ii. K = {x : x = n, n ∈ N and n ≤ 20}

iii. K = {x : x = 4n, n ∈ N and n ≤ 5}

Q5. Write the following sets in descriptive form:

a. V = {a, e, i, o, u}

_____

b. M = {Tuesday, Thursday}

_____

Q6. Match the following sets with their type:

Set	Type of set
A set of all natural numbers less than zero	Finite Set
A set of all even prime numbers	Empty Set
A set of prime numbers less than 10	Infinite Set
A set of all prime numbers	Singleton Set

Q7. Suggest a universal set for the following sets:

A = {Set of vowels in the word 'AIR'}

B = {Set of vowels in the word 'AEROPLANE'}

Answer: U = _____

Q8. State true or false:

a. Set of all people in India is a finite set. _____

b. If set A represents {birds with feathers} and set B represents {Birds that can fly} then Set A and Set B are a pair of disjoint sets. _____

c. If A and B are two sets such that n(A) = n(B), then A = B. _____

d. A pair of sets can have more than one universal set. _____

Q9. If two sets P and Q are equivalent, they may or may not be equal.

Suggest an example to prove the above statement by filling in the blanks.

Answer:

P = {_____}

Q= {_____}

n(P) = _____

n (Q) = _____

Is P ↔ Q? _____ (Yes/ No)

Is P = Q? _____ , because _____

Q10. Write the cardinal number of the following sets:

a. P = {Vertices of a triangle} : _____

b. A = {x : x is a vowel in the word POLYGON} : _____

c. H = {x : x is the name of a month} : _____

d. Q = {Sides of a hexagon} : _____

Answers

1. a. No; b. Yes; c. Yes; d. No

2. (b)

3. a. W = {1, 2, 3, 4, 6, 8, 12, 24}

b. L = {H, E, I, G, T}

4. a. (i); b. (iii)

5. a. V = {Vowels in the English alphabet}

b. M = {Days of the week beginning with the letter T}

6.

Set	Type of set
A set of all natural numbers less than zero	Empty Set
A set of all even prime numbers	Singleton Set
A set of prime numbers less than 10	Finite Set
A set of all prime numbers	Infinite Set

7. U = {a, e, i, o, u}

8. a. True; b. False; c. False; d. True

9. P = {1, 2, 3}

Q = {4, 5, 6}

n(P) = 3; n(Q) = 3

Is P $\leftrightarrow$ Q? Yes

Is P = Q? No, because elements in both the sets are different.

10. a. 3; b. 1; c. 12; d. 6