CDS-AFCAT 2 2024

SSBCrack EXAMS

LIVE ●

MATHS

STATISTICS

CLASS 2

NAVJYOTI SIR

21 June 2024 Live Classes Schedule

Time	Class	Instructor
8:00AM	21 JUNE 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	21 JUNE 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

SSB INTERVIEW LIVE CLASSES

Time	Class	Instructor
9:00AM	MOCK PERSONAL INTERVIEW	ANURADHA MA'AM

AFCAT 2 2024 LIVE CLASSES

Time	Class	Instructor
2:30PM	STATIC GK - POLITY - CLASS 1	DIVYANSHU SIR
4:00PM	MATHS - STATISTICS - CLASS 2	NAVJYOTI SIR
5:30PM	ENGLISH - WORD SUBSTITUTION - CLASS 1	ANURADHA MA'AM

NDA 2 2024 LIVE CLASSES

Time	Class	Instructor
11:30AM	GK - ANCIENT HISTORY - CLASS 2	RUBY MA'AM
2:30PM	GS - CHEMISTRY - CLASS 9	SHIVANGI MA'AM
6:30PM	MATHS - DIFFERENTIATION - CLASS 1	NAVJYOTI SIR

CDS 2 2024 LIVE CLASSES

Time	Class	Instructor
11:30AM	GK - ANCIENT HISTORY - CLASS 2	RUBY MA'AM
2:30PM	GS - CHEMISTRY - CLASS 9	SHIVANGI MA'AM
4:00PM	MATHS - STATISTICS - CLASS 2	NAVJYOTI SIR

SSBCrack EXAMS

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Q) Consider the following frequency distribution :

x	Frequency	Cumulative frequency
1	8	8
2	10	18
3	f_1	29
4	f_2	45

What are the values of f_1 and f_2 respectively ?

(a) 10 and 17 (b) 17 and 10
(c) 11 and 16 (d) 16 and 11

$18 + f_1 = 29 \Rightarrow f_1 = 11$

$29 + f_2 = 45 \Rightarrow f_2 = 16$

Q) Consider the following frequency distribution :

x	Frequency	Cumulative frequency
1	8	8
2	10	18
3	f_1	29
4	f_2	45

What are the values of f_1 and f_2 respectively ?

(a)   10 and 17   (b)   17 and 10

(c)   11 and 16   (d)   16 and 11

Ans: (c)

Q) In an asymmetrical distribution, if the mean and median of the distribution are 270 and 220 respectively, then the mode of the data is

(a) 120

(b) 220

(c) 280

(d) 370

$$Mode = 3 \, Median - 2 \, Mean$$

$$= (3 \times 220) - (2 \times 270)$$

$$= 660 - 540$$

$$= 120$$

Q) In an asymmetrical distribution, if the mean and median of the distribution are 270 and 220 respectively, then the mode of the data is

(a) 120

(b) 220

(c) 280

(d) 370

Ans: (a)

Q) Consider the following distribution :

Class	class mark (x_i)	Frequency (f_i)	$d_i = x_i - A$	$u_i = di \frac{}{(20)}$	$\frac{u_i f_i}{}$
0 – 20	10	17	– 40	–2	–34
20 – 40	30	28	– 20	–1	–28
40 – 60	A 50	32	0	0	0
60 – 80	70	f	20	1	f
80 – 100	90	19	40	2	38

$\Sigma f_i = 96 + f$

If the mean of the above distribution is 50, what is the value of f ?

(a) 24   (b) 34

(c) 56   (d) 96

$$\bar{x} = \frac{\Sigma x_i f_i}{\Sigma f_i}$$

$$\bar{x} = A + \left(\frac{\Sigma u_i f_i}{\Sigma f_i}\right) h \Rightarrow 50 = 50 + \left[\frac{(f - 24)}{96 + f} \times 20\right]$$

$$f - 24 = 0$$

$$\Sigma u_i f_i = \underline{\quad}$$

$$-62 + f + 38$$

$$= -24 + f$$

class intervals   class mask   frequency $d_i = x_i - A$ $u_i = d_i/h$

(x_i) (f_i)

(A)

$$\bar{x} = \frac{\sum x_i f_i}{\sum f_i}$$

$$\bar{x} = A + \frac{\sum d_i f_i}{\sum f_i}$$

(Hcf of d_i)

$$\bar{x} = A + \frac{\sum u_i f_i}{\sum f_i} \times h$$

(making x_i values as small as possible)

Q) Consider the following distribution :

Class	Frequency
0–20	17
20–40	28
40–60	32
60–80	f
80–100	19

If the mean of the above distribution is 50, what is the value of f ?

(a) 24 (b) 34

(c) 56 (d) 96

Ans: (a)

Q) The table below gives the number of members of a club classified by sex and nativity:

Nativity Sex	Locals	Migrants	Total
Male	85	45	130
Female	35	35	70
Total	120	80	200

The above data are represented by a pie diagram. What is the sectorial angle of the area representing male-migrant category?

(a) 45°

(b) 22.5°

(c) 81°

(d) 67.5°

F-M

M-L

F-L

M-M
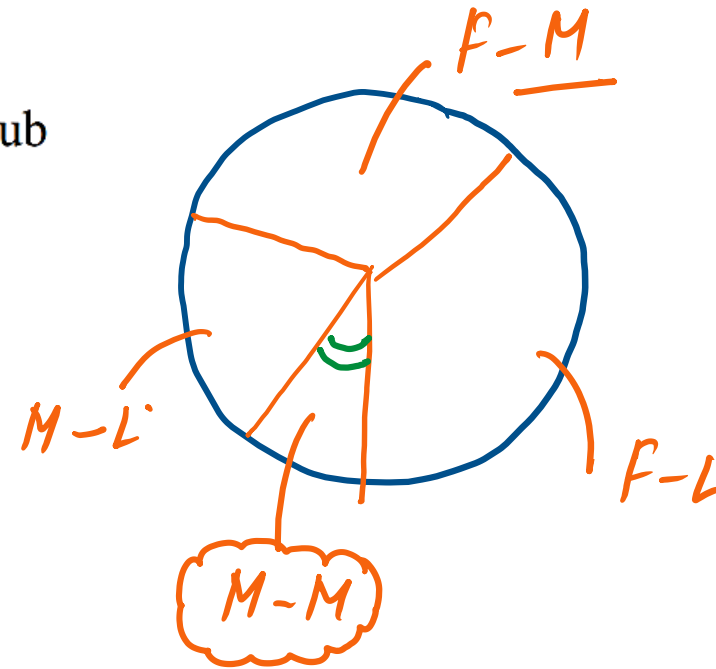
$$\frac{45}{200} \times 360° = 81°$$

$$sectorial\ angle = \frac{part}{whole} \times 360°$$

Q) The table below gives the number of members of a club classified by sex and nativity:

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Male	85	45	130
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Total	120	80	200

The above data are represented by a pie diagram. What is the sectorial angle of the area representing male-migrant category?

(a) 45°   (b) 22.5°
(c) 81°   (d) 67.5°

Ans: (c)

Q) DIRECTIONS : *The item-wise expenditure of a Non-Government Organisation for the year 2008-09 is given below.*

Item	Expenditure (in Rs. lakh)
Salary of employees	6
Social welfare activities	7 ✓
Office contingency	3
Vehicle maintenance	4
Rent and hire charges	2.5
Miscellaneous expenses	1.5

The above data are represented by a pie diagram. What is the central angle of the largest component?

(a) 120°   (b) 105° ✓
(c) 90°   (d) 85°

$$\frac{7}{6+7+3+4+2.5+1.5} \times 360°$$

$$\frac{7}{24} \times 360° = 105°$$

Q) DIRECTIONS : *The item-wise expenditure of a Non-Government Organisation for the year 2008-09 is given below.*

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Salary of employees	6
Social welfare activities	7
Office contingency	3
Vehicle maintenance	4
Rent and hire charges	2.5
Miscellaneous expenses	1.5

The above data are represented by a pie diagram.
What is the central angle of the largest component?

(a) 120°
(b) 105°
(c) 90°
(d) 85°

Ans: (b)

Q) What is the difference between central the angles of the largest and the smallest component?

(a) 90°   (b) 85°

(c) 82.5°   (d) 77.5°

central angle for smallest $= \dfrac{1.5}{24} \times 360^{\circ} = 22.5^{\circ}$

$\dfrac{7 - 1.5}{24} \times 360^{\circ}$

Difference $= 105 - 22.5^{\circ}$

$= 82.5^{\circ}$

(OR) $\dfrac{5.5}{24} \times 360^{\circ}$

$= 75 + 7.5$

$= 82.5^{\circ}$

Q) What is the difference between central the angles of the largest and the smallest component?

(a) 90°

(b) 85°

(c) 82.5°

(d) 77.5°

Ans: (c)

Q) For x > 0, if a variable takes discrete values x + 4, x − 3.5, x − 2.5, x − 3, x − 2, x + 0.5, x − 0.5, x + 5, then what is the median ?

(a) x − 1.25   (b) x − 0.5

(c) x + 0.5   (d) x + 1.25

1) Ascending order,

$$x - 3.5, \ x - 3, \ x - 2.5, \ \boxed{x - 2} \ \boxed{x - 0.5}, \ x + 0.5, \ x + 4, \ x + 5$$

$$\frac{(x-2) + (x-0.5)}{2}$$

2) no. of observations, $n = 8$ (even)

$$\text{Median} = \left\{ \left(\frac{n}{2}\right)^{th} + \left(\left(\frac{n}{2}\right)^{th} + 1\right)^{th} \text{ term} \right\} / 2 = \ = \frac{2x - 2.5}{2} = x - 1.25$$

Q) For $x > 0$, if a variable takes discrete values $x + 4$, $x - 3.5$, $x - 2.5$, $x - 3$, $x - 2$, $x + 0.5$, $x - 0.5$, $x + 5$, then what is the median ?

(a) $x - 1.25$ (b) $x - 0.5$

(c) $x + 0.5$ (d) $x + 1.25$

Ans: (a)

Q)

Consider the following frequency distribution :

Class	Frequency
0-10	4
10-20	5
20-30	7
30-40	10
40-50	12
50-60	8
60-70	4 $\sum f_i = 50$

class mark (x)

5
15
25
A ⃝35
45
55
65

$d = x - A$

-30
-20
-10
0
10
20
30

$u = d/10$

-3
-2
-1
0
1
2
3

uf

-12
-10
-7
0
12
16
12

$\sum uf = 11$

$$\bar{x} = 35 + \left(\frac{11}{50}\right) \times 20 = 35 + 4.4$$

$$= 39.4$$

$$\bar{x} = A + \left(\frac{\sum uf}{\sum f} \times h\right)$$

Q) What is the mean of the distribution?

(a) 37.2   (b) 38.1

(c) 39.2   (d) 40.1

Q) What is the mean of the distribution?

(a)   37.2   (b)   38.1

(c)   39.2   (d)   40.1

Ans: (c)

Q) Ten observations 6, 14, 15, 17, $x + 1$, $2x - 13$, 30, 32, 34 and 43 are written in ascending order. The median of the data is 24. What is the value of x?

(a) 15

(b) 18

(c) 20

(d) 24

$n = 10$,

Median $\longrightarrow \left(\dfrac{10}{2}\right)^{th} \left(\dfrac{10}{2} + 1\right)^{th}$ term

$x + 1$ \qquad $2x - 13$

Median $= \dfrac{x + 1 + 2x - 13}{2} = \dfrac{3x - 12}{2} = 24$

$3x = 60$

$x = 20$

Q) Ten observations $6, 14, 15, 17, x+1, 2x-13, 30, 32, 34$ and 43 are written in ascending order. The median of the data is 24. What is the value of x?

(a) 15

(b) 18

(c) 20

(d) 24

Ans: (c)

Q) Consider the following distribution:

x_i

f_i

Value of the variable	1	2	3	4	5
Frequency	3	f	6	5	3

For what value of f, is the arithmetic mean of the above distribution 3.1?

(a) 2

(b) 3

(c) 4

(d) 5

$$\bar{x} = \frac{\sum x_i f_i}{\sum f_i}$$

$$3.1 = \frac{(1 \times 3) + (2 \times f) + (3 \times 6) + (4 \times 5) + (5 \times 3)}{3 + f + 6 + 5 + 3} = \left\{ \frac{2f + 56}{17 + f} = 3.1 \right\}$$

Q) Consider the following distribution:

Value of the variable	1	2	3	4	5
Frequency	3	f	6	5	3

For what value of f, is the arithmetic mean of the above distribution 3.1?

(a) 2

(b) 3

(c) 4

(d) 5

Ans: (b)

Q) Which one of the following relations for the numbers
10, 7, 8, 5, 6, 8, 5, 8 and 6 is correct?
(a) Mean = Median   (b) Mean = Mode
(c) Mean > Median   (d) Mean > Mode

Mode = 8

$$\text{Mean} = \frac{63}{9} = 7$$

Median   5, 5, 6, 6, ⑦ 8, 8, 8, 10

Q) Which one of the following relations for the numbers
10, 7, 8, 5, 6, 8, 5, 8 and 6 is correct?
(a) Mean = Median   (b) Mean = Mode
(c) Mean > Median   (d) Mean > Mode

Ans: (a)

Q) The arithmetic mean of 11 observations is 11. The arithmetic mean of the first 6 observations is 10.5 and the arithmetic mean of the last 6 observations is 11.5. What is the sixth observation?

(a) 10.0   (b) 10.5
(c) 11.0   (d) 11.5

$$T = \left(\text{Total}\right)_{11} = \underline{121}$$

$$X = \left(\text{Total}\right)_{\text{first } 6} = 6 \times 10.5 = \underline{63}$$

$$Y = \left(\text{Total}\right)_{\text{Last } 6} = 6 \times 11.5 = \underline{69}$$

$$6^{th} \text{ obs.} = \left(X + Y\right) - T$$
$$= \left(63 + 69\right) - 121$$
$$= 132 - 121$$
$$= \boxed{11} \checkmark$$

Q) The arithmetic mean of 11 observations is 11. The arithmetic mean of the first 6 observations is 10.5 and the arithmetic mean of the last 6 observations is 11.5. What is the sixth observation?

(a)   10.0

(b)   10.5

(c)   11.0

(d)   11.5

Ans: (c)

Q) The geometric mean of x and y is 6 and the geometric mean of x, y and z is also 6. Then the value of z is

(a)   12

(b) $\sqrt{6}$

(c)   6

(d) $\sqrt[3]{6}$

$$\sqrt[2]{xy} = 6$$

$$xy = 36 = 6^2$$

$$\sqrt[3]{xyz} = 6$$

$$xyz = 6^3$$

$$6^2 \times z = 6^3$$

$$\boxed{z = 6}$$

Q) The geometric mean of x and y is 6 and the geometric mean of x, y and z is also 6. Then the value of z is

(a)   12

(b) $\sqrt{6}$

(c)   6

(d) $\sqrt[3]{6}$

Ans: (c)

Q) A pie chart depicts the classification of total funds of an organization according to different sources of funds. A particular sector of pie chart for corporate tax has 108° angle at' the centre. What is the percentage of income from corporate tax to total funds ?

(a)   20%   (b)   25%

(c)   30%   (d)   35%

Total funds $= 360° = 100\%$

$$\frac{108°}{360°} \times 100 = 30\%$$

Q) A pie chart depicts the classification of total funds of an organization according to different sources of funds. A particular sector of pie chart for corporate tax has 108° angle at' the centre. What is the percentage of income from corporate tax to total funds ?

(a)   20%   (b)   25%

(c)   30%   (d)   35%

Ans: (c)

Q) DIRECTIONS *Read the following information carefully to answer the questions that follow.*
The average age of 6 persons living in a house is 23.5 years.
Three of them are majors and their average age is 42 years.
The difference in ages of the three minor children is same.
What is the mean of the ages of minor children?

(a) 3 years   (b) 4 years
(c) 5 years   (d) 6 years

Sum of ages of 6 persons $= 23.5 \times 6 = (T)$

" " " 3 major $= 42 \times 3 = (A)$

Sum of ages of 3 minor $= T - A = \underline{B = 15}$

Mean,

$= \dfrac{B}{3} = \dfrac{15}{3}$

$= 5$ years

Q) **DIRECTIONS** *Read the following information carefully to answer the questions that follow.*

The average age of 6 persons living in a house is 23.5 years. Three of them are majors and their average age is 42 years. The difference in ages of the three minor children is same. What is the mean of the ages of minor children?

(a) 3 years   (b) 4 years
(c) 5 years   (d) 6 years

Ans: (c)

Q) What is the median of the ages of minor children?

(a) 3 years   (b) 5 years
(c) 7 years   (d) Cannot be determined

$23.5 \times 6 = 141$

$42 \times 3 = 126$

Sum of ages of minor = 15

difference of their ages is same,

$[5, ⑤, 5]$, $[4, ⑤, 6]$, $[3, ⑤, 7]$, $[2, ⑤, 8]$, $[1, ⑤, 9]$

Q) What is the median of the ages of minor children?

(a) 3 years

(b) 5 years

(c) 7 years

(d) Cannot be determined

Ans: (b)

a, b

$HM = \dfrac{2ab}{a+b}$

Q) Consider the following pairs of numbers:
I. $(8, 12)$ II. $(9, 11)$
III. $(6, 24)$
Which pairs of number have the same harmonic means?
(a) I and II   (b) II and III
(c) I and III   (d) I, II and III

I. $\dfrac{2 \times 8 \times 12}{8+12} = \dfrac{16 \times \cancel{12}^{3}}{\cancel{20}_{5}} = \dfrac{48}{5}$

II. $\dfrac{\cancel{2} \times 9 \times 11}{\cancel{20}_{10}} = \dfrac{99}{10}$

III. $\dfrac{2 \times 6 \times \cancel{24}^{4}}{\cancel{30}_{5}} = \dfrac{48}{5}$

Q) Consider the following pairs of numbers:
  I. $(8, 12)$ II. $(9, 11)$
  III. $(6, 24)$
  Which pairs of number have the same harmonic means?
  (a) I and II   (b) II and III
  (c) I and III   (d) I, II and III

Ans: (c)

Q) In Statistics, a suitable graph for representing the partitioning of total into subparts is

(a) An ogive

(b) A pictograph

(c) A histogram

(d) A pie chart

Q) In Statistics, a suitable graph for representing the partitioning of total into subparts is

(a) An ogive

(b) A pictograph

(c) A histogram

(d) A pie chart

Ans: (d)

Q) What is the mean of the squares of the first 20 natural numbers ?

(a) 151.5

(b) 143.5

(c) 65

(d) 72

sum of first 'n' squares, $1^2 + 2^2 + 3^2 + \cdots n^2$

$$= \frac{n(n+1)(2n+1)}{6}$$

$$\text{Mean} = \frac{\frac{n(n+1)(2n+1)}{6}}{n} = \frac{(n+1)(2n+1)}{6} = \frac{21 \times 41}{6\,_2} = \frac{287}{2} = 143.5$$

Q) What is the mean of the squares of the first 20 natural numbers ?

(a)   151.5   (b)   143.5
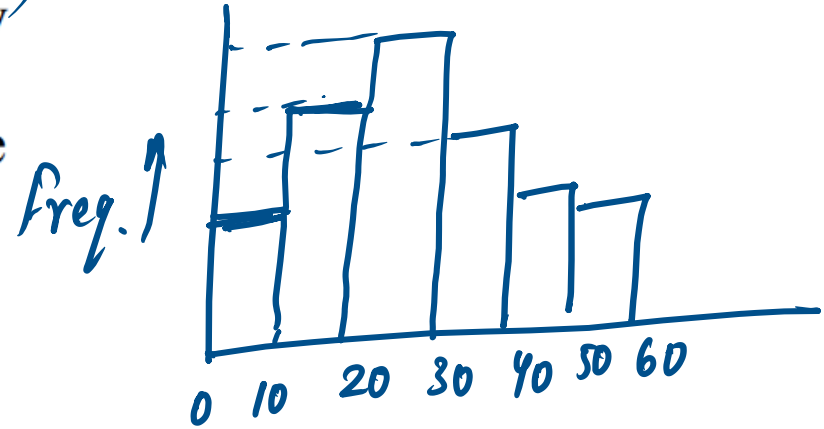(c)   65   (d)   72

Ans: (b)

Q) Which one of the following statements is not correct with
reference to a histogram?
  (a) Frequency curve is obtained by joining the mid-points
      of the top of the adjacent rectangles with smooth curves ✓
  (b) Histogram is drawn for continuous data ✓ (intervals)
  (c) The height of the bar is proportional to the frequency
      of that class ✓
  (d) Mode of the distribution can be obtained from the
      histogram ✗

freq. ↑

0 10 20 30 40 50 60

Q) Which one of the following statements is not correct with reference to a histogram?

(a) Frequency curve is obtained by joining the mid-points of the top of the adjacent rectangles with smooth curves

(b) Histogram is drawn for continuous data

(c) The height of the bar is proportional to the frequency of that class

(d) Mode of the distribution can be obtained from the histogram

Ans: (d)

Q) Consider the following statements in respect of a histogram:

I. The histogram consists of vertical rectangular bars with a common base such that there is no gap between consecutive bars.

II. The height of the rectangle is determined by the frequency of the class it represents.

Which of the statements given above is/are correct?

(a) Only I
(b) Only II
(c) Both I and II
(d) Neither I nor II

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I. The histogram consists of vertical rectangular bars with a common base such that there is no gap between consecutive bars.

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Which of the statements given above is/are correct?

(a) Only I
(b) Only II
(c) Both I and II
(d) Neither I nor II

Ans: (c)

Q) The arithmetic mean of 10 numbers was computed as 7.6. It was later discovered that a number 8 was wrongly read as 3 during the computation. What should be the correct mean?

(a) 7.1   (b) 7.6

(c) 8.1   (d) 8.6

$$\text{Total} = 7.6 \times 10 = 76$$

$$\frac{76 - 3 + 8}{10} = \frac{81}{10} = 8.1$$

$$\text{New mean} = \frac{(\text{Total}) - \text{wrong value} + \text{right value}}{\text{New count}}$$

x

Q) The arithmetic mean of 10 numbers was computed as 7.6. It was later discovered that a number 8 was wrongly read as 3 during the computation. What should be the correct mean?

(a) 7.1

(b) 7.6

(c) 8.1

(d) 8.6

Ans: (c)