IQRA NATIONAL UNIVERSITY (INU), PESHAWAR

School of Management and Social Sciences (Dept. of Business Administration)

Semester Summer 2020

Program Dept. of Art and Design

Mid Term Assignment

Subject Name: Business Mathematics

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Class Id: 13519

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Mr. Tuheed ur Rehman   **Max Marks: 30**
                                                            Date: 24 August, 2020

Question 1: (4+ 6)

a) Given the sets A = {A, E, I, O, U} and B = {I, J, K}, Draw a Venn diagram of A and B using the universal set U = {A, B, C, …, Z}.

b) Define with examples;

- Equal Set
- Finite and Infinite Set
- Subset

Question 2: (4+6)

a) What are the four basic rules to solve an equation?

b) Find the solution to the equation

- $8(x - 1) + 17(x - 3) = 4(4x - 9) + 4$
- $15(x - 1) + 4(x + 3) = 2(7 + x)$

Question 3: (10)

Solve the following equation simultaneously using elimination method

$$7x + 2y = 47 \text{ …….... (1)}$$
$$5x - 4y = 1 \text{ ……… (2)}$$

Q # 01

(a) Given the set $A = \{A, E, 1, 0, U\}$ and $B = \{1, J, K\}$, Draw a Venn diagram of A and B using the Universal set $U = \{A, B, C, \ldots Z\}$.
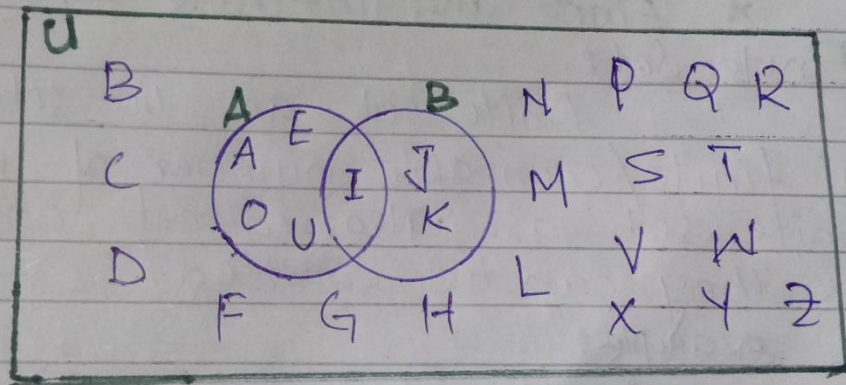
SOLUTION :

Given Data :

$$A = \{A, E, 1, 0, U\}$$

$$B = \{1, J, K\}$$

$$U = \{A, B, C, D, \ldots, Z\}$$

So,

Venn Diagram

Q#01:
(b) Define with examples:

• Equal Set
• Finite and infinite Set
• Subset

SOLUTION :

⁎ Equal Set :
Two sets are called equal if they have exactly the same elements.

Example :
(i) $\{1, 3, 5, 7\}$ and $\{7, 5, 3, 1\}$
(ii) $\{$January, March, May, November$\}$ and May, March, January, November$\}$

⁎ Finite and Infinite Set :

Finite Set :
Finite set are the sets having a finite/countable number of members. Finite set are also called countable set, as they can be counted.

Example :
(i) $P = \{0, 3, 6, 9, \cdots, 99\}$
(ii) $Q = \{a : a$ is an integer, $1 < a < 10\}$

Infinite Set :
If a set is not finite, it is called an infinite set because the

number of elements in that set is not countable and also we cannot represent it in Roster form. Thus, infinite set are also called uncountable set.

Example:

(i) A set of whole number, $W = \{0, 1, 2, \ldots\}$

(ii) The set of integers, $Z = \{0, \pm1, \pm2, \ldots\}$

* **Subset:**

A set "A" is a subset of another set "B" if all elements of the set "A" are elements of the set "B".

OR

the set "A" is contained inside the set "B".

It is denoted by $A \subseteq B$.

Example:

(i) If $A = \{2, 4, 6\}$ and $B = \{0, 1, 2, 3, 4, 5, 6\}$, then $A \subseteq B$.

(ii) If $P = \{March, May\}$ and $R = \{March, April, May, June, July\}$, Then $P \subseteq R$.

Q # 02:

(a) What are the four basic rules to solve the equation?

Answer: There are four basic rules;

(i) An equal quantity may be added to both sides of an equation.

(ii) An equal quantity may be subtracted from both sides of an equation.

(iii) An equal quantity may multiply both sides of an equation.

(iv) An equal, non-zero quantity may divided both sides of an equation.

(b) Find the solution to the equation

- $8(x-1) + 17(x-3) = 4(4x-9) + 4$
- $15(x-1) + 4(x+3) = 2(7+x)$

Solution:

- $8(x-1) + 17(x-3) = 4(4x-9) + 4$

Sol: Removing the brackets from both sides first and then simplifying:

$$8(x-1) + 17(x-3) = 4(4x-9) + 4$$

$$\Rightarrow 8x - 8 + 17x - 51 = 16x - 36 + 4$$

⟹ $25x - 59 = 16x - 32$

Adding 59 to both sides:

$$25x = 16x - 32 + 59$$

⟹ $25x = 16x + 27$

Subtracting 16x from both sides:

$$25x - 16x = 27$$

⟹ $9x = 27$

Dividing both sides with 9:

$$\frac{9x}{9} = \frac{27^3}{9_1}$$

⟹ $x = 3$ Ans

• $15(x-1) + 4(x+3) = 2(7+x)$

Sol: Removing the brackets from both sides first and then simplifying:

$$15(x-1) + 4(x+3) = 2(7+x)$$

⟹ $15x - 15 + 4x + 12 = 14 + 2x$

⟹ $19x - 3 = 2x + 14$

Adding 3 both sides:

$$19x = 2x + 14 + 3$$
$$\Rightarrow \quad 19x = 2x + 17$$

Subtracting 2x from both sides:

$$19x - 2x = 17$$
$$\Rightarrow \quad 17x = 17$$

Dividing both sides with 17:

$$\frac{17x}{17} = \frac{17}{17}$$
$$x = 1 \quad Ans$$

Q #03:

Solve the following equation simultaneously using elimination method

$$7x + 2y = 47 \longrightarrow (1)$$
$$5x - 4y = 1 \longrightarrow (2)$$

SOLUTION:

$$7x + 2y = 47 \longrightarrow (1)$$
$$5x - 4y = 1 \longrightarrow (2)$$

Multiply equation (1) by 2;

$$14x + 4y = 94 \rightarrow (3)$$

Now add equation (2) and (3)

$$5x - 4y = 1$$
$$+ \quad 14x + 4y = 94$$
$$\overline{\qquad\qquad\qquad}$$
$$19x = 95$$

and so,

$$\frac{19x}{19} = \frac{95}{19}$$

$$x = 5$$

Now put the value of x in equation (2) we get

$$5x - 4y = 1$$
$$\Rightarrow \quad 5(5) - 4y = 1$$
$$\Rightarrow \quad 25 - 4y = 1$$
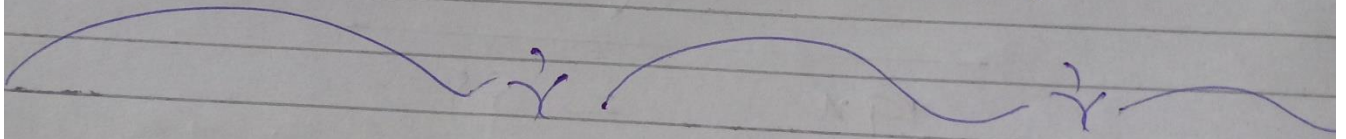$$\Rightarrow \quad 25 = 4y + 1$$
$$\Rightarrow \quad 25 - 1 = 4y$$

$$\Rightarrow \quad 24 = 4y$$

$$\Rightarrow \quad \frac{24}{4} = \frac{4y}{4}$$

$$\Rightarrow \quad y = 6$$

The Solution is $\quad x = 5, \; y = 6$

END