Part (1)

(1) Choose the correct answer:

1) $\mathbb{R}$ = ……

a) $\mathbb{R}_+ \cup \mathbb{R}_-$ b)] - ∞ , + ∞ [c)] - ∞ , 0] d)] 0 , + ∞ [

2) The opposite figure represents the interval ……

a) [-3 , 5] b)] -3 , 5 [

c) [-3 , 5 [d)] -3, 5]

3) If the volume of the sphere is $\frac{9}{16}\pi$ cm^3 then its radius length …….

a) 3 π cm b) 3 cm c) $\frac{4}{3}$ cm d) $\frac{3}{4}$ cm

4) $\sqrt{8} - \sqrt{2}$ = ……

a) $\sqrt{2}$ b) 2 c) $\sqrt{6}$ d) 4

5) If the volume of the sphere is $\frac{32}{3}\pi$ cm^3 then its diameter is of length equals ……

a) 2 cm b) 4 cm c) 8 cm d) 32 cm

6) [– 3 , 7 [– { – 3 , 7 } = ……

a) [– 3 , 7 [b)] – 3 , 7] c)] – 3 , 7 [d) (0 , 0)

7) { 8 , 9 , 10 } –] 8 , 10 [= ……

a) ∅ b) { 8 , 10 } c) { 9 } d) $\mathbb{N}$

8) The volume of a cube is 125 cm^3, then its total area equals ……..

a) 25 cm^2 b) 50 cm^2 c) 125 cm^2 d) 150 cm^2

9)] – 3 , 5 [∩ [0 , 3 [= ……

a) [0 , 3] b) [0 , 3 [c)] – 3 , 0 [d) [3 , 5 [

10) $\frac{1}{2}\sqrt{20} + 10\sqrt{\frac{1}{5}}$ = ……

a) $3\sqrt{5}$ b) $4\sqrt{5}$ c) 5 d) 12

11) The volume of a right circular cylinder is 90 π cm^3 and its height is 10 cm then the radius length of its base equals ……

a) 3 cm b) 4.5 cm c) 5 cm d) 9 cm

12) If $x = \sqrt{7} + \sqrt{3}$ and $y = \sqrt{7} - \sqrt{3}$ then xy = ……

a) 4 b) 10 c) 40 d) 58

13) The edge length of a cube is 4 cm, then its volume is ……

a) 16 cm^3 b) 24 cm^3 c) 64 cm^3 d) 96 cm^3

14) The volume of a cube is 64 cm^3, then its edge length is ……

a) 32 cm b) 16 cm c) 8 cm d) 4 cm

15) The circumference of a circle is 44 cm then its diameter length is …… ($\pi = \frac{22}{7}$)

a) 14 cm b) 22 cm c) 44 cm d) 154 cm

16) The multiplicative inverse of the number $\sqrt{5}$ is ……

a) $-\sqrt{5}$ b) $\frac{-1}{\sqrt{5}}$ c) $\frac{\sqrt{5}}{5}$ d) $\frac{5}{\sqrt{5}}$

17) [– 3 , 4] ∩ [2 , 6] = ……

a) [– 3 , 2] b) [– 3 , 6] c) [2 , 4] d)] 2 , 6 [

18) If the radius length of a sphere is 3 cm, then its volume is …….

a) 4 π cm^3 b) 9 π cm^3 c) 27 π cm^3 d) 36 π cm^3

19) [– 3 , 6] – {– 3 , 6 } = ……

a)] – 3 , 6 [b)] – 3 , 2 [c)] – 3 , 2] d) ∅

20) The S.S of the inequality –1 < x + 3 < 3 in $\mathbb{R}$ is ……

a) [– 4 , 0] b) [2 , 6] c)] – 4 , 0 [d)] 2 , 6 [

21) $\frac{1}{2}\sqrt{48}$ = 2 × ……..

a) $\sqrt{3}$ b) $\sqrt{12}$ c) $\sqrt{96}$ d) 192

22) The expression $\frac{\sqrt{25-9}}{\sqrt{25}-\sqrt{9}}$ = ……..

a) – 1 b) 1 c) 2 d) 3

23) The S.S of the in equality 3 ≤ x + 2 < 5 in $\mathbb{R}$ equals ……..

a) [1 , 3 [b)] 1 , 3] c) [1 , 3] d)] 1 , 3 [

24) If the volume of a sphere equals 36 π cm^3, then its radius length is ……..

a) $\sqrt[3]{3}$ cm b) $\sqrt{3}$ cm c) 3 cm d) 9 cm

25) The S.S of the inequality – 2 x ≥ 6 in $\mathbb{R}$ is ……..

a)] – ∞ , –3 [b)] –∞ , –3] c) [– 3 , +∞ [d)] – 3 , +∞ [

(2) Complete the following:

1) [2 , 5] – { 2 , 5 } = ……..

2) If – x < 2 then x ∈ ……..

3) { – 1 , 0 , 1 } ∩] – 1 , 1 [= ……..

4)] – ∞ , 1] ∩ [– 4 , ∞ [= ……..

5) If $\sqrt{x} = \sqrt{2} + 1$ then x = ……..

6)] 2 , 5] ∩ [2 , 5 [= ……..

7) $\sqrt[3]{64} = \sqrt{\ldots\ldots}$

8) The multiplicative inverse of the number $\frac{3}{\sqrt{3}}$ is $\frac{\ldots\ldots}{\sqrt{3}}$

9) The S.S of the inequality – x + 1 ≤ 0 in $\mathbb{R}$ is ……..

10) If x = $\sqrt[3]{3} + 1$ and y = $\sqrt[3]{3} - 1$ then $(x + y)^3$ = ……..

11) [2 , ∞ [– [4 , ∞ [= ……..

12) If the side length of a square is L cm and its area is 30 cm^2, then the area of the square whose side length 2 L cm is ……..

13) The sum of lengths of all edges of a cube is 36 cm then, its total area equals …….. cm^2.

14) If $2 < x < 5$ then $3x - 1 \in$ ……..

15) The relation $y = 3x + 4$, and $x = 1$, then y = ……..

(3) Answer the following questions:

1) Reduce to the simplest form: $\sqrt{75} - \sqrt[3]{-125} + \frac{10}{\sqrt{3}-1}$

2) A right circular cylinder, whose height equals the radius length of its base and its volume equals 27π cm^3 calculate its lateral surface area.

3) Solve in $\mathbb{R}$ the inequality $5 - 2x \leq 9$ then represent the solution set on the number line.

4) Find the S.S of inequality $3x < 2x + 4$ in $\mathbb{R}$ and represent the interval of solution on the number line.

5) If $x = \sqrt{3} + 2$ and $y = \frac{1}{\sqrt{3}-2}$ find the value of $x \times y$

6) The area of one face of a cube is 36 cm^2 find the length of its edge, and its volume.

7) Find the S.S of the inequality $1 < x + 1 \leq 4$ in $\mathbb{R}$ then represent the interval of solution on the number line.

8) Reduce to the simplest form $2\sqrt{5}(\sqrt{5} - 2) + \sqrt{20} + 10\sqrt{\frac{1}{5}}$

9) If $x = \frac{1}{2+\sqrt{3}}$ and $y = \frac{12}{\sqrt{3}}$ then find the value of the expression $x^2 + y$ in its simplest form.

10) Find in the form of an interval the S.S of the inequality $\frac{3x+1}{6} < x + 1 < \frac{x+4}{2}$ in $\mathbb{R}$ and represent it on the number line.

11) Find the value of $\sqrt{75} - 2\sqrt{27} + 3\sqrt{\frac{1}{3}}$

12) If x = $\sqrt{13} - \sqrt{7}$ and y = $\sqrt{13} + \sqrt{7}$ then prove that $\frac{y-x}{\sqrt{7}} = \frac{1}{3}$ xy

13) Find the S.S of the inequality $5 \leq 3 - x < 7$ in $\mathbb{R}$ and represent the interval of solution on the number line.

14) Write in the form of an interval the S.S of the inequality $-1 < 5 - 2x < 7$ in $\mathbb{R}$, then represent the solution on the number line.

15) If $\frac{x}{4-\sqrt{3}} = 4 + \sqrt{3}$ then fine the value of x

16) If $x = \sqrt{5} + \sqrt{2}$ then prove that $\frac{6}{x} + 2x = 4\sqrt{5}$

17) If x = $2\sqrt{2} - \sqrt{3}$ and y = $\frac{5}{2\sqrt{2}-\sqrt{3}}$, then prove that x and y are two conjugate numbers.

18) If a – b = $2\sqrt{5}$, then find the value of:

a $(a - b)^3 - b (a - b)^3$

Part (2)

(1) Answer the following questions:

1) If x = $\sqrt{7}+3$ and y = $\sqrt{7}-3$ then find the value of $\left(\frac{x+y}{xy}\right)^2$

2) Find the S.S of the inequality 3 ≤ x + 2 ≤ 6 in $\mathbb{R}$ in the form of an interval then show which of the two numbers 1 or $\sqrt{7}$ belongs to the S.S

3) If $x = 2\sqrt{3}-\sqrt{2}$ and $y = \sqrt{12}+\sqrt{2}$ then find the value of $\frac{x+y}{xy+2}$

4) Find the volume of the sphere whose radius length equals the radius length of the base of a right circular cylinder of 7536 cm^3 and its height is 24 cm. (= 3.14)

5) Find the S.S of the inequality 3 + 2x ≤ 7 in $\mathbb{R}$ then represent the interval of solution on the number line.

6) Find the total s. area of a right circular cylinder of radius length of its base is $\frac{7}{\sqrt{2}}$ cm and its height is 10 $\sqrt{2}$ cm. ($\pi = \frac{22}{7}$)

7) Reduce to the simplest form: $\sqrt[3]{16}-\frac{1}{3}\sqrt[3]{54}+\sqrt[3]{-2}$

8) If $x = \frac{5}{\sqrt{7}-\sqrt{2}}$ and $y = \frac{5}{\sqrt{7}+\sqrt{2}}$, then find the value of x^2y^2

9) If a = $\sqrt{2}+1$ and b = $\frac{1}{1+\sqrt{2}}$, then find the value of $(a-b)^2$

10) A metallic sphere of radius length 6 cm it is melted and its material has been converted into a right circular cylinder its base radius is of length 6 cm calculate the height of the cylinder.

11) If (a , 2a) satisfies y = x – 1 then find the value of a.

12) Represent the relation y = x + 2 graphically.

Problems on statistic's unit

(1) Complete the following to form a correct mathematic statement:

1) The arithmetic mean of a set of values = $\frac{\text{.....}}{\text{.....}}$

2) The arithmetic mean is one of measures of ……

3) If the marks of eight students in one exam are 35, 12, 39, 22, 28, 32, 26, 21, then the arithmetic mean of these marks is ……

4) The arithmetic mean of the values 18, 35, 24 , 6 equals ……

5) If the arithmetic mean of the numbers 4, 2, x equals 4 then x = ……

6) If the arithmetic mean of the values 9, 6, 5, 14, x is 7 then x = …….

7) If the sum of five numbers equals 30 then the arithmetic mean of these numbers is ……

8) The mode of a set of values is ……

9) The mode of the set of the values 3, 5, 4, 5, 2, 5 is ……

10) The mode of the set of the values 14, 11, 10, 11, 14, 15, 11 is ……

11) If the mode of the set of the values 4, 5, a, 3 is 3 then a = ……..…

12) If the mode of the set of the values 15, 9, x + 1 , 9 , 15 is 9 then x = ……

13) The arithmetic mean of the values 8, 5, 4, 6 is ……

14) If the arithmetic mean of the numbers 3, 3, 2x equals 4 then x = ……

15) If the arithmetic mean of the set of values 1, 6, 4, 4, 5k is 7 then k = ……

16) If the sum of 5 numbers equals 20 then the arithmetic mean of these numbers is ……

17) The value which is the most common of a set of values is called ……

18) The mode of the set of the values 2, 5, 4, 4, 2, 4 is ……

19) The mode of the set of the values 14, 14, 12, 11, 14, 15, 11 is ……

20) The mode of the set of values 4 , 5 , a + 1 , 3 is 3 then a = ……

21) If the mode of the set of the values 15 , 9 , x + 6 , 9 , 15 is 9 then x = ……

22) The median of the set of the values 3 , 5 , 4 , 5, 2 , 5 is ……

23) The median of the set of the values 14 , 11 , 10 , 11 , 14 , 15 , 11 is ……

24) The median of the set of the values 18 , 35 , 24 , 6 equals ……

25) The median of the set of the values 28 , 25 , 24 , 26 , 27 equals ……

26) The point of intersection of the ascending and descending cumulative frequency curves determine on the horizontal axis ……

(2) Choose the correct answer from those given:

1) The order of the median of the set of the values 4 , 5, 6, 7 , 8 is ……

a) third b) fourth c) fifth d) sixth

2) If the order of the median of a set of values is the fourth then the number of these values is ……

a) 3 b) 5 c) 7 d) 9

3) If the order of the median of the set of the values is the fifth, then the number of these values equals ……

a) 5 b) 6 c) 9 d) 10

4) The median of the set of the values 15 , 22 , 9 , 11 , 33 is ……..

a) 9 b) 15 c) 18 d) 90

5) The median of the set of the values 34 , 23 , 25 , 40 , 22 , 4 is ……

a) 22 b) 23 c) 24 d) 25

6) The median of the set of the values 3, 6, 6, 7, 9, 11, 13, 14, 15, 20 is ……

a) 9 b) 10 c) 11 d) 20

7) If the median of the set of the values 27, 45, 19, 24, 28 is x, then x = ……

a) 24 b) 27 c) 28 d) 45

8) If the median of the set of the values k + 1 , k + 2 , k + 5 , k + 4 , k + 3 where k is (a positive number) is 13 then k = ……

a) 2 b) 5 c) 10 d) 13

9) The arithmetic mean of the values 19 , 32 , 27 , 6 , 6 is ……

a) 90 b) 32 c) 18 d) 6

10) If the arithmetic mean of the values 27 , 8 , 16 , 24 , k is 16 then k = ……

a) 5 b) 6 c) 27 d) 84

11) If the arithmetic mean of the values 18 , 23 , 29 , 2k – 1 , k is 18 then k = ……

a) 1 b) 7 c) 29 d) 90

12) The arithmetic mean of the values 3 – a , 5 , 1 , 4 , 2 + a equals ……

a) 1 b) 2 c) 3 d) 15

13) If the arithmetic mean of 6 values is 12, then the sum of these values equals ……

a) 2 b) 6 c) 18 d) 72

14) The arithmetic mean of the values 15 , 22 , 9 , 11 , 33, is ……

a) 9 b) 15 c) 18 d) 90

15) The arithmetic mean of the set of the values 30 , 23 , 25 , 30 , 22 is ……

a) 22 b) 23 c) 24 d) 26

16) The set which its lowest boundary is 2 and its upper boundary is 6, then its centre is ……

a) 2 b) 6 c) 4 d) 8

17) The set which its lowers limit is 5 and its upper limit is 7, then its centre is ……

a) 7 b) 6 c) 4 d) 5

(3) Questions for getting the result:

(1) Find the mode of each of the following:

a) 12 , 15 , 11 , 12 , 14 b) 4 , 7 , 5 , 7 , 6 , 5 , 8 , 7

(2) Find the median of each of the following set of values:

27, 36, 42, 49, 33, 47, 28, 50, 40

(3) Find the arithmetic mean of the following values:

12, 27 , 32 , 6 , 33

(4) If the arithmetic mean of the values 29, 18, 24 , 5 , 43, x is 20, then find the value of x.

(5) Find the arithmetic mean of the following frequency distribution:

Sets	10-	30-	50-	70-	90-	Total
Frequency	4	6	8	7	5	30

(6) Find by using the following frequencies distribution.

Sets	0-	2-	4-	6-	k-	Total
Frequency	m	5	8	7	2	25

a) The value of k and m

b) The median using the ascending cumulative curve.

c) The arithmetic mean.

d) The mode.

(7) Using the following frequency distribution find:

Sets	0-	2-	k-	6-	8-	Total
Frequency	4	6	9	m + 2	1	25

a) The value of k and m

b) The median using the descending cumulative frequency curve of this distribution.

Model Answers

Part (1)

(1) Choose

1) b	2) c	3) c
4) a	5) b	6) b
7) b	8) d	9) b
10) a	11) a	12) a
13) c	14) d	15) a
16) c	17) c	18) d
19) a	20) c	21) a
22) c	23) a	24) c
25) b		

(2) complete

1)] 2 , 5 [	2)] -2 , ∞ [	3) { 0 }
4) [-4 , 1]	5) $3 + 2\sqrt{2}$	6)] 2 , 5 [
7) 16	8) $\frac{1}{\sqrt{3}}$	9) [1 , ∞ [

10) $\left(\sqrt[3]{3}+1+\sqrt[3]{3}-1\right)^3=\left(2\sqrt[3]{3}\right)^3=8\times3=24$

11) [2 , 4 [

12) $L=\sqrt{30}$, $2L=2\sqrt{30}$

$A=(2L)^2=\left(2\sqrt{30}\right)^2$

$=4\times30=120\ cm^2$

13) E = $\frac{Sum\ of\ edges}{12} = \frac{36}{12} = 3\ cm$

Face area = 3 × 3 = 9 cm^2

Total area = 9 × 6 = 54 cm^2

14) 2 < x < 5 (multiply all terms by 3)

2 × 3 < 3x < 5 × 3

6 < 3x < 15 (Add - 1 to all terms)

6 - 1 < 3x - 1 < 15 - 1

5 < 3x - 1 < 14

3x - 1 ∈] 5 , 14 [

15) y = 7

(3) **1)** $5\sqrt{3} - (-5) + \frac{10}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$

$= 5\sqrt{3} + 5 + \frac{10(\sqrt{3}+1)}{2} = 5\sqrt{3} + 5 + 5\sqrt{3} + 5$

$= 10\sqrt{3} + 10$

2) ∵ A of cylinder = π r^2h and r = h

The area = π r^3

π r^3 = 27 π

r = 3

Lateral area = $2\pi r \times h = 2\pi r^2 = 2\pi \times 9 = 18\pi$ cm^2

3) 5 – 2x ≤ 9 Add (–5) to both sides

– 2x ≤ 4 divide by (–2)

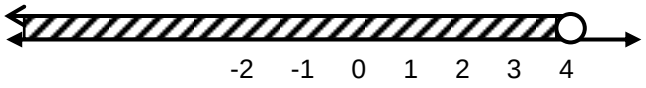
x ≥ – 2

S.S = [– 2, ∞ [

4) $3x < 2x + 4$

$x < 4$

S.S = $]-\infty , 4[$



5) $x \times y = (\sqrt{3}+2) \times \frac{1}{\sqrt{3}-2} = \frac{\sqrt{3}+2}{\sqrt{3}-2} \times \frac{\sqrt{3}+2}{\sqrt{3}+2}$

$= \frac{(\sqrt{3}+2)^2}{3-4} = -(\sqrt{3}+2)^2 = -(3+4\sqrt{3}+4)$

$= -(7+4\sqrt{3}) = -7-4\sqrt{3}$

6) $E = \sqrt{36} = 6$ cm

$v = E^3 = 6^3 = 216$ cm^3

7) $1 < x + 1 \leq 4$

$zero < x \leq 3$

S.S = $]0 , 3]$

8) $2\sqrt{5}(\sqrt{5}-2) + \sqrt{20} + 10\sqrt{\frac{1}{5}} = 10 - 4\sqrt{5} + 2\sqrt{5} + 10 \times \frac{1}{\sqrt{5}}$

$= 10 - 4\sqrt{5} + 2\sqrt{5} + 10 \times \frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$

$= 10 - 4\sqrt{5} + 2\sqrt{5} + 2\sqrt{5} = 10$

9) $x = \frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = \frac{2-\sqrt{3}}{4-3} = 2-\sqrt{3}$

$y = \frac{12}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 4\sqrt{3}$

$x^2 + y = (2-\sqrt{3})^2 + 4\sqrt{3} = 4 - 4\sqrt{3} + 3 + 4\sqrt{3} = 7$

10) $6 \times \left(\frac{3x+1}{6}\right) < 6\,(x+1) < 6 \times \frac{x+4}{2}$ (multiply by 6)

$3x + 1 < 6\,(x + 1) < 3x + 12$

$3x + 1 < 6x + 6 < 3x + 12$ (Add (-3x) to all terms)

$1 < 3x + 6 < 12$

$-5 < 3x < 6$

$\frac{-5}{3} < x < 2$

S.S = $]-\frac{5}{3}, 2[$

11) $\sqrt{75} - 2\sqrt{27} + 3\sqrt{\frac{1}{3}} = 5\sqrt{3} - 2 \times 3\sqrt{3} + 3 \times \frac{\sqrt{1}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$= 5\sqrt{3} - 6\sqrt{3} + \sqrt{3} = zer$

12) L.H.S $\frac{y-x}{\sqrt{7}} = \frac{\sqrt{13}+\sqrt{7}-\sqrt{13}+\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{\sqrt{7}} = 2 \rightarrow (1)$

R.H.S $\frac{1}{3}xy = \frac{1}{3}(\sqrt{13} - \sqrt{7})(\sqrt{13} + \sqrt{7})$

$= \frac{1}{3}(13 - 7) = \frac{1}{3} \times 6 = 2 \rightarrow (2)$

Then $\frac{y-x}{\sqrt{7}} = \frac{1}{3}xy$

13) $5 \leq 3 - x < 7$

$2 \leq -x < 4$

$-2 \geq x > -4$

S.S = $]-4, -2]$

14) $-5-1<-2x<7-5$

$-6<-2x<2$

$3>x>-1$

S.S =] – 1 , 3 [

15) $\frac{x}{4-\sqrt{3}} = 4+\sqrt{3}$

$x = (4+\sqrt{3})(4-\sqrt{3})$

$x = 16 - 3 = 13$

16) $\frac{6}{x} + 2x = \frac{6}{\sqrt{5}+\sqrt{2}} \times \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}} + 2(\sqrt{5}+\sqrt{2})$

$= \frac{6(\sqrt{5}-\sqrt{2})}{5-2} + 2\sqrt{5} + 2\sqrt{2}$

$= 2\sqrt{5} - 2\sqrt{2} + 2\sqrt{5} + 2\sqrt{2} = 4\sqrt{5} = R.H.S$

17) $y = \frac{5}{2\sqrt{2}-\sqrt{3}} \times \frac{2\sqrt{2}+\sqrt{3}}{2\sqrt{2}+\sqrt{3}} = \frac{5(2\sqrt{2}+\sqrt{3})}{8-3} = 2\sqrt{2}+\sqrt{3}$

∴ x & y are conjugate numbers.

18) $a(a-b)^3 - b(a-b)^3 = (a-b)^3(a-b)$

$= (2\sqrt{5})^3 \times (2\sqrt{5})$

$= 8 \times 5\sqrt{5} \times 2\sqrt{5} = 400$

Part (2)

(1) Answer the following questions:

1) $x + y = 2\sqrt{7}$ $\quad xy = 7 - 9 = -2$

$\frac{2\sqrt{7}}{-2} = -\sqrt{7}$

2) $3 \leq x + 2 \leq 6$

$3 - 2 \leq x \leq 6 - 2$

$1 \leq x \leq 4$

S.S = [0 , 4]

3) $x + y = 2\sqrt{3} + \sqrt{12}$

$= 2\sqrt{3} + 2\sqrt{3} = 4\sqrt{3}$

$xy = (2\sqrt{3} - \sqrt{2})(2\sqrt{3} + \sqrt{2})$

$= 4 \times 3 - 2 = 10$

$\frac{x+y}{xy+2} = \frac{4\sqrt{3}}{10+2} = \frac{4\sqrt{3}}{12} = \frac{1}{3}\sqrt{3}$

4) Volume of cylinder = π r^2 h = 7536

$3.14 \times 24 \times r^2 = 7536$ cm^3

$75.36\ r^2 = 7536$

$r^2 = 7536 \times 75.36 = 100$

$r = \sqrt{100} = 10$ cm

volume of sphere = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times 3.14 \times 10^3 = 4186.67$ cm^3

5) $2x \leq 7 - 3$

$2x \leq 4$

$x \leq 2$

S.S = $]-\infty, 2]$

6) $r = \frac{7 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{7\sqrt{2}}{2}$

L.A of cylinder = $2\pi rh$

$= 2 \times \frac{22}{7} \times \frac{7\sqrt{2}}{2} \times 10\sqrt{2} = 440 \text{ cm}^2$

T.A = L.A + $2\pi r^2$

$= 440 + 2 \times \frac{22}{7} \times \left(\frac{7\sqrt{2}}{2}\right)^2 = 594 \text{ cm}^2$

7) $2\sqrt[3]{2} - \frac{1}{3} \times 3\sqrt[3]{2} - \sqrt[3]{2}$

$= 2\sqrt[3]{2} - \sqrt[3]{2} - \sqrt[3]{2} = 0$

8) $x = \frac{5(\sqrt{7}+\sqrt{2})}{(\sqrt{7}-\sqrt{2})(\sqrt{7}+\sqrt{2})} = \frac{5(\sqrt{7}+\sqrt{2})}{7-2}$

$= \frac{5(\sqrt{7}+\sqrt{2})}{5} = \sqrt{7} + \sqrt{2}$

$y = \frac{5(\sqrt{7}-\sqrt{2})}{(\sqrt{7}+\sqrt{2})(\sqrt{7}-\sqrt{2})} = \frac{5(\sqrt{7}-\sqrt{2})}{7-2}$

$y = \sqrt{7} - \sqrt{2}$

$y^2x^2 = (xy)^2 = (7-2)^2$

$= 5^2 = 25$

9) $b = \frac{1(1-\sqrt{2})}{(1+\sqrt{2})(1-\sqrt{2})} = \frac{1-\sqrt{2}}{1-2} = \frac{1-\sqrt{2}}{-1} = \sqrt{2} - 1$

$(a - b)^2 = \left[(\sqrt{2}+1) - (\sqrt{2}-1)\right]^2 = [\sqrt{2} + 1 - \sqrt{2} + 1]^2 = (1)^2 = 1$

10) Volume of cylinder = $\pi r^2 h$ = 3.14 × 6^2 × h = $\frac{4}{3}$ × 3.14 × 6^3

113.04 h = 904.32

h = 904.32 ÷ 113.04 = 8 cm

11) y = x – 1

2a = a – 1 (a, 2a) = (x, y)

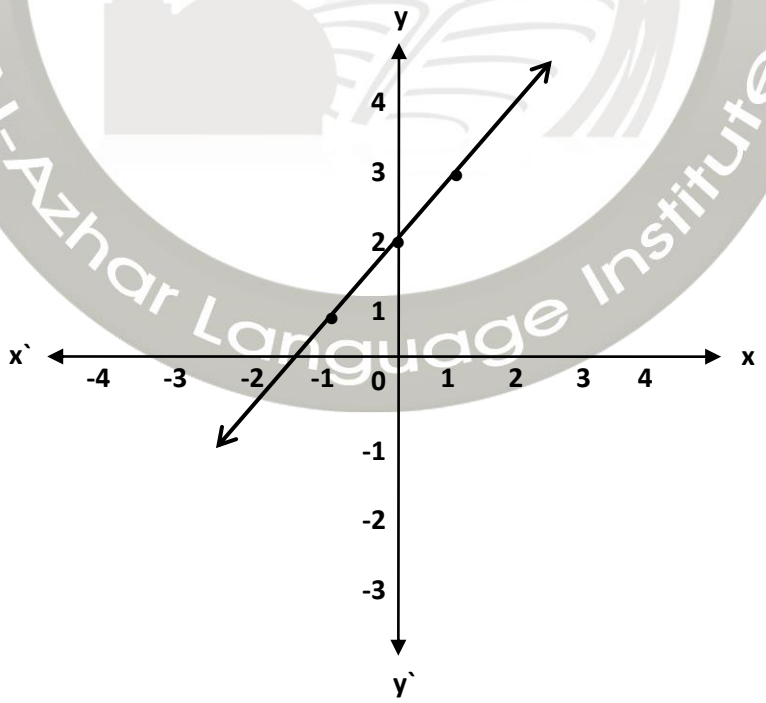
2a – a = – 1

a = – 1

12) if x = – 1 y = – 1+ 2 = 1 (–1 , 1)

if x = 0 y = 0 + 2 = 2 (0 , 2)

if x = 1 y = 1 + 2 = 3 (1 , 3)



Problems on statistic's unit

(1) Complete the following to form a correct mathematic statement:

1) = $\frac{Sum\ of\ values}{number\ of\ thies\ values}$

2) central tendency of a set of values

3) 215 ÷ 8 = 26.875

4) 83 ÷ 4 = 20.75

5) $\frac{4+2+x}{3} = 4$

$\frac{6+x}{3} = 4$ $\quad 6 + x = 12$

x = 12 – 6 = 6

6) $\frac{9+6+5+14+x}{5} = 7$

$\frac{34+x}{5} = 7$ $\quad 34 + x = 35$

x = 1

7) 30 ÷ 5 = 6

8) most common value in the set

9) 5

10) 11

11) 3

12) = 8

13) 18 ÷ 4 = 4.5

14) $x = \frac{6+2x}{3} = 4$

6 + 2x = 12

2x = 6 $\quad$ x = 3

15) $\frac{1+6+4+4+5k}{5} = 7$

15 + 5k = 35

5k = 35 – 15 = 20

k = 20 ÷ 5 = 4

16) 20 ÷ 5 = 4

17) mode | 18) 4 | 19) 14

20) 2 | 21) 3 | 22) 4

23) 11 | 24) 21 | 25) 26

26) median

(2) Choose the correct answer from those given:

1) third | 2) 7 | 3) 9 | 4)15

5) 24 | 6) 10 | 7) 27 | 8) 10

9) 18 | 10) 5 | 11) 7 | 12) 3

13) 72 | 14)18 | 15) 26 | 16) 4

17) 6

(3) Questions for getting the result:

(1) a) 12 , b) 7 **(2)** 40 **(3)** $\frac{110}{2} = 22$

(4) $= \frac{119+x}{6} = 20$

$119 + x = 120$

$x = 120 - 119 = 1$

(5) Center of set $= \frac{Upper\ limit + lower\ limit}{2}$

Sets	Frequency (f)	Center of set (x)	f × x
10-	4	$\frac{10+30}{2} = 20$	80
30-	6	$\frac{30+50}{2} = 40$	240
50-	8	60	480
70-	7	80	560
90-	5	100	500
Total	30		1860

Mean $= \frac{Sum\ of\ (x \times f)}{Sum\ of\ f} = \frac{1860}{30} = 62$

(6)

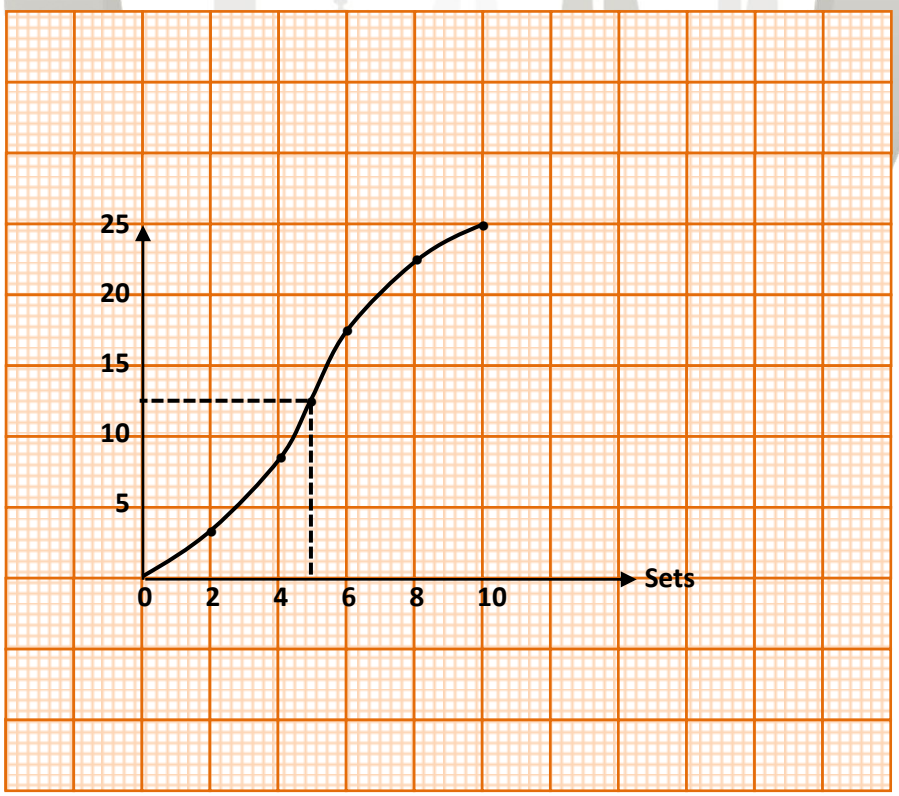
a) k = 8- m = 25 - (5 + 8 + 7 + 2) = 3

b) Ascending accumulative freq. table

The upper limit	Ascending cumulative freq.
less than 0	0
less than 2	0 + 3 = 3
less than 4	3 + 5 = 8
less than 6	8 + 8 = 16
less than 8	16 + 7 = 23
less than 10	23 + 2 = 25

The order of median = $\frac{Total\ Frequency}{2} = \frac{25}{2} = 12.5$

Median ≃ 5

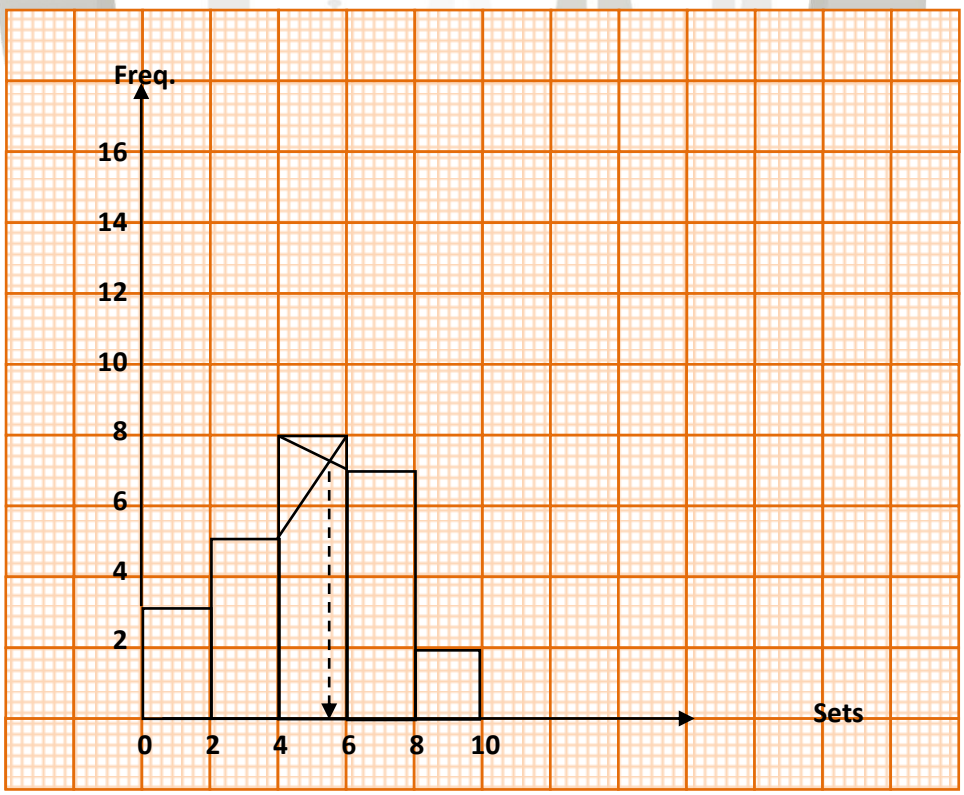


c) Mean = $\frac{Sum\ of\ (x \times f)}{Sum\ of\ f}$

Sets	Frequency (f)	Center of set (x)	f × x
0-	3	$\frac{0+2}{2} = 1$	3
2-	5	$\frac{2+4}{2} = \frac{6}{2} = 3$	15
4-	8	$\frac{4+6}{2} = 5$	40
6-	7	= 7	49
8-	2	= 9	18
Total	25		125

Mean = $\frac{125}{25}$ = 5

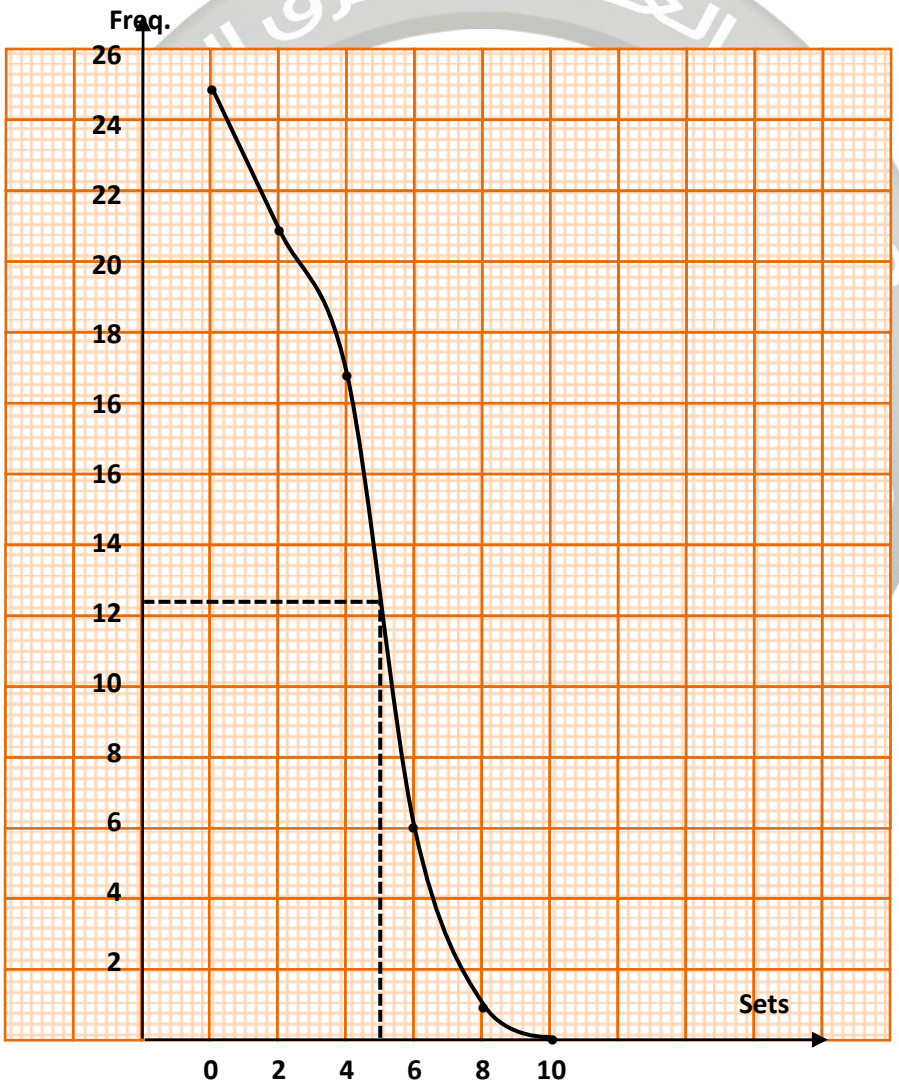
d) Mode ≃ 5.5



(7) a) k = 4- m = 3

b) Descending cumulative frequency table:

The upper limit	Ascending cumulative freq.
0 and more	21 + 4 = 25
2 and more	15 + 6 = 21
4 and more	6 + 9 = 15
6 and more	1 + 5 = 6
8 and more	0 + 1 = 1
10 and more	= 0



The order of median = $\frac{Total\ Frequency}{2} = \frac{25}{2} = 12.5$

Median ~ 5