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JEE MAIN STATISTICS — VARIANCE AND STANDARD DEVIATION — PYQS

Max. Marks: 64 **Questions:** 16

Section A (MCQ) — 15 questions

Q.1 A set of four observations has mean 1 and variance 13. Another set of six observations has mean 2 and variance 1. Then, the variance of all these 10 observations is equal to :

[JEE Main 2026 (Online) 8th April Evening Shift]

(1) 5.96 (2) 6.14 (3) 6.04 (4) 6.24

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Q.2 A data consists of 20 observations $x_1, x_2, \ldots, x_{20}$. If $\sum_{i=1}^{20}(x_i+5)^2 = 2500$ and $\sum_{i=1}^{20}(x_i-5)^2 = 100$, then the ratio of mean to standard deviation of this data is :

[JEE Main 2026 (Online) 6th April Morning Shift]

(1) 2 : 1 (2) 3 : 1 (3) 3 : 2 (4) 4 : 1

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Q.3 Let the mean and the variance of seven observations 2, 4, α, 8, β, 12, 14, α < β, be 8 and 16 respectively. Then the quadratic equation whose roots are 3α + 2 and 2β + 1 is :

[JEE Main 2026 (Online) 6th April Evening Shift]

(1) $x^2 - 35x + 306 = 0$ (2) $x^2 - 41x + 420 = 0$

(3) $x^2 - 45x + 506 = 0$ (4) $x^2 - 37x + 342 = 0$

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Q.4 For 10 observations $x_1, x_2, \ldots, x_{10}$, if $\sum_{i=1}^{10}(x_i+2)^2 = 180$ and $\sum_{i=1}^{10}(x_i-1)^2 = 90$, then their standard deviation is :

[JEE Main 2026 (Online) 4th April Evening Shift]

(1) 2 (2) $\sqrt{3}$ (3) $2\sqrt{2}$ (4) 3

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Q.5 The mean and variance of n observations are 8 and 16, respectively. If the sum of the first (n–1) observations is 48 and the sum of squares of the first (n–1) observations is 496, then the value of n is :

[JEE Main 2026 (Online) 2nd April Evening Shift]

(1) 21 (2) 16 (3) 13 (4) 7

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Q.6 The mean and variance of a data of 10 observations are 10 and 2, respectively. If an observation α in this data is replaced by β, then the mean and variance become 10.1 and 1.99, respectively. Then α + β equals

[JEE Main 2026 (Online) 24th January Morning Shift]

(1) 15 (2) 10 (3) 5 (4) 20

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Q.7 Let $X = \{x \in \mathbb{N} : 1 \le x \le 19\}$ and for some $a, b \in R$, $Y = \{ax + b : x \in X\}$. If the mean and variance of the elements of Y are 30 and 750, respectively, then the sum of all possible values of b is

[JEE Main 2026 (Online) 24th January Evening Shift]

(1) 20 (2) 100 (3) 80 (4) 60

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Q.8 Let the mean and variance of 8 numbers −10, −7, −1, x, y, 9, 2, 16 be $\frac{7}{2}$ and $\frac{293}{4}$, respectively. Then the mean of 4 numbers x, y, x + y + 1, |x − y| is : [JEE Main 2026 (Online) 23rd January Morning Shift]

(1) 11 (2) 9 (3) 10 (4) 12

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Q.9 If the mean and the variance of the data

Class	4 − 8	8 − 12	12 − 16	16 − 20
Frequency	3	λ	4	7

are μ and 19 respectively, then the value of λ + μ is :

[JEE Main 2026 (Online) 23rd January Evening Shift]

(1) 21 (2) 19 (3) 18 (4) 20

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Q.10 Let the mean and variance of 7 observations 2, 4, 10, x, 12, 14, y, x > y, be 8 and 16 respectively. Two numbers are chosen from {1, 2, 3, x − 4, y, 5} one after another without replacement, then the probability, that the smaller number among the two chosen numbers is less than 4, is :

[JEE Main 2026 (Online) 21st January Morning Shift]

(1) $\frac{4}{5}$ (2) $\frac{3}{5}$ (3) $\frac{2}{5}$ (4) $\frac{1}{3}$

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Q.11 The mean and standard deviation of 100 observations are 40 and 5.1, respectively. By mistake one observation is taken as 50 instead of 40. If the correct mean and the correct standard deviation are μ and σ respectively, then 10(μ + σ) is equal to [JEE Main 2025 (Online) 7th April Morning Shift]

(1) 447 (2) 445 (3) 449 (4) 451

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Q.12 Let the Mean and Variance of five observations $x_1 = 1$, $x_2 = 3$, $x_3 = a$, $x_4 = 7$ and $x_5 = b$, $a > b$, be 5 and 10 respectively. Then the Variance of the observations $n + x_n$, n = 1, 2, …, 5 is

[JEE Main 2025 (Online) 3rd April Evening Shift]

(1) 17 (2) 16 (3) 16.4 (4) 17.4

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Q.13 If the mean and the variance of 6, 4, a, 8, b, 12, 10, 13 are 9 and 9.25 respectively, then a + b + ab is equal to :

[JEE Main 2025 (Online) 2nd April Evening Shift]

(1) 103 (2) 106 (3) 100 (4) 105

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Q.14 Let $x_1, x_2, \ldots, x_{10}$ be ten observations such that $\sum_{i=1}^{10}(x_i - 2) = 30$, $\sum_{i=1}^{10}(x_i - \beta)^2 = 98$, $\beta > 2$, and their variance is $\frac{4}{5}$. If μ and σ^2 are respectively the mean and the variance of $2(x_1 - 1) + 4\beta$, $2(x_2 - 1) + 4\beta$, …, $2(x_{10} - 1) + 4\beta$, then $\frac{\beta\mu}{\sigma^2}$ is equal to :

[JEE Main 2025 (Online) 29th January Morning Shift]

(1) 100 (2) 90 (3) 120 (4) 110

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Q.15 For a statistical data $x_1, x_2, \ldots, x_{10}$ of 10 values, a student obtained the mean as 5.5 and $\sum_{i=1}^{10} x_i^2 = 371$. He later found that he had noted two values in the data incorrectly as 4 and 5, instead of the correct values 6 and 8, respectively. The variance of the corrected data is

[JEE Main 2025 (Online) 24th January Morning Shift]

(1) 5 (2) 7 (3) 9 (4) 4

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Section B (Numerical) — 1 question

Q.16 The variance of the numbers 8, 21, 34, 47, …, 320 is _____.

[JEE Main 2025 (Online) 23rd January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 15 questions

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**3**	**2**	**2**	**4**	**4**	**4**	**4**	**1**	**2**	**1**	**3**
Ques.	12	13	14	15							
Ans.	**2**	**1**	**1**	**2**							

Section B (Numerical) — 1 question

Ques.	16						
Ans.	**8788**						