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**Work sheet -2**

**SET THEORY**

**VSAQ (2 marks)**

1. Fill in the blanks:

If A = {1, 3, 5, 7, 9} and B = {2, 3, 5, 7, 11}, then A B is \_\_\_\_\_\_\_\_.

2. Fill in the blanks:

A set, consisting of a single element, is called a \_\_\_\_\_\_\_\_.

3. List all the elements of set {x : x is a month of a year not having 31 days}.

4. State whether the statement is true or false: {a, e, i, o, u) and {a, b, c, d} are disjoint

sets.

5. If A = {3, 5, 7, 9, 11} , B = {7, 9, 11, 13}, C = {11, 13, 15} and D = {15, 17} find: A ∩ C.

6. Describe {x R: x > x) set in Roster form.

7. Write the set of all natural numbers x such that 4x + 9 < 50 in roster form.

8. State whether each of the following sets is finite or infinite: The set of circles passing

through the origin (0, 0).

9. If A and B are finite sets such that n(A) = m1 and n(B) = m2, then find the least and

greatest values of n(A U B).

10. The Given statement is true or false: {2,3, 4, 5} and {3, 6} are disjoint sets.

**SAQ** **( 3 marks)**

1. Fill in the blanks:

The set of vowels in the word "MATHEMATICS" in the roster form can be written as

2. Make correct statements by filling in the symbols or in the blank space: {x : x is a

circle in the plane}.......{x : x is a circle in the same plane with radius 1 unit}

3. The pairs of set is disjoint: {x : x is an even integer} and {x : x is an odd integer}.Prove.

4. Write {x : x R, -12 ≤ x ≤ -10} , in the form of interval. Also, find the length of the

interval and represent it on the number line.

5. In a group of 50 persons, 14 drink tea but not coffee and 30 drink tea. Find:

i. how many drink tea and coffee both

ii. how many drink coffee but not tea.

6. If S and T are two sets such that S has 21 elements T has 32 elements and S ∩ T has 11

elements. How many elements S U T has?

7. Show that A ∩ B' = A - B.

8. Given the set A = {1, 3, 5}, B = {2, 4, 6} and C = {0, 2, 4, 6, 8}. {0, 1, 2, 3, 4, 5, 6} can it be

considered as universal set(s) for all the three sets A, B and C?

**LAQ** **( 5 marks)**

1. In a survey of 25 students, it was found that 15 had taken Mathematics, 12 had taken

Physics and 11 had taken Chemistry, 5 had taken Mathematics and Chemistry, 9 had

taken Mathematics and Physics, 4 had taken Physics and Chemistry and 3 had taken

all the three subjects. Find the number of students that had taken (i) only Chemistry.

(ii) only Mathematics. (iii) only Physics. (iv) Physics and Chemistry but not

Mathematics. (v) Mathematics and Physics but not Chemistry, (vi) only one of the

subjects. (vii) at least one of the three subjects. (viii) none of the subjects.

2. A college awarded 38 medals in Football, 15 in Basketball and 20 in Cricket. If these

medals went to a total of 58 men and only three men got medals in all three sports,

then how many received medals in exactly two of the three sports.

3. In a group of 50 persons, 14 drink tea but not coffee and 30 drink tea. Find:

i. how many drink tea and coffee both

ii. how many drink coffee but not tea.

4. In a town of 10,000 families it was found that 40% families buys newspaper A , 20%

buy newspaper B , and 10% families buy newspaper C , 5% families buy A and B , 3%

buy B and C and 4% buy A and C . If 2% buy all the three newspapers , then number

of families which buy A only is

5. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read

newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read

both T and I, 3 read all three newspapers.

Find: the number of people who read at least one of the newspaper.

6. If A class has 175 students . The following data shows the number of students offering

one or more subjects. Mathematics 100 ; Physics 70 ; Chemistry 40 ; Mathematics and

Physics 30 ; Mathematics and Chemistry 28 ; Physics and Chemistry 23 ; Mathematics

Physics and Chemistry 18 . How many students have offered Mathematics alone?

7. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read

newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read

both T and I, 3 read all three newspapers.

Find: the number of people who read at least one of the newspaper.

8. In a group of 100 people, 65 like to play Cricket, 40 like to play Tennis and 55 like to

play Volleyball. All of them like to play at least one of the three games. If 25 like to

play both Cricket and Tennis, 24 like to play both Tennis and Volleyball and 22 like to

play both Cricket and Volleyball, then

i. how many like to play all the three games?

ii. how many like to play Cricket only?

iii. how many like to play Tennis only?

Represent the above information in a Venn diagram.

**CASE STUDY** **( 4 marks each)**

1. In a library, 25 students read physics, chemistry and mathematics books. It was found that 15

students read mathematics, 12 students read physics while 11 students read chemistry. 5

students read both mathematics and chemistry, 9 students read physics and mathematics. 4

students read physics and chemistry and 3 students read all three subject books.

Based on the above information, answer the

following questions.

(i) The number of students who reading only chemistry is

(a) 5 (b) 4

(c) 2 (d) 1

(ii) The number of students who reading only mathematics is

(a) 4 (b) 3

(c) 5 (d) 11

(iii) The number of students who reading only one of the subjects is

(a) 5 (b) 8

(c) 11 (d) 6

2. In a company, 100 employees offered to do a work. In out of them, 10 employees offered

ground floor only, 15 employees offered first floor only, 10 employees offered second floor only,

30employees offered second floor and ground floor to work, 25 employees offered first and

second floor, 15 employees offered ground and first floor, 60 employees offered second floor.

Based on the above information, answer the

following questions:

Based on the above information answer the

following questions

(i) The number of employees who offered all three floors.

(a) 5 (b) 3

(c) 4 (d) 6

(ii) The number of employees who offered ground floor.

(a) 50 (b) 60

(c) 65 (d) 70

(iii) The number of employees who offered first floor.

(a) 40 (b) 45

(c) 50 (d) 55

(iv) The number of employees who offered ground and first floor but not second floor.

(a) 10 (b) 15

(c) 20 (d) 25

(v) The number of employees who did not offer any of the above three floors.

(a) 15 (b) 10

(c) 5 (d) 0

3. A class teacher Mamta Sharma of class XI write three sets A, B and C are such that

A = {1, 3, 5,7, 9}, B = {2, 4, 6, 8} and C = {2, 3, 5, 7, 11}.

Answer the following questions which are based on information

(i) Find A ∩ B.

(a) {3, 5, 7} (b) φ

(c) {1, 5, 7} (d) {2, 5, 7}

(ii) Find A ∩ C

(a) {3, 5, 7} (b) φ

(c) {1, 5, 7} (d) {3, 4, 7}

(iii) Which of the following is correct for two sets A and B to be disjoint?

(a) A ∩ B = φ (b) A ∩ B ≠φ

(c) A∪B = φ (d) A∪B ≠φ

(iv) Which of the following is correct for two sets A and C to be intersecting?

(a) A ∩ C = φ (b) A ∩ C ≠φ

(c) A∪C = φ (d) A∪C ≠φ

(v) Write the n[P (B)].

(a) 8 (b) 4

(c) 16 (d) 12

4.The school organised a cultural event for 100students. In the event, 15 students participated in

dance, drama and singing. 25 students participated in dance and drama; 20 students

participated in drama and singing; 30 students participated in dance and singing. 8 students

participated in dance only; 5 students in drama only and 12 students in singing only.

Based on the above information, answer the following questions.

(i) The number of students who participated in dance, is

(a) 18 (b) 30

(c) 40 (d) 48

(ii) The number of students who participated in drama, is

(a) 35 (b) 30

(c) 25 (d) 20

(iii) The number of students who participated in singing, is

(a) 42 (b) 45

(c) 47 (d) 37

(iv) The number of students who participated in dance and drama but not in singing, is

(a) 20 (b) 5

(c) 10 (d) 15

(v) The number of students who did not participate in any of the events, is

(a) 20 (b) 30

(c) 25 (d) 35