CA

Test-06

Sampurna 2.0 January 2025

Quantitative Aptitude

Q1 ${}^4P_4$ is evaluated as
(A) 1 (B) 24
(C) 0 (D) None of these

Q2 The solution set of the inequations x + 2 > 0 and 2x - 6 > 0 is
(A) (-2, ∞) (B) (3, ∞)
(C) (-∞, -2) (D) (-∞, -3)

Q3 A person can go from place 'A' to 'B' by 11 different modes of transport but is allowed to return back to 'A' by any mode other than the one earlier. The number of different ways, the entire journey can be complete is
(A) 110 (B) 10^{10}
(C) 9^5 (D) 10^9

Q4 The distribution of profits of a company follows:
(A) J-shaped frequency curve
(B) U-shaped frequency curve
(C) Bell-shaped frequency curve
(D) Any of these

Q5 Frequency density corresponding to a class interval is the ratio of
(A) Class Frequency to the total frequency
(B) Class Frequency to the class length
(C) Class Frequency to the class frequency
(D) Class Frequency to the cumulative frequency

Q6 There are 20 points in a plane area. How many triangles can be formed by these points if 5 points are collinear?
(A) 550 (B) 560
(C) 1130 (D) 1140

Q7 Out of 1000 persons, 25 per cent were industrial workers and the rest were agricultural workers. 300 persons enjoyed world cup matches on TV. 30 per cent of the people who had not watched world cup matches were industrial workers. What is the number of agricultural workers who had enjoyed world cup matches on TV?
(A) 260 (B) 240
(C) 230 (D) 250

Q8

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency	8	12	5	15	20

For the class 10-15, the cumulative frequency is:
(A) 5 (B) 12
(C) 25 (D) 29

Q9 If $3x + 2 < 2x + 5$ and $4x - 5 \geq 2x - 3$, then x can take from the following values
(A) 3 (B) -1
(C) 2 (D) -3

Q10 How many 3 digit odd numbers can be formed using the digits $5,\ 6,\ 7,\ 8,\ 9$, if the digits can be repeated?
(A) 55 (B) 75
(C) 65 (D) 85

Q11 Ogive for more than type and less than type distributions intersect at
(A) Means (B) Median
(C) Mode (D) Origin

Q12 Cost of sugar in a month under the heads raw materials, labour, direct production and others were 12, 20, 35 and 23 units respectively. What is the difference between the central angles for the largest and smallest components of the cost of sugar?
(A) 72° (B) 48°
(C) 56° (D) 92°

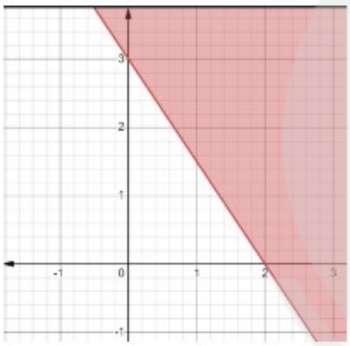
Q13 The number of arrangements of the word 'COMMERCE' is

(A) $8!$
(B) $\frac{8!}{2!\times 2!\times 2!}$
(C) $5!$
(D) none of these

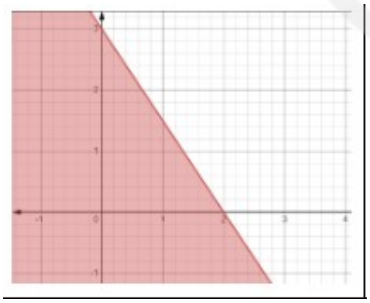
Q14 A dealer has ₹5760 to invest in fans (x) and sewing machines (y). The cost per unit of fan and sewing machine is ₹360 and ₹240 respectively. This can be shown by
(A) $360x + 240y \geq 5760$
(B) $360x + 240y \leq 5760$
(C) $360x + 240y = 5760$
(D) None of these

Q15 Which is the left part of the table providing the description of the rows?
(A) Caption (B) Box head
(C) Stub (D) Body

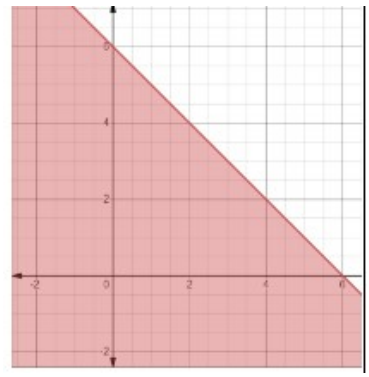
Q16 The graph to express the inequality 3x + 2y $\leq$6 is
(A)



(B)



(C)



(D) None of the above

Q17 The curve obtained by joining the points, whose - coordinates are the upper limits of the class-intervals and coordinates are corresponding cumulative frequencies is called
(A) Ogive
(B) Histogram
(C) Frequency Polygon
(D) Frequency Curve

Q18 The number of parallelogram that can be formed from a set of four parallel lines intersecting another set of three parallel lines is
(A) 6 (B) 18
(C) 12 (D) 9

Q19 If ${}^nP_6 = 20 \times {}^nP_4$ where P denotes number of permutations, then the value of n is
(A) 5 (B) 3
(C) 9 (D) 8

Q20 The amount of non-responses is maximum in
(A) Mailed questionnaire method
(B) Interview method
(C) Observation method
(D) All of these

Q21 A table has
(A) Four (B) Two
(C) Five (D) None Parts

Q22 The quickest method to colléct primary data is:
(A) Personal Interview
(B) Indirect Interview
(C) Mailed Questionnaire Method
(D) Telephonic Interview

Q23 The time required to produce a unit of product A is 3 hours and that for product B is 5 hours. The total available time is 220 hours. If x and y are the number of units of A and B that are produced then
(A) $3x + 2y = 220$
(B) $3x + 2y \geq 220,\ x \geq 0,\ y \geq 0$
(C) $3x + 2y \leq 220,\ x \geq 0,\ y \geq 0$

(D) $5x + 2y \geq 220,\ x \geq 0,\ y \geq 0$

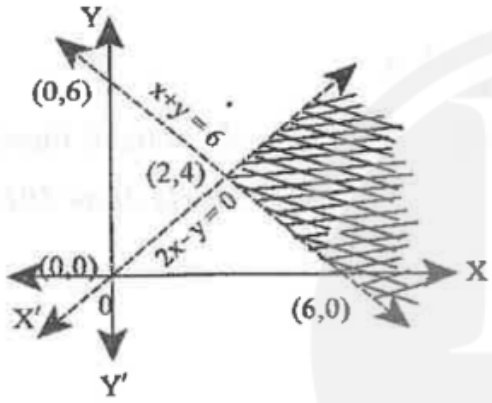
Q24 How many numbers of seven digit numbers which can be formed from the digits 3, 4, 5, 6, 7, 8, 9 no digits being repeated are not divisible by 5?

(A) 4320 (B) 4690
(C) 3900 (D) 3890

Q25 An Ogive can be prepared in _____ different ways.

(A) One (B) Two
(C) Three (D) None

Q26 The shaded region represents:



(A) x + y > 6, 2x - y > 0
(B) x + y < 6, 2x - y > 0
(C) x + y > 6, 2x - y < 0
(D) None of these

Q27 The number of ways in which 7 girls form a ring is

(A) 700 (B) 710
(C) 720 (D) none of these

Q28 A business houses wishes to simultaneously elevate two of its six branch heads. In how many ways these elevation can take place?

(A) 12 (B) 3
(C) 6 (D) 15

Q29 Following are the scores obtained by 50 students in a mathematics test:
78, 84, 92, 70, 68, 79, 81, 90, 85, 73, 72, 88, 76, 80, 83, 87, 75, 77, 82, 69, 91, 86, 74, 67, 89, 71, 94, 66, 68, 95, 69, 93, 66, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95.
If we want to construct a frequency distribution with 10 as class length, what should be the number of class intervals?

(A) 2 (B) 3
(C) 4 (D) None of these

Q30 For the non-overlapping classes 0–19 , 20–39 , 40–59 the class mark of the class 0–19 is

(A) 0 (B) 19
(C) 9.5 (D) none

Q31 There are 12 questions which are to be answered as Yes or No. How many ways can these be answered ?

(A) 1024 (B) 2048
(C) 4096 (D) None

Q32 An employer recruits experienced (x) and fresh workmen (y) for his under the condition that he can not employ more than 11 people and y can be related by the inequality.

(A) $x + y \neq 11$
(B) $x + y \leq 11,\ x \geq 0,\ y \geq 0$
(C) $x + y \geq 11,\ x \geq 0,\ y \geq 0$
(D) None of these

Q33 The accuracy and consistency of data can be verified by

(A) Scrutiny
(B) Internal Checking
(C) External Checking
(D) Double Checking

Q34 When one end of a class is not specified, the class is called

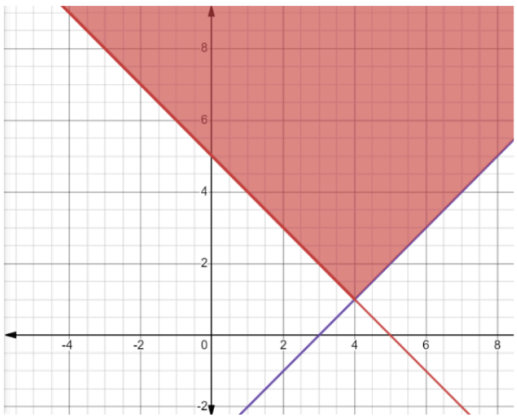
(A) Closed- end class
(B) Open- end class
(C) Both
(D) None

Q35 Data collected on religion from the census reports are

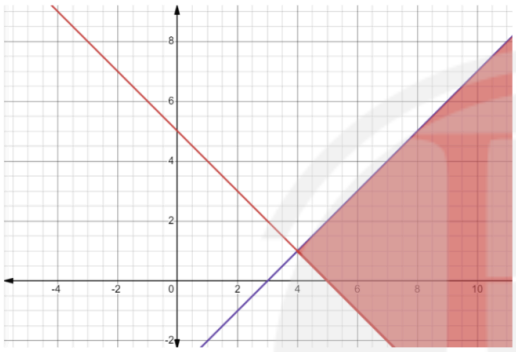
(A) Primary data
(B) Unclassified data
(C) Sample data
(D) Secondary data

Q36 Which of the following graph represents the inequalities:
$x + y \geq 5$ and $x - y \leq 3$?

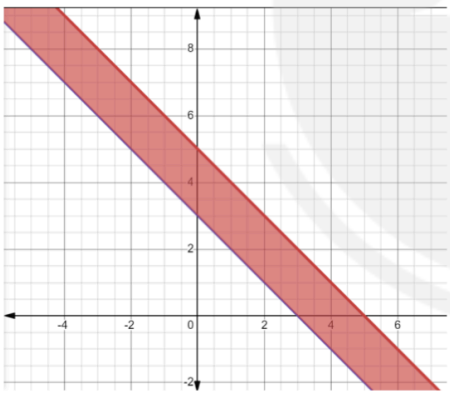
(A)



(B)



(C)



(D) None of the above

Q37 Most of the commonly used distributions provide
(A) Bell - Shaped
(B) U Shaped
(C) J - Shaped Curve
(D) Mixed Curve

Q38 How many permutations can be formed from the the letters of the word "DRAUGHT", if both vowels may not be separated?
(A) 720 (B) 1440
(C) 140 (D) 1000

Q39 A small manufacturing firm produces two types of gadgets A and B, which are first processed in the foundry, and then sent to another machine for finishing. The number of man-hours for the firm available per week are as follows:

	Foundry	Machine-shop
A	10	5
B	6	4
Capacity per week (man hours)	1000	600

Let the firm manufacture x units of A and y units of B. The constraints are:
(A) $10x + 6y \leq 1000, 5x + 4y \geq 600, x \geq 0; y \leq 0$
(B) $10x + 6y \leq 1000, 5x + 4y \leq 600, x \geq 0; y \geq 0$
(C) $10x + 6y \geq 1000, 5x + 4y \leq 600, x \leq 0; y \geq 0$
(D) None of these

Q40 Find the number of observations between 250 and 300 from the following data:

Value	More than 200	More than 250	More than 300	More than 350
No. of observations	56	38	15	0

(A) 56 (B) 23
(C) 15 (D) 8

Q41 If the class intervals are
$10 - 14, 15 - 19, 20 - 24, \ldots\ldots\ldots$
then the first class boundary is:
(A) 9.5 - 14.5 (B) 10 - 15
(C) 9 - 15 (D) 10.5 - 15.5

Q42 The solution of the inequality $\frac{(5-2x)}{3} \leq \frac{x}{6} - 5$ is
(A) $x \geq 8$ (B) $x \leq 8$
(C) $x = 8$ (D) None of these

Q43 In a graphical representation of data, the smallest numerical value is 4 and the largest numerical value is 25. If classes desired are 4, then the class interval is
(A) 45 (B) 5
(C) 20 (D) 7.5

Q44 There are 20 points in a plane area. How many triangles can be formed by these points if 5 points are collinear?

(A) 550 (B) 560

(C) 1130 (D) 1140

Q45 The number of diagonals in a decagon is

(A) 30 (B) 35

(C) 45 (D) none of these

Q46 On the average an experienced person does 5 units of work while a fresh one 3 units of work daily but the employer has to maintain an output of at least units of work per day. This situation can be expressed as:

(A) $5x + 3y \leq 30$

(B) $5\ x + 3y > 30$

(C) $5x + 3y \geq 30, x \geq 0, y \geq 0$

(D) none of these

Q47 Which of the following diagram is the most appropriate to represents various heads in total cost?

(A) Pie chart

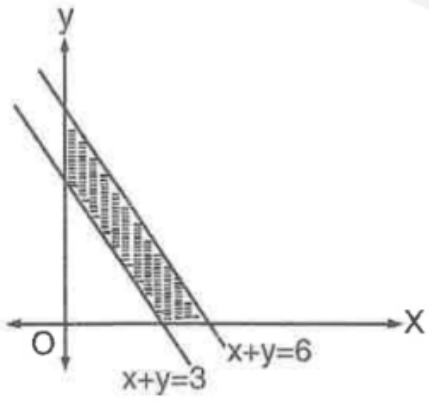
(B) Bar graph

(C) Multiple line chart

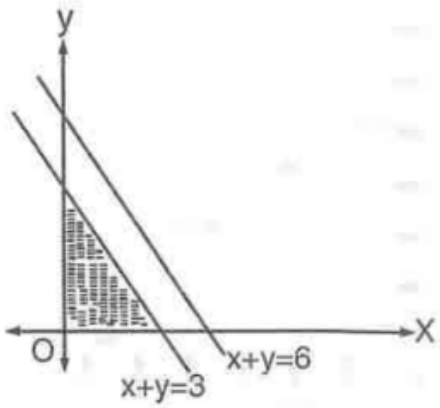
(D) Scatter plot

Q48 The common region of $x + y \leq 6,\ x + y \geq 3$ is shown by the shaded region:

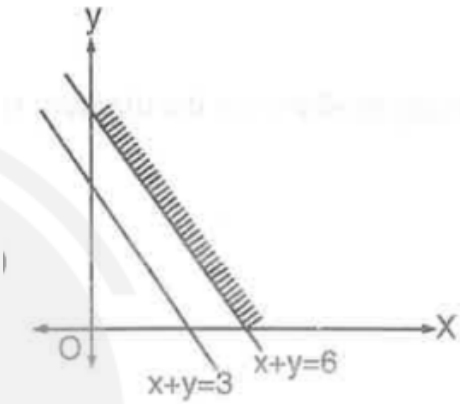
(A)



(B)



(C)



(D) None of these

Q49 If ${}^{n}P_{3}\ :\ {}^{n}P_{2} = 3\ :\ 1$,, then n is equal to

(A) 7 (B) 4

(C) 5 (D) None of these

Q50 Out of 6 boys & 4 girls, find the number of ways for selecting 5 members for a committee in which there are exactly two girls?

(A) 120 (B) 1440

(C) 720 (D) 71

CA

Answer Key

Q1	(B)	Q26	(A)
Q2	(B)	Q27	(C)
Q3	(A)	Q28	(D)
Q4	(C)	Q29	(B)
Q5	(B)	Q30	(C)
Q6	(C)	Q31	(C)
Q7	(A)	Q32	(B)
Q8	(C)	Q33	(A)
Q9	(C)	Q34	(B)
Q10	(B)	Q35	(D)
Q11	(B)	Q36	(A)
Q12	(D)	Q37	(A)
Q13	(B)	Q38	(B)
Q14	(B)	Q39	(B)
Q15	(C)	Q40	(B)
Q16	(B)	Q41	(A)
Q17	(A)	Q42	(A)
Q18	(B)	Q43	(B)
Q19	(C)	Q44	(C)
Q20	(A)	Q45	(B)
Q21	(A)	Q46	(C)
Q22	(D)	Q47	(A)
Q23	(C)	Q48	(A)
Q24	(A)	Q49	(C)
Q25	(B)	Q50	(A)

Hints & Solutions

Q1 Text Solution:

We know that,

$^nP_r = \frac{n!}{(n-r)!}$

Thus, $^4P_4 = \frac{4!}{(4-4)!}$

$= \frac{4!}{0!}$

$= \frac{4!}{1}$

$= 4 \times 3 \times 2 \times 1$

$= 24$

Hence, option (B) is correct.

Q2 Text Solution:

Since, x + 2 > 0

⇒ x > -2 ....(i)

Also, 2x - 6 > 0

⇒ 2x > 6

⇒ x > 3 ....(ii)

From (i) and (ii), the common solution set will be:

x > 3

i.e., (3, ∞)

Hence, the correct option is (B) i.e. (3, ∞).

Q3 Text Solution:

Modes of transport while going A to B $= 11$

Modes of transport while going B to A $= 10$

Total ways $= 11 \times 10 = 110$

Hence, the correct option is (A) i.e. 110.

Q4 Text Solution:

We know,

The distribution of profits of a company follows Bell-shaped frequency curve.

Q5 Text Solution:

Frequency density corresponding to a class interval is the ratio of class Frequency to the class length.

Q6 Text Solution:

Given,

Total points = 20

No. of collinear points = 5

We know that, 3 points are required to form a triangle for which atleast 2 points should be non-collinear.

Thus, the required triangles = $^{20}C_3$ - $^5C_3$

$= \frac{20!}{3! \times 17!} - \frac{5!}{3! \times 2!}$

$= \frac{20 \times 19 \times 18}{3 \times 2} - \frac{5 \times 4}{2 \times 1}$

= 1140 - 10

= 1130

Therefore, 1130 triangles can be formed using the given points.

Hence, the correct option is (C).

Q7 Text Solution:

Given:

Number of people =1000

Number of Industrial Workers =25%

$\frac{25}{100} \times 1000 = 250$

Number of Agricultural Workers

$= (100 - 25)\% = 75\%$

$= \frac{75}{100} \times 1000 = 750$

Number of people who enjoyed World Cup

$= 300$

Number of people who did not enjoy World Cup

$= (1000 - 300)$

$= 700$

Number of people who did not watch World Cup were industrial workers

$= \frac{30}{100} \times 700$

$= 210$

Number of industrial workers who enjoyed world cup

$= 250 - 210$

$= 40$

Number of agricultural workers who enjoyed World Cup

$= 300 - 40$

$= 260$

Hence, the correct answer is option (A) i.e., 260.

Q8 Text Solution:

According to the question,

Make a data table in order to calculate cumulative frequency.

Class	Frequency	Cumulative Frequency
$0 - 5$	8	8
$5 - 10$	12	$8 + 12 = 20$
$10 - 15$	5	$20 + 5 = 25$
$15 - 20$	15	$25 + 15 = 40$
$20 - 25$	20	$40 + 20 = 60$

As we can see, cumulative frequency corresponding to the class 10 - 15 is 25.
Hence, the correct option is (C) i.e., 25.

Q9 Text Solution:

Given,
$3x + 2 < 2x + 5$
$\Rightarrow 3x - 2x < 5 - 2$
$\Rightarrow x < 3$
Also,
$4x - 5 \geq 2x - 3$
$\Rightarrow 4x - 2x \geq 5 - 3$
$\Rightarrow 2x \geq 2$
$\Rightarrow x \geq 1$
Thus, $1 \leq x < 3$
Therefore, out of the given options, we have the value of x = 2 satisfying the above condition.

Q10 Text Solution:

Given digits: 5, 6, 7, 8, 9
$\Rightarrow$ Total digits $= 5$
To form 3 digit odd number, the unit place can be filled in 3 ways $(5,\ 7,\ 9)$.
Since, the digits can be repeated, thus the tens and hundreds place can be filled in 5 ways each.
Therefore, the total required ways
$= 5 \times 5 \times 3 = 75.$

Q11 Text Solution:

We know,
Ogive for more than type and less than type distributions intersect at Median.

Q12 Text Solution:

Given: Cost of raw materials = 12 units
Cost of raw materials = 20 units
Cost of raw materials = 35 units
Cost of raw materials = 23 units
Total units $= 12 + 20 + 35 + 23 = 90$
Difference between Largest and Smallest Component
$= 35 - 12$
$= 23$
Central angle of difference between largest and smallest component is given as,
$\frac{\text{Difference between largest and smallest component}}{\text{Total components in units}}$
$\times 360^\circ$
$= \frac{23}{90} \times 360^\circ$
$= 92^\circ$

Q13 Text Solution:

The word given is 'COMMERCE'
Total number of letters in 'COMMERCE' is 8.
Number of 'C' $= 2$
Number of 'M' $= 2$
Number of 'E' $= 2$
Therefore number of arrangements $= \frac{8!}{2! \times 2! \times 2!}$

Q14 Text Solution:

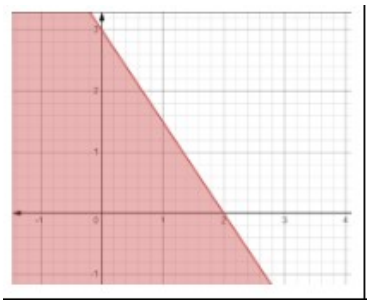
Given: x and y is respectively the number of fans and sewing machines bought by dealer
Since, the cost of fan per unit is ₹360 and the cost of sewing machine per unit is ₹240.
Therefore, the total cost will be 360x + 240y.
Also, the dealer has only ₹5760 to invest.
Therefore, $360x + 240y \leq 5760$

Q15 Text Solution:

We know, Stub is the left part of the table providing the description of the rows.

Q16 Text Solution:

Given inequality: 3x + 2y $\leq$6
For line of equation of above inequality: 3x + 2y = 6
When
x = 0 then y = 3
When y = 0 then x = 2
Thus, the coordinates satisfying the equation is (0, 3) and (2, 0).
Now, on putting x = 0 and y = 0 in the above inequality, we get
3x + 2y = 3(0) + 2(0) = 0 $\leq$6 which is true
So, the shaded region will be towards the origin.
Thus, the required graph is:



Hence, the correct option is (B).

Q17 Text Solution:

The curve obtained by joining the points, whose x- coordinates are the upper limits of the class-intervals and y coordinates are corresponding cumulative frequencies is called **ogive**.

Ogives or Cumulative Frequency Graph

By plotting cumulative frequency against the respective class boundary, we get ogives. As such there are two ogives – less than type ogives, obtained by taking less than cumulative frequency on the vertical axis and more than type ogives by plotting more than type cumulative frequency on the vertical axis and thereafter joining the plotted points successively by line segments. Ogives may be considered for obtaining quartiles graphically. If a perpendicular is drawn from the point of intersection of the two ogives on the horizontal
axis, then the x-value of this point gives us the value of median, the second or middle quartile. Ogives further can be put into use for making short term projections.

Hence, option (A) is the correct answer

Q18 Text Solution:

Parallelogram is formed by choosing two parallel lines. Number of parallelogram when ' m' numbers of parallel lines intersect with 'n' numbers of parallel lines is equal to ${}^{m}C_{2} \times {}^{n}C_{2}$.

So, total number of parallelogram that can be formed

$= {}^{4}C_{2} \times {}^{3}C_{2}$

$= 6 \times 3$

$= 18$

Hence, option (B) is correct i.e., 18.

Q19 Text Solution:

Given: ${}^{n}P_{6} = 20 \times {}^{n}P_{4}$

$\Rightarrow \frac{n!}{(n-6)!} = 20 \times \frac{n!}{(n-4)!}$

$\Rightarrow \left(n-4\right)! = 20 \times \left(n-6\right)!$

$\Rightarrow \left(n-4\right) \times \left(n-5\right) = 20$

$\Rightarrow n^{2} - 9n + 20 = 20$

$\Rightarrow n\left(n-9\right) = 0$

$\Rightarrow n - 9 = 0$

$\Rightarrow n = 9$

or

Since, $(n-4) \times (n-5) = 20$

$(n-4) \times (n-5) = 5 \times 4$

On comparing, $(n-4) = 5$

$\Rightarrow n = 9$

Q20 Text Solution:

Mailed questionnaire method comprises of framing a well-drafted and soundly-sequenced questionnaire covering all the important aspects of the problem under consideration and sending them to the respondents with pre-paid stamps after providing all the necessary guidelines for filling up the questionnaire. Although a wide area can be covered using the mailed questionnaire method, the amount of non-responses is likely to be maximum in this method.

Hence, option (A) is the correct answer i.e. Mailed questionnaire method.

Q21 Text Solution:

A table has four parts which are enlisted below:-

1. The Title
2. The Box Head which has column captions
3. The Stub which has row captions
4. The Body

Hence, the correct answer is option (A) i.e., Four.

Q22 Text Solution:

The methods for the collection of data are:

1) Personal interview
2) Indirect interview
3) Mailed questionnaire method
4) Telephonic Interview

Out of the all above mentioned methods, telephonic interview is the fastest method to collect primary data as it does not require anybody to travel or spend some money. The interviews or surveys are conducted over a phone call. This method does not work in some areas because of the lack of telephones. However, it is a good method to collect information especially on some sensitive issues as the interrogator and the person cannot see each other.
Therefore, telephonic interview is the fastest method to collect primary data.
Hence, the correct option is (D) i.e. Telephonic Interview.

Q23 Text Solution:
Given, the number of units of A and B produced is x and y respectively.
Since, the total available time is 220 hours, thus
According to the question,
$3x + 5y \leq 220$
Also, the number of units is always positive, thus
$x \geq 0,\ y \geq 0$

Q24 Text Solution:
Given digits: $3, 4, 5, 6, 7, 8, 9$
Total arrangements of digits $= 7!$
Now, numbers divisible by $5 = 6!$ (keeping 5 fix at units place)
Thus, total number of 7-digits numbers not divisible by 5
= Total arrangements - Numbers divisible by 5
$= 7! - 6!$
$= 5040 - 720$
$= 4320$
Hence, the correct option is (A) i.e. 4320.

Q25 Text Solution:
We know that,
An Ogive can be prepared in different ways i.e.
1) Less than type ogives
2) More than type ogives
Hence, the correct option is (B) i.e. Two.

Q26 Text Solution:
Let us consider a point in the shaded portion of the intersection of lines.
Taking the point (7, 1).
Now, let us substitute this point in all the inequalities for each option and check if it satisfies the inequalities.
For option (A),
$\Rightarrow x + y > 6$
$\Rightarrow 7 + 1 = 8 > 6$, which is true
$\Rightarrow 2x - y > 0$
$\Rightarrow 2(7) - 1 = 13 > 0$, which is true
All inequalities are satisfied.
For option (B),
$\Rightarrow x + y < 6$
$\Rightarrow 7 + 1 = 8$, which is not less than 6 .
Inequalities are not satisfied.
For option (C),
$\Rightarrow x + y > 6$
$\Rightarrow 7 + 1 = 8 > 6$, which is true
$\Rightarrow 2x - y < 0$
$\Rightarrow 2(7) - 1 = 13$, which is not less than 0 .
Inequalities are not satisfied.
For option (D), as all the inequalities in option (A) are satisfied by the point (7, 1) in the shaded region, so the option (D) is incorrect.
Thus, the shaded region represents:
$x + y > 6,\ 2x - y > 0$
Hence, the correct option is (A).

Q27 Text Solution:
We know that,
The number of circular permutation of n different things chosen at a time $(n-1)!$
Thus, the number of ways in which 7 girls from a ring is $(7-1)!\ = 720$
Hence, option (C) is correct i.e., 720.

Q28 Text Solution:
Required ways $= {}^6C_2$
$= \frac{6!}{(6-2)! \times 2!}$
$= \frac{6 \times 5}{2}$
$= 15$

Q29 Text Solution:

We know that,

Number of class intervals $= \frac{\text{Range}}{i}$

Now, Range = Maximum value - Minimum value

$= 96 - 66 = 30$

Also, class length $(i) = 10$

Thus, number of class intervals

$= \frac{\text{Range}}{i} = \frac{30}{10} = 3$

Hence, the correct option is (B) i.e. 3 .

Q30 Text Solution:

Class mark:

Corresponding to a class interval, this may be defined as the sum of the lower class limit and upper class limit divided by 2.

Thus, the class mark of the class 0–19 is:

$$Class\ mark = \frac{LCL + UCL}{2}$$

$$= \frac{0 + 19}{2}$$

$$= 9.5$$

Hence, the correct option is (C) i.e. 9.5.

Q31 Text Solution:

Given: Number of questions = 12

Possibilities of answering a question (Yes/No) = 2

According to the question,

Number of ways these questions can be answered will be given as,

$= 2^n$ (Here, n = 12)

$= 2^{12}$

= 4096

Hence, the correct option is (C) i.e., 4096.

Q32 Text Solution:

Given,

Number of experienced workmen = x

Number of fresh workmen = y

Since, the employer cannot employ more than 11 people, thus the required inequality will be:

$x + y \leq 11$

Also, number of workmen cannot be less than 0 i.e.,

$x \geq 0,\ y \geq 0$

Q33 Text Solution:

As we know, the accuracy and consistency of data can be verified with a strict scrutiny.

Scrutiny ensures the redundancy of the data but also ensures the genuine methodologies and practices used for accumulation of data.

To maintain consistency of data, for any process scrutiny is very important.

Hence, the correct option is (A) i.e., Scrutiny.

Q34 Text Solution:

When one end of a class is not specified, the class is called open- end class .

For example:

Let the wages received by workers in a factory are classified as:

Wages	Number of workers
Less than 1000	8
1000-2000	15
2000-3000	12
3000-4000	9
More than 4000	5

Here, the lower limit of the first class and the upper limit of the last class are not specified, thus they are open end classes.

Hence, the correct option is (B) i.e. Open-end class.

Q35 Text Solution:

As we know, Secondary data is information gathered on religion from census records. Since it is not user-collected, secondary data is second-hand information.

Therefore, secondary data refers to information that has previously been gathered and made public by another authority.

A government census report is an illustration of secondary data.

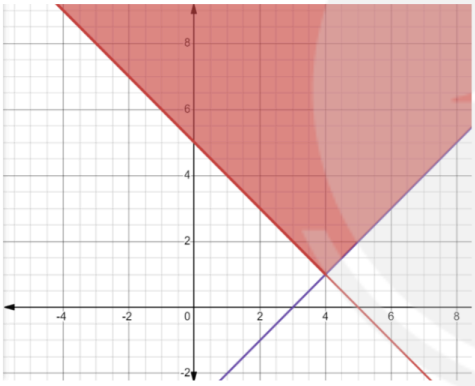
Hence, the correct option is (D) i.e., Secondary data.

Q36 Text Solution:

Given: $x + y \geq 5$ and $x - y \leq 3$

For line of equation: $x + y = 5$

When $x = 0$ then $y = 5$
When $y = 0$ then $x = 5$
Thus, the coordinates satisfying the equation is $(0,\ 5)$ and $(5,\ 0)$.
Now, on putting $x = 0$ and $y\ =\ 0$ in inequality $x + y \geq 5$, we get
$x + y = 0 + 0 = 0 \geq 5$ which is false
So, the shaded region will be away from the origin.
For line of equation: $x - y = 3$
When $x = 0$ then $y =\ -3$
When $y = 0$ then $x = 3$
Thus, the coordinates satisfying the equation is $(0,\ -3)$ and $(3,\ 0)$.
Now, on putting $x = 0$ and $y\ =\ 0$ in inequality $x - y \leq 3$, we get
$x - y = 0 - 0 = 0 \leq 3$ which is true
So, the shaded region will be towards the origin.
Thus, the required graph of both the inequalities is:



Hence, the correct option is (A).

Q37 **Text Solution:**
As we know, A bell curve, commonly known as the normal distribution, is a typical type of distribution for a variable.
The graph that is used to represent a normal distribution has a symmetrical bell-shaped curve, hence the name "bell curve."
All other potential occurrences are symmetrically distributed around the mean, resulting in a downward-sloping curve on either side of the peak, while the highest point on the curve, or the top of the bell, represents the most probable event in a series of data (its mean, mode, and median in this case).
The standard deviation of the bell curve serves as a measure of its width.
Hence, the correct option is (A) i.e., Bell - Shaped.

Q38 **Text Solution:**
Given word; DRAUGHT (7 Letters)
DRAUGHT has 5 consonants and 2 vowels
According to the question,
Consider 2 vowels as a single letter, now the total letters in the word DRAUGHT becomes 6
The above scenario can be arranged in 6! ways.
Both the vowels can arranged in 2! ways among themselves.
Total permutations = $6! \times 2!$
= 720×2
= 1440
Hence, the correct option is (B) i.e., 1440.

Q39 **Text Solution:**
Let, the firm manufactures x units of A and y units of B.
According to the question,
For foundry,
$10x + 6y \leq 1000$
and for Machine-shop,
$5x + 4y \leq 600$
Thus, the constraints are;
$10x + 6y \leq 1000,\ 5x + 4y \leq 600,\ x \geq 0;\ y \geq 0$

Q40 **Text Solution:**
Given,

Value	More than 200	More than 250	More than 300	More than 350
No. of observations	56	38	15	0

According to the question,
Number of observations between 250 and 300 will be given by,
= (Observations more than 250) - (Observations more than 300)
= 38 - 15
= 23
Hence, the correct answer is option (B) i.e., 23.

Q41 Text Solution:

According to the question,

Class Intervals: $10 - 14, 15 - 19, 20 - 24$

Class size is given by the difference of upper limit and lower limit of the class interval.

$\therefore$ Class size $= 14 - 10 = 4$

Now, Diagonal difference (D) between upper class limit and lower class limit will be,

$D = 15 - 14 = 1$

So, Lower class boundary (LCB) will be given by,

$LCB =$ Lower class limit $- \left(\frac{1}{2}\right) D$

$= 10 - \left(\frac{1}{2}\right) 1 = 9.5$

and, Upper class boundary (UCB) will be given by,

$UCB =$ Upper class limit $+ \left(\frac{1}{2}\right) D$

$= 14 + \left(\frac{1}{2}\right) 1 = 14.5$

So, the first class boundary is $9.5 - 14.5$

Hence, the correct answer is option (A) i.e., $9.5 - 14.5$.

Q42 Text Solution:

Given that,

$\frac{(5-2x)}{3} \leq \frac{x}{6} - 5$

$\Rightarrow \frac{(5-2x)}{3} \leq \frac{x-30}{6}$

Cross multiply both the sides,

$\Rightarrow 30 - 12x \leq 3x - 90$

$\Rightarrow 30 + 90 \leq 3x + 12x$

$\Rightarrow 120 \leq 15x$

Now, divide both sides by 15, we get

$8 \leq x$ or $x \geq 8$

Hence, option (A) is the correct answer.

Q43 Text Solution:

According to the question,

Given: Smallest Observation $(s) = 4$

Largest Observation $(l) = 25$

Number of class interval $= 4$

Length of class interval is given by the formula,

Length of class Interval

$= \frac{25 - 4}{4}$

$= 5.25 \approx 5$

Hence, the correct answer is option (B) i.e., 5.

Q44 Text Solution:

Given,

Total points $= 20$

No. of collinear points $= 5$

We know that, 3 points are required to form a triangle for which atleast 2 points should be non-collinear.

Thus, the required triangles $= {}^{20}C_3 - {}^{5}C_3$

$= \frac{20!}{3! \times 17!} - \frac{5!}{3! \times 2!}$

$= \frac{20 \times 19 \times 18}{3 \times 2} - \frac{5 \times 4}{2 \times 1}$

$= 1140 - 10$

$= 1130$

Therefore, 1130 triangles can be formed using the given points.

Hence, the correct option is (C).

Q45 Text Solution:

We know that decagon have 10 sides.

The number of diagonal in a polygon having n sides is ${}^{n}C_2 - n$ or $\frac{1}{2}n(n-3)$

Here, $n = 10$

Thus, number of diagonals

$= \frac{1}{2} \times 10 \times (10 - 3)$

$= 5 \times 7 = 35$

Therefore, the number of diagonals in decagon are 35.

Hence, option (B) is correct.

Q46 Text Solution:

Let the number of average experienced people working be x and the fresh one be y per day respectively.

Now, according to the question the output must be min 30 per day.

Thus forming the inequality, we get

$5x + 4y \geq 30.$

Here as x and y are the numbers of persons working per day thus they cannot be negative.

So, $x \geq 0, y \geq 0$

Thus, the final answer is

$5x + 3y \geq 30, x \geq 0, y \geq 0$

Hence, the correct option is (C).

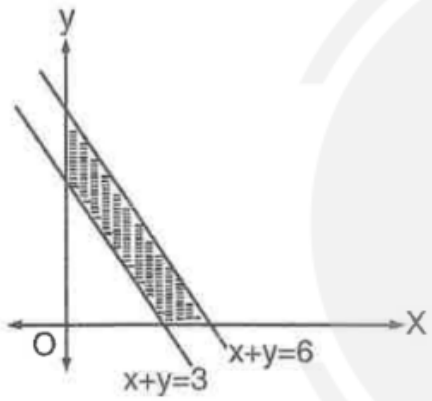
Q47 Text Solution:

As we know, Pie chart is a circular statistical image that shows numerical proportions by

dividing it into slices. In a pie chart, each slice's arc length corresponds to the quantity it depicts. The best diagram to "convey the facts" linked to a "family's monthly spending" on various products is a pie diagram.
It has a circular design and is a statistical chart that has been "split into segments" to help illustrate different numerical ratios.
Hence, the correct option is (A) i.e., Pie chart.

Q48 Text Solution:

The given equations are $x + y \leq 6,\ x + y \geq 3$
We know by the given equations that the value of x + y must be greater than 3 but smaller than 6 thus the given equations can be written as
$3 \leq x + y \leq 6$
This can be depicted in the following graph



Hence, the correct answer is option (A).

Q49 Text Solution:

Given: ${}^{n}P_3 \ : \ {}^{n}P_2 = 3 \ : \ 1,$
$\Rightarrow \frac{{}^{n}P_3}{{}^{n}P_2} = \frac{3}{1}$
$\Rightarrow \frac{\frac{n!}{(n-3)!}}{\frac{n!}{(n-2)!}} = 3$
$\Rightarrow \frac{(n-2)!}{(n-3)!} = 3$
$\Rightarrow \frac{(n-2) \times (n-3)!}{(n-3)!} = 3$
$\Rightarrow n - 2 = 3$
$\Rightarrow n = 2 + 3$
$\Rightarrow n = 5$
Thus, the value of n is 5.
Hence, option (C) is correct i.e., 5.

Q50 Text Solution:

Given:
Number of boys $= 6$
Number of girls $= 4$
Since, 3 boys and 2 girls are to be selected, thus
Total possible ways $= {}^{6}C_3 \times {}^{4}C_2$
$= \frac{6!}{(6-3)! \times 3!} \times \frac{4!}{(4-2)! \times 2!}$
$= 20 \times 6$
$= 120$
Hence, the correct option is (A) i.e. 120.

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