



CA FOUNDATION QUANTS

Chp14 Measures of Central Tendency & Dispersion

MARATHON SERIES





Plan & Approach

- Revision of all concepts from Comprehensive Book
- PYQs (Past Paper MCQs) of each topic *last 3 papers*
- Substantial Coverage of Syllabus (80+)
- Dedicated Theory hai Zaroori Live Session
- 10 Live Sessions, 2 Recorded Sessions as per Schedule



DETAILED SCHEDULE

Date	Day	Mode	Start	End	Chapters	Marks
01-Jan-26	Thu	Live	3.15 pm	5.30 pm	Math for Finance	14
02-Jan-26	Fri	Live	3.15 pm	5.30 pm	Measures of Central Tendency and Dispersion	10
03-Jan-26	Sat	Recorded	3.15 pm	5.30 pm	Blood Relations and Direction Test	10
04-Jan-26	Sun	Recorded	3.15 pm	5.30 pm	Seating Arrangements and Number Series..	10
05-Jan-26	Mon	Live	3.15 pm	5.30 pm	Correlation and Regression	5
06-Jan-26	Tue	Live	3.15 pm	5.30 pm	Index Numbers and Sequence Series	8
07-Jan-26	Wed	Live	3.15 pm	5.30 pm	Ratio Proportion Indices Logarithm	4
08-Jan-26	Thu	Live	3.15 pm	5.30 pm	Equations and Linear Inequalities	6
09-Jan-26	Fri	Live	3.15 pm	5.30 pm	Permutations and Combinations	5
10-Jan-26	Sat	Live	3.15 pm	5.30 pm	Set Relation and Functions	4
11-Jan-26	Sun	Live	3.15 pm	5.30 pm	Theory hai Zaroori Edition 2026	10
12-Jan-26	Mon	Live	3.15 pm	5.30 pm	100Marks Full Syllabus Test Live with Discussion in Session itself	

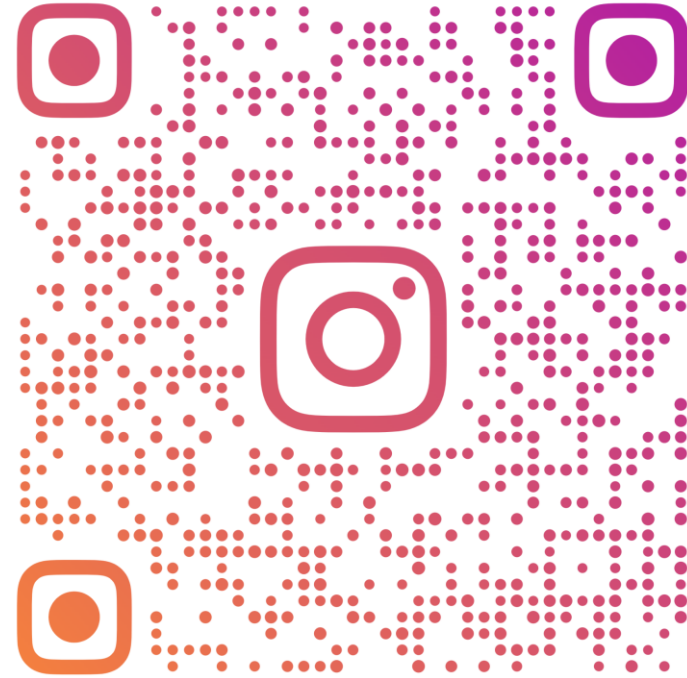


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Concepts

Central Tendency - Basics

Meaning	<ul style="list-style-type: none">Central Tendency is the tendency of a given set of observations to cluster around a single central or middle value.The single value that represents the given set of observations is described as a measure of central tendency.
Different Measures of Central Tendency	<ul style="list-style-type: none">Arithmetic Mean (AM)Median (Me)Mode (Mo)Geometric Mean (GM)Harmonic Mean (HM)
Types of Formula based Questions	<ul style="list-style-type: none">Discrete Observations 11, 13, 20, 34Simple Frequency DistributionGrouped Frequency Distribution

\underline{x}	\underline{f}	$\underline{x_m}$
0-10	2	5
10-20	4	15
20-30	3	25

\underline{x}	\underline{f}
1	1
2	1
4	3
7	2
10	9



Arithmetic Mean

Discrete Observations	$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$ $\bar{x} = \frac{\sum x}{n}$						
Frequency Distribution	$\bar{x} = \frac{\sum fx}{N}$ <table border="1"> <tr> <td>In case of simple frequency distribution</td><td>$x = \text{individual values}$</td></tr> <tr> <td>In case of grouped frequency distribution</td><td>$x = \text{mid-point of class intervals}$</td></tr> <tr> <td>$N = \text{total number of observations}$</td><td>$N = \sum f$</td></tr> </table>	In case of simple frequency distribution	$x = \text{individual values}$	In case of grouped frequency distribution	$x = \text{mid-point of class intervals}$	$N = \text{total number of observations}$	$N = \sum f$
In case of simple frequency distribution	$x = \text{individual values}$						
In case of grouped frequency distribution	$x = \text{mid-point of class intervals}$						
$N = \text{total number of observations}$	$N = \sum f$						
Assumed Mean / Step-Deviation Method	<p>AM using assumed mean / step deviation method</p> $\bar{x} = A + \frac{\sum fd}{N} \times C, \text{ where } d = \frac{x - A}{C}, A \text{ is assumed mean, } C \text{ is class length}$						
Property 1	If all the observations are constant, AM is also constant						
Property 2	the algebraic sum of deviations of a set of observations from their AM is zero						
Property 3	<p>AM is affected both due to change of origin and scale</p> <p>If $y = a + bx$ then $\bar{y} = a + b\bar{x}$</p>						
Property 4	<p>Combined AM</p> $\bar{x}_c = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1 + n_2}$						



General Review

- AM is best measure of central tendency
- AM is based on all observations
- AM is affected by sampling fluctuations
- AM is amenable to mathematical property
- AM cannot be used in case of open end classification

Below 10 } x_m
10-20 } α
20-30 }

**Median**

Discrete Observations	<ul style="list-style-type: none"> If $n = \text{odd}$, then middle term If $n = \text{even}$, average of two middle terms 			
Simple Frequency Distribution	<ul style="list-style-type: none"> First make column of less than cumulative frequency Apply same formula as discrete 			
Grouped Frequency Distribution	<i>Median in case of grouped frequency distribution</i>			
	Step 1	Prepare a less than type cumulative frequency distribution		
	Step 2	Calculate $\frac{N}{2}$ and check between which class boundaries it falls and call it as Median Class		
	Step 3	l_1	N_u	N_l
		LCB of Median Class	Cum Freq. of Median Class	Cum. Freq. of Pre-Median Class
	Step 4	Apply Formula $Me = l_1 + \left(\frac{\frac{N}{2} - N_l}{N_u - N_l} \right) \times C \quad \text{or} \quad Me = l_1 + \left(\frac{\frac{N}{2} - N_l}{f} \right) \times C$		

*modus*

Property 1	<p>For a set of observations, the sum of absolute deviations is minimum, when the deviations are taken from the median.</p> $\sum x - Me \text{ is minimum}$
Property 2	<p>Median is also affected by both change of origin and scale.</p>
General Review	<ul style="list-style-type: none">• Median is also called as positional average• Median is not based on all observations• Median is <i>lets</i> not affected by sampling fluctuations• Median is best measure of central tendency in case of open-end classification



Partition Values

Meaning

- These may be defined as *values dividing a given set of observations into number of equal parts*
- When we want to divide the given set of observations into two equal parts, we consider median, similarly there are quartiles, deciles, percentiles

Name of PV	No. of equal parts	No. of PVs	Symbol
Median	2	1	Me
Quartile	4	3	Q_1, Q_2, Q_3
Decile	10	9	D_1, D_2, \dots, D_9
Percentile	100	99	P_1, P_2, \dots, P_{99}

**Formula –
Discrete
Observations**

- Rank Calculation $(n + 1)p^{\text{th}}$ term
- Value of p depends on partition value

$$\begin{aligned} Q_3 &= (n+1) \times \frac{3}{4} \\ Q_1 &= (n+1) \times \frac{1}{4} \end{aligned}$$

D_3

#	Median	Quartile	Decile	Percentile
First	1/2	1/4	1/10	1/100
Second		2/4	2/10	2/100
...				
Last		3/4	9/10	99/100

**Quartiles
Grouped FD**

Quartiles in case of Grouped Frequency Distribution: Steps are like median with few modifications.

1 st Quartile	3 rd Quartile
Find Q_1 class using $\frac{N}{4}$	Find Q_3 class using $\frac{3N}{4}$
$Q_1 = l_1 + \left(\frac{\frac{N}{4} - N_l}{N_u - N_l} \right) \times C$	$Q_3 = l_1 + \left(\frac{\frac{3N}{4} - N_l}{N_u - N_l} \right) \times C$



Mode

Meaning	Mode is the <i>value</i> that occurs the maximum number of times		
Special Thing about Mode	<ul style="list-style-type: none">• If two or more observations are having maximum frequency then there are multiple modes [multimodal distribution]• If there are exactly two modes then distribution is called as Bimodal Distribution• If all observations are having same frequency then distribution has no mode• We can say that Mode is not rigidly defined		
Grouped Frequency Distribution	<ul style="list-style-type: none">• Find Modal Class: Class with highest frequency and obtain below values		
	f_{-1}	f_0	f_1
	frequency of pre modal class	frequency of the modal class	frequency of the post modal class
	<ul style="list-style-type: none">• Apply Formula		
	$Mo = l_1 + \left(\frac{f_0 - f_{-1}}{2f_0 - f_{-1} - f_1} \right) \times C$		



Property 1	<i>If all the observations are constant, mode is also constant</i>
Property 2	<i>Mode is also affected both due to change of origin and scale</i>
General Review	<ul style="list-style-type: none">• Mode is not based on all observations• Mode is not rigidly defined/ uniquely defined• Mode is not amenable to Mathematical Property

Relationship between Mean, Median and Mode

<i>In case of Symmetric Distribution</i>	<i>Mean = Median = Mode</i>
<i>In case of Moderately Skewed Distribution (Empirical relationship)</i>	<i>Mean – Mode = 3 (Mean – Median) OR Mode = 3 Median – 2 Mean</i>



Geometric Mean

Definition	For a given set of n positive observations , the geometric mean is defined as the n^{th} root of the product of the observations
Formula – Discrete	$G = (x_1 \times x_2 \times \dots \times x_n)^{1/n}$
Formula – Frequency Distribution	$G = (x_1^{f_1} \times x_2^{f_2} \times \dots \times x_n^{f_n})^{1/N}$
Property 1	Logarithm of G for a set of observations is the AM of the logarithm of the observations $\log G = \frac{1}{n} \sum \log x$
Property 2	If all the observations are constant, GM is also constant
Property 3	If $z = xy$, then GM of $z = \text{GM of } x \times \text{GM of } y$
Property 4	If $z = x/y$, then GM of $z = \frac{\text{GM of } x}{\text{GM of } y}$



Harmonic Mean

Definition	<i>For a given set of non-zero observations, harmonic mean is defined as the reciprocal of the AM of the reciprocals of the observation</i>
Formula – Discrete	$H = \frac{n}{\Sigma(\frac{1}{x})}$
Formula – Frequency Distribution	$H = \frac{N}{\Sigma(\frac{f}{x})}$
Property 1	<i>If all observations are constant HM is also constant</i>
Property 2	$\text{Combined HM} = \frac{n_1 + n_2}{\frac{n_1}{H_1} + \frac{n_2}{H_2}}$



Use of GM and HM

Both	Both are used for calculating average rates
GM	Appropriate for rates having percentages
HM	Appropriate for rates other than percentages

Relationship between AM, GM, and HM

Relation	Scenario	Relation
	When all the observations are same/ identical	$AM = GM = HM$
	When observations are distinct	$AM > GM > HM$
	In question is silent	$AM \geq GM \geq HM$
Special Relation	If there are only two observations : $AM \times HM = (GM)^2$	

$$AH = G^2$$



Weighted Average

When to use	If the observations are not of equal importance and we need to treat observations according to their hierarchical importance, then we use Weighted Average	
Formulas	Weighted AM	$\frac{\sum wx}{\sum w}$
	Weighted GM	$\left(x_1^{w_1} \times x_2^{w_2} \times x_3^{w_3} \times \dots \times x_n^{w_n}\right)^{\frac{1}{\sum w}}$
	Weighted HM	$\frac{\sum w}{\sum \left(\frac{w}{x}\right)}$



Measures of Dispersion

Meaning of Measure of Dispersion	<ul style="list-style-type: none">• Dispersion for a given set of observations may be defined as• the amount of deviation of the observations,• usually, from an appropriate measure of central tendency	
Types of Measure of Dispersion	Absolute Measures of Dispersion	<ul style="list-style-type: none">• These are with units• These are not useful for comparison of two variables with different units.• Example: Range, Mean Deviation, Standard Deviation, Quartile Deviation
	Relative Measures of Dispersion	<ul style="list-style-type: none">• These are unit free measures• These are useful for comparison of two variables with different units.• Example: Coefficient of Range, Coefficient of Mean Deviation, Coefficient of variation, Coefficient of Quartile Deviation



Range

Discrete – Formula	$L - S$ <p>where, L: Largest Observation, S: Smallest Observation</p>
Grouped Frequency Distribution – Formula	$\frac{L - S}{}$ <p>where, Largest Observation = UCB of last class interval, Smallest Observation = LCB of first-class interval</p>
Coefficient of Range	$\frac{L - S}{L + S} \times 100$
Property 1	<ul style="list-style-type: none">• Not affected by change of <u>origin</u>• Affected by change of scale (only value)• No impact of sign of change of scale• Note: Measure of Dispersion can never be negative
General Review	<ul style="list-style-type: none">• Not Based on All Observations• Easy to Compute

$$R_x = 10$$



Mean Deviation

Meaning	<ul style="list-style-type: none">Mean deviation is defined as thearithmetic mean of theabsolute deviations of the observationsfrom an appropriate measure of central tendency
Formula – Discrete	$MD_A = \frac{1}{n} \sum x - A $ <p>where, A = Appropriate Central Tendency Measure</p>
Formula – Frequency Distribution	$MD_A = \frac{1}{N} \sum f x - A $
Coefficient of Mean Deviation	Coefficient of Mean Deviation: $\frac{\text{Mean Deviation about } A}{A} \times 100$
Property 1	Mean Deviation takes its minimum value when deviations are taken from Median
Property 2	Change of Origin – No Affect, Change of Scale – Affect of value not sign

$$R_x = 10, \quad y = 2x + 3 \quad R_y = 2 \times 10 = 20$$
$$y = -2x + 3 \quad R_y = 2 \times 10 = 20$$



General Review

- *Based on all observations*
- *Improvement over Range*
- *Difficult to compute*
- *Not amenable to Mathematical Property because of usage of Modulus*

**Standard Deviation**

Meaning	<ul style="list-style-type: none">• Improvement over Mean Deviation• It is defined as the root mean square deviation when the deviations are <u>taken from the AM</u> of the observations
Formula – Discrete	$\sigma_x = SD_x = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$ $\sigma_x = SD_x = \sqrt{\frac{\sum x^2}{n} - (\bar{x})^2}$
Formula – Frequency Distribution	$\sigma_x = SD_x = \sqrt{\frac{\sum f(x - \bar{x})^2}{N}}$ $\sigma_x = SD_x = \sqrt{\frac{\sum fx^2}{N} - (\bar{x})^2}$
Coefficient of Variation	$\frac{SD_x}{\bar{x}} \times 100$



SD for any two numbers	$SD = \frac{\text{Range}}{2}$
SD for first n natural numbers	$s = \sqrt{\frac{n^2 - 1}{12}}$
Property 1	If all the observations are constant, SD is ZERO
Property 2	No effect of change of origin but affected by change of scale in the magnitude (ignore sign)
Property 3	$SD_c = \sqrt{\frac{n_1 s_1^2 + n_2 s_2^2 + n_1 d_1^2 + n_2 d_2^2}{n_1 + n_2}}$ $d_1 = \bar{x}_c - \bar{x}_1, d_2 = \bar{x}_c - \bar{x}_2$



Quartile Deviation

Formula	<i>semi inter quartile range</i> $QD_x = \frac{Q_3 - Q_1}{2}$
Calculation	Quartiles are calculated same as we studied in Central Tendency
Coefficient of Quartile Deviation	$\frac{Q_3 - Q_1}{Q_3 + Q_1} \times 100$
General Review	<ul style="list-style-type: none">It is the best measure of dispersion for open-end classificationIt is also less affected due to sampling fluctuationsLike other measures of Dispersion, QD is also not affected by change of origin but affected by scale ignoring sign
Relationship between SD, MD and QD	$4SD = 5MD = 6QD$ or $SD : MD : QD = 15 : 12 : 10$



PYQ Sep 2025

(21) If there are two groups with 10 and 12 observations and harmonic mean of the two groups are 3 and 5 respectively, then the combined Harmonic mean is

- a. 8.0 b. 2.0
c. ✓ 3.8 d. 4.0

$$n_1 = 10 \quad n_2 = 12$$

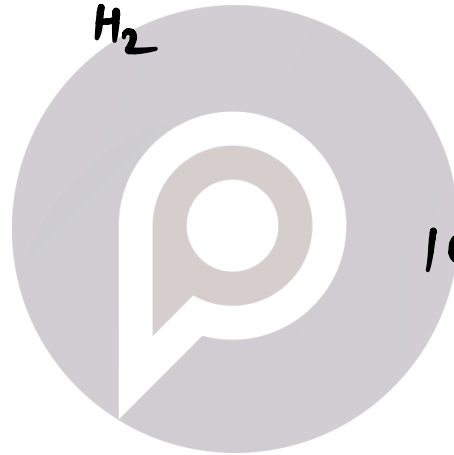
$$H_1 = 3 \quad H_2 = 5$$

$$H_c = \frac{n_1 + n_2}{\frac{n_1}{H_1} + \frac{n_2}{H_2}}$$

$$\frac{10+12}{\frac{10}{3} + \frac{12}{5}}$$

$$10 \div 3 + 12 \div 5 + \text{MRC} \div = \times 22$$

$$\underline{\underline{3.837}}$$

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PYQ Sep 2025

(22) Best measure of Dispersion for open-end classification is the QD, which does not change with the change of origin.

- a. Quartile Deviation, Scale
- b. Standard Deviation, Scale
- c. ☒ Quartile Deviation, Origin
- d. Standard Deviation, Origin



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PYQ Sep 2025

(23) Coefficient of range of 84, 93, 53, 70, 82, 65 is

a. 28.38

✓ b. 27.39

c. 26.75

d. 29.31

 $L = 93$ $S = 53$

$$\text{co. of range} = \frac{L-S}{L+S} \times 100$$

$$= \frac{93-53}{93+53} \times 100 = \frac{40}{146} \times 100 = 27.39$$

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PYQ Sep 2025

(24) Calculate the Harmonic Mean of 1, $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{9}$.

a. 2.48

✓ b. 0.21

c. 0.31

d. 0.25

$$1, \frac{1}{3}, \frac{1}{6}, \frac{1}{9}$$

$$HM = \frac{n}{\sum(1/x)} = \frac{4}{1+3+6+9} = \frac{4}{19} = 0.21$$



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PYQ Sep 2025

(25) If X and Y are related by $4X + 3Y + 5 = 0$ and Mean of X is 10, then the Mean of Y is

a. -23

✓ b. -15

c. -20

d. 23

$$4X + 3Y + 5 = 0$$

$$\bar{X} = 10, \bar{Y} = ?$$

$$4(10) + 3\bar{Y} + 5 = 0$$

$$3\bar{Y} + 45 = 0$$

$$3\bar{Y} = -45$$

$$\bar{Y} = -15$$

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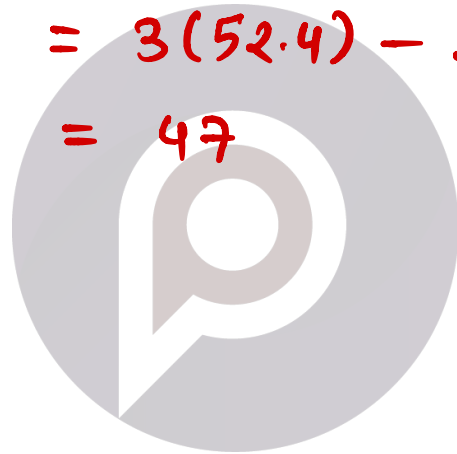
(26) For a moderately skewed distribution of marks in English for a group of 145 students the mean marks and median marks were found to be 55.10 and 52.40, respectively. The modal marks are

- | | |
|---------|---------|
| a. ✓ 47 | b. 42 |
| c. 53.1 | d. 52.2 |

$$\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$$

$$= 3(52.4) - 2 \times 55.10$$

$$= 47$$



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(27) If the sum of ten values is 20 and sum of squares of these values is 80, then the standard deviation is _____.

- a. 1 ✓ b. 2
 c. 1/2 d. 4

$$\Sigma x = 20 \quad n = 10 \quad \Sigma x^2 = 80 \quad , \quad SD = ?$$

$$SD = \sqrt{\frac{\sum x^2}{n} - \bar{x}^2} = \sqrt{\frac{80}{10} - \left(\frac{20}{10}\right)^2}$$

$$= \sqrt{8 - 4}$$

$$= \underline{\underline{2}}$$



PYQ Sep 2025

(28) A data set has first eleven positive multiples of 6. The semi inter-quartile range is _____.

a. 12

b. 24

c. ✓ 18

d. 36

$x \rightarrow 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66$ ($n=11$)

$$QD = ? \quad \frac{Q_3 - Q_1}{2}$$

Cal of Q_3

$$\text{Rank} = (n+1) \times \frac{3}{4} = (11+1) \times \frac{3}{4} = 9^{\text{th}} \text{ term}$$

$$Q_3 = 54$$

Cal of Q_1 Rank = $(n+1) \times \frac{1}{4}$
 $= 12 \times \frac{1}{4} = 3^{\text{rd}}$

$$Q_1 = 18$$

$$QD = \frac{54 - 18}{2} = 18$$



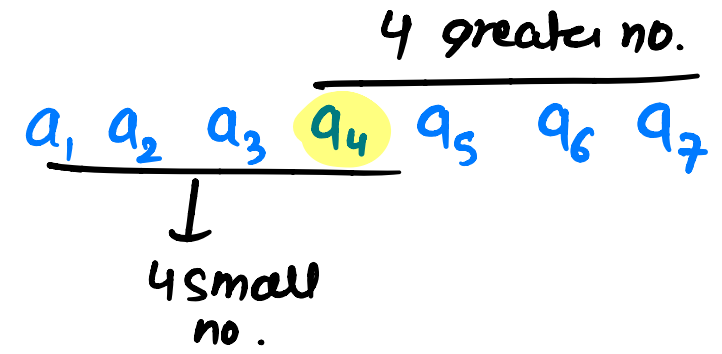
PYQ Sep 2025

(32) A set contains seven numbers whose average is 12. The average of four greater numbers is 18 and the average of four smaller numbers is 8. Which of the followings is the value of one of the numbers?

a. 12

b. 16

c. 18

d. ☒ 20

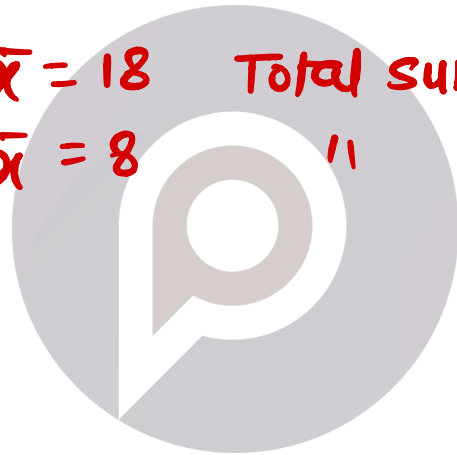
$$72 + 32 = 104$$

$$\begin{array}{r} 104 \\ - 84 \\ \hline 20 \\ \hline \end{array}$$

$$n = 7, \bar{x} = 12 \quad \text{Total sum} = 12 \times 7 = 84$$

$$n = 4, \bar{x} = 18 \quad \text{Total sum of 4 great no.} = 18 \times 4 = 72$$

$$n = 4, \bar{x} = 8 \quad \text{4 smaller no.} = 8 \times 4 = 32$$

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PYQ May 2025

(45) A helicopter flies from A to B at the rate of 500 km/hr. and comes back at the rate 700 km/hr.

The average speed of the helicopter is

- a. 600 km/hr km/hr ✓ b. 583.33 km/hr km/hr
c. $100\sqrt{35}$ d. 620 km/hr km/hr
km/hr

avg → speed
rate
other than %
HM suitable

$$n = 2$$

$$\frac{2}{\frac{1}{500} + \frac{1}{700}} = 583.33$$

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PYQ May 2025

(46) If Arithmetic Mean (A.M.) and Geometric Mean (G.M.) of two numbers are 6.50 and 6 respectively, then the two numbers are

- a. 6 and 7 ~~X~~ ~~b.~~ 9 and 4
c. 10 and 3 d. 8 and 5

a) $\frac{6+7}{2} = 6.5, \sqrt{6 \times 7} = 6.48$

b) $\frac{9+4}{2} = 6.5, \sqrt{9 \times 4} = 6$



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PYQ May 2025

(47) Which of the following is not a method of dispersion?

a. SD

b. MD

c. Range

d. ~~Concurrent~~
deviation

correlation
=



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PYQ May 2025

(48) Find out co-efficient of variation, if $N = 14$, Σfx
 $= 280$ and σ (S.D.) $= 3$.

a. 20

✓ b. 15

c. 4.67

d. Zero

$$\text{co. of variation} = \frac{SD}{AM} \times 100$$

$$= \frac{3}{20} \times 100 = 15$$

 AM
 $=$

$$\begin{aligned} & \frac{\Sigma fx}{N} \\ &= \frac{280}{14} \\ &= 20 \end{aligned}$$

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PYQ May 2025

(49) The monthly profit/loss for six months of the firm is as under:

Month	Profit/ Loss in ₹
Jan	1,000
Feb	900
Mar	0
Apr	-200
May	-400 (S)
Jun	2,000 (L)

The coefficient of range of the above data is

- a. 122 ✓ b. 150
c. 33.33 d. 55.55

$$\frac{L-S}{L+S} \times 100$$

$$\frac{2000 - (-400)}{2000 + (-400)} \times 100$$

$$\frac{2400}{1600} \times 100 = 150$$



PYQ May 2025

(51) If the mean of the following frequency distribution is 2.6, then the value of Y is

X (marks)	1	2	3	4	5
No. of students (f)	8	10	Y	2	4

24+Y

a. ✓ 16

b. 6

c. 26

d. 12

$$\frac{\sum fx}{N} = 2.6$$

$$\frac{8 \times 1 + 10 \times 2 + Y \times 3 + 2 \times 4 + 4 \times 5}{24 + Y} = 2.6$$

$$\frac{56 + 3Y}{24 + Y} = 2.6 \Rightarrow 56 + 3Y = 62.4 + 2.6Y$$
$$0.4Y = 6.4$$

$$Y = 16$$



PYQ May 2025

(52) Which one of the following measures of central tendency is based on only fifty percent (50%) of the central values?

- | | |
|---|---------|
| a. GM | b. HM |
| <input checked="" type="checkbox"/> c. Median | d. Mode |



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(53) The Arithmetic Mean (A.M.) and mode of the data are 32 and 26, respectively, then find the median of the data.

a✓ 30

b. 12

c. 6

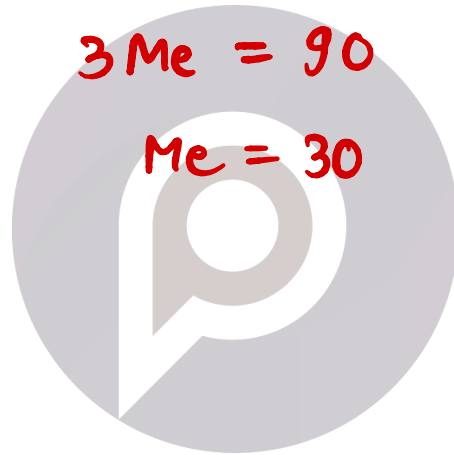
d. 32

$$\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$$

$$26 = 3 \text{ Median} - 2 \times 32$$

$$3 \text{ Me} = 90$$

$$\text{Me} = 30$$



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PYQ May 2025

(54) Find out the mode from the following data:
100, 110, 125, 225, 325, 125, 90, 80, 455, 375,
125

a. 325

b. 110

c. 455

☒ d. 125



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PYQ May 2025

(55) Which one of the following is the **absolute measure of dispersion for open ended distributions?**

a. Range

b. SD

c. MD

~~d. QD~~



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PYQ Jan 2025

- (3) The mean of three numbers is 135. Among the three numbers the biggest number is 180. The difference between the remaining two numbers is 25. Then the smallest number is

a. 130

b. 125

c. 120

✓d. 100

let smallest no. be a

biggest no. is 180

so middle no. is $a+25$

$$\frac{a + (a+25) + 180}{3} = 135$$

3

$$2a + 205 = 405$$

$$\underline{a = 100}$$

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PYQ Jan 2025

(11) Mean deviation is minimum when the deviations are taken from the median.

- | | |
|------------|--|
| a. Maximum | b. <input checked="" type="checkbox"/> Minimum |
| c. Zero | d. Cant Say |



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(12) If x and y are related as $4x + 2y + 12 = 0$ and mean deviation of x is 4.5, then the mean deviation of y is

- a. -9 ✓ b. 9
c. 1.1 d. 4.5

MD is Measure of disp so only affected by change of scale

$$4x + 2y + 12 = 0$$

$$2y = -12 - 4x$$

$$y = -\frac{12}{2} - \frac{4x}{2}$$

$$\begin{aligned} MD_y &= \frac{4}{2} MD_x = 2 \times MD_x \\ &= 2 \times 4.5 \\ &= 9 \end{aligned}$$



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(13) For a distribution the mean is 30. The standard deviation is 2, then coefficient of variation is

- ☒ a. 6.67% b. 9.45%
c. 7.5% d. 2.5%

$$\text{co. of var} = \frac{SD}{AM} \times 100$$

$$= \frac{2}{30} \times 100 = 6.67\%$$



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(15) The algebraic sum of deviation of set of observations from their arithmetic mean is

a. $\frac{\sum x_i}{n}$

b. $\sqrt{\frac{(\sum x_i - \bar{x})^2}{n-1}}$

c. $\frac{\sum x_i}{n-1}$

d. ✓ Zero



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(16) Find the Harmonic Mean of 2, 4 & 6.

~~a.~~

3.30

b. 3.00

c.

3.75

d. 4.00

$$\frac{3}{\frac{1}{2} + \frac{1}{4} + \frac{1}{6}} = \underline{\underline{3.27}}$$



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(17) If the mode of the following data is 13, then the value of x in the data set is 13, 8, 6, 3, 8, 13, $2x+3$, 8, 13, 3, 5, 7

a. 6

✓ b. 5

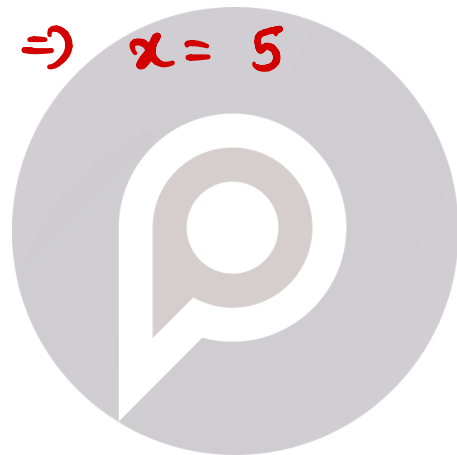
c. 7

d. 8

if mode is 13 then freq of 13 should be 3

$$\Rightarrow 2x+3 = 13$$

$$\Rightarrow x = 5$$



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(18) *The best measure of central tendency is*

- | | | |
|------------|-------------|------------------|
| <i>a ✓</i> | <i>Mean</i> | <i>b. Median</i> |
| <i>c.</i> | <i>Mode</i> | <i>d. Range</i> |



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(23) The standard deviation of the data 2, 4, 5, 6, 8, 17 is 23.33, then the standard deviation of the data 4, 8, 10, 12, 16, 34 is

- a. 23.33 ✓ b. 46.66
c. 12.23 d. 0

here all original obs are multiplied by 2

so new SD = 2 x old SD

$$= 2 \times 23.33$$

$$= 46.66$$



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(24) The values of the first quartile and third quartile are 36.50 and 57.50. Then the semi-inter-quartile range is

a. 47.50

b. 12.50

c. ✓ 10.50

d. 11.50

$$\text{semi inter qrt range} = \frac{Q_3 - Q_1}{2}$$

$$= \frac{57.50 - 36.50}{2}$$

$$= 10.5$$

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(25) The AM & GM for two observations are 8 and 2. Find the values of two observations.

- a. ☒ 15.75, 0.25 b. 16, 1
c. 15, 1 d. 14.75, 1.75

$$a) \frac{15.75 + 0.25}{2} = 8 \quad \sqrt{15.75 \times 0.25} = 1.984 \sim 2$$



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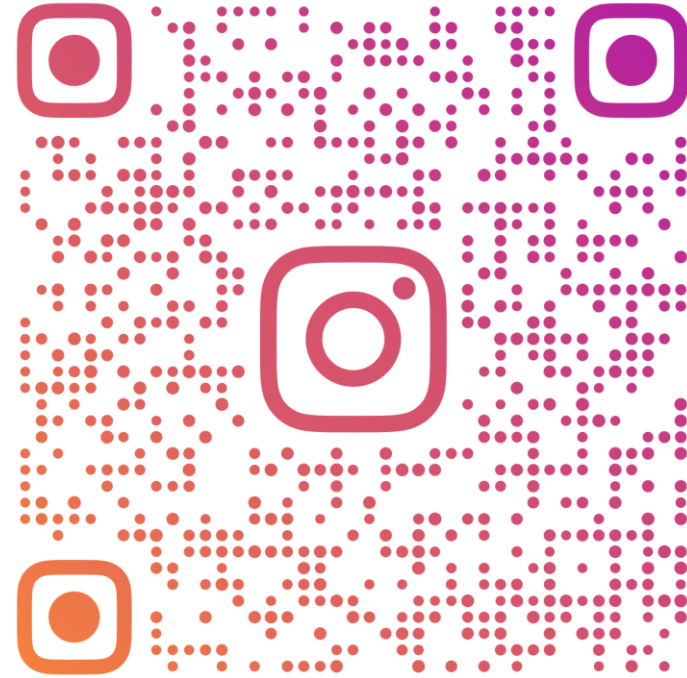


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