JEE Mains & Advanced Past Years Questions

JEE-MAIN
PREVIOUS YEARS

1. If the standard deviation of the number 2, 3, a and 11 is 3.5, then which of the following is true? [*JEE Main-2016*]
   (*a*) $3a^2 - 26a + 55 = 0$ (*b*) $3a^2 - 32a + 84 = 0$
   (*c*) $3a^2 - 34a + 91 = 0$ (*d*) $3a^2 - 23a + 44 = 0$

2. If $\sum_{i=1}^{9}(x_i - 5) = 9$ and $\sum_{i=1}^{9}(x_i - 5)^2 = 45$, then the standard deviation of the 9 items $x_1, x_2 \ldots x_9$ is- [*JEE Main-2018*]
   (*a*) 4 (*b*) 2
   (*c*) 3 (*d*) 9

3. 5 students of a class have an average height 150 cm and variance 18 cm^2. A new student, whose height is 156 cm, joined them. The variance (in cm^2) of the height of these six students is: [*JEE Main-2019 (January)*]
   (*a*) 16 (*b*) 22
   (*c*) 20 (*d*) 18

4. A data consists of n observations : $x_1, x_2, \ldots x_n$. If $\sum_{i=1}^{n}(x_i + 1)^2 = 9n$ and $\sum_{i=1}^{n}(x_i - 1)^2 = 5n$, then the standard deviation of this data is: [*JEE Main-2019 (January)*]
   (*a*) 5 (*b*) $\sqrt{5}$
   (*c*) $\sqrt{7}$ (*d*) 2

5. The mean of five observations is 5 and their variance is 9.20. If three of the given five observations are 1, 3 and 8, then a ratio of other two observations is:

[JEE Main-2019 (January)]

(a) 10 : 3 (b) 4 : 9

(c) 5 : 8 (d) 6 : 7

6. If mean and standard deviation of 5 observations x_1, x_2, x_3, x_4, x_5 are 10 and 3, respectively, then the variance of 6 observations $x_1, x_2, ..., x_5$ and -50 is equal to

[JEE Main-2019 (January)]

(a) 509.5 (b) 586.5

(c) 582.5 (d) 507.5

7. A bag contains 30 white balls and 10 red balls. 16 balls are drawn one by one randomly from the bag with replacement. If X be the number of white balls drawn, then $\left(\frac{\text{mean of } X}{\text{standard deviation of } X}\right)$ is equal to:

[JEE Main-2019 (January)]

(a) 4 (b) $4\sqrt{3}$

(c) $3\sqrt{2}$ (d) $\frac{4\sqrt{3}}{3}$

8. If the sum of the deviations of 50 observations from 30 is 50, then the mean of these observations is:

[JEE Main-2019 (January)]

(a) 30 (b) 51

(c) 50 (d) 31

9. The mean and the variance of five observations are 4 and 5.20, respectively. If three of the observations are 3, 4 and 4; then the absolute value of the difference of the other two observations, is: [JEE Main-2019 (January)]

(a) 7 (b) 5

(c) 1 (d) 3

10. The mean and variance of seven observations are 8 and 16, respectively. If 5 of the observations are 2, 4, 10, 12, 14, then the product of the remaining two observations is: [JEE Main-2019 (April)]

(a) 40 (b) 49

(c) 48 (d) 45

11. A student scores the following marks in five tests : 45, 54, 41, 57, 43. His score is not known for the sixth test. If the mean score is 48 in the six tests, then the standard deviation of the marks in six tests is [JEE Main-2019 (April)]

(a) $\frac{10}{\sqrt{3}}$ (b) $\frac{100}{\sqrt{3}}$

(c) $\frac{100}{3}$ (d) $\frac{10}{3}$

12. If the standard deviation of the numbers $-1, 0, 1, k$ is $\sqrt{5}$ where $k > 0$, then k is equal to [JEE Main-2019 (April)]

(a) $2\sqrt{\frac{10}{3}}$ (b) $2\sqrt{6}$

(c) $4\sqrt{\frac{5}{3}}$ (d) $\sqrt{6}$

13. The mean and the median of the following ten numbers in increasing order 10, 22, 26, 29, 34, x, 42, 67, 70, y are 42 and 35 respectively, then $\frac{y}{x}$ is equal to:-

[JEE Main-2019 (April)]

(a) $\frac{7}{3}$ (b) $\frac{9}{4}$

(c) $\frac{7}{2}$ (d) $\frac{8}{3}$

14. If for some $x \in R$, the frequency distribution of the marks obtained by 20 students in a test is: [JEE Main-2019 (April)]

Marks	2	3	5	7
Frequency	$(x+1)^2$	$2x-5$	x^2-3x	x

then the mean of the marks is :

(a) 2.8 (b) 3.2

(c) 3.0 (d) 2.5

15. If both the mean and the standard deviation of 50 observations $x_1, x_2, ..., x_{50}$ are equal to 16, then the mean of $(x_1-4)^2, (x_2-4)^2 ..... (x_{50}-4)^2$ is:

[JEE Main-2019 (April)]

(a) 525 (b) 380

(c) 480 (d) 400

16. If the data $x_1, x_2, ..., x_{10}$ is such that the mean of first four of these is 11, the mean of the remaining six is 16 and the sum of squares of all these is 2,000; then the standard deviation of this data is: [JEE Main-2019 (April)]

(a) 4 (b) 2

(c) $\sqrt{2}$ (d) $2\sqrt{2}$

17. If the variance of the first n natural numbers is 10 and the variance of the first m even natural numbers is 16, then $(m + n)$ is equal to _____. [JEE Main-2020 (January)]

18. If the mean and variance of eight numbers 3, 7, 9, 12, 13, 20, x and y be 10 and 25 respectively, then $x.y$ is equal to _____. [JEE Main-2020 (January)]

19. The mean and the standard deviation (s.d.) of 10 observations are 20 and 2 respectively. Each of these 10 observations is multiplied by p and then reduced by q, where $p \neq 0$ and $q \neq 0$. If the new mean and new s.d. become half of their original values, then q is equal to

[JEE Main-2020 (January)]

(a) -20 (b) 10

(c) -10 (d) -5

20. The mean and variance of 20 observations are found to be 10 and 4, respectively. On rechecking, it was found that an observation 9 was incorrect and the correct observation was 11. Then the correct variance is:

[*JEE Main-2020 (January)*]

(*a*) 3.99 (*b*) 4.02

(*c*) 4.01 (*d*) 3.98

21. Let the observations $x_i (1 \le i \le 10)$ satisfy the equations, $\sum_{i=1}^{10}(x_i - 5) = 10$ and $\sum_{i=1}^{10}(x_i - 5)^2 = 40$. If μ and λ are the mean and the variance of the observations, $x_1 - 3, x_2 - 3, \ldots\ldots x_{10} - 3$, then the ordered pair (μ, λ) is equal to: [*JEE Main-2020 (January)*]

(*a*) (3, 3) (*b*) (3, 6)

(*c*) (6, 6) (*d*) (6, 3)

22. If the variance of the terms in an increasing *A.P.*, $b_1, b_2, b_3, \ldots, b_{11}$ is 90, then the common difference of this *A.P.* is _____. [*JEE Main-2020 (September)*]

23. Let $X = \{x \in N : 1 \le x \le 17\}$ and $Y\{ax + b : x \in X\}$ and $a, b \in R, a > 0\}$. If mean and variance of elements of Y are 17 and 216 respectively then $a + b$ is equal to :

[*JEE Main-2020 (September)*]

(*a*) 7 (*b*) –27

(*c*) 9 (*d*) –7

24. Let x_i $(1 \le i \le 10)$ be ten observations of a random variable X. If $\sum_{i=1}^{10}(x_i - p) = 3$ and $\sum_{i=1}^{10}(x_i - p)^2 = 9$ where $p \neq 0$ $p \in R$, then the standard deviation of these observations is [*JEE Main-2020 (September)*]

(*a*) $\frac{7}{10}$ (*b*) $\frac{9}{10}$

(*c*) $\sqrt{\frac{3}{5}}$ (*d*) $\frac{4}{5}$

25. For the frequency distribution :

[*JEE Main-2020 (September)*]

Variate (x) : $x_1 x_2 x_3 \ldots x_{15}$

Frequency (f) : $f_1 f_2 f_3 \ldots f_{15}$

Where $0 < x_1 < x_2 < x_3 < \ldots\ldots < x_{15} = 10$ and

$\sum_{i=1}^{15} f_i > 0$, then standard deviation cannot be :

(*a*) 1 (*b*) 6

(*c*) 2 (*d*) 4

26. If the variance of the following frequency distribution:

[*JEE Main-2020 (September)*]

Class :	10 - 20	20 - 30	30 - 40
Frequency :	2	x	2

is 50, then x is equal to _____.

27. The mean and variance of 8 observations are 10 and 13. 5, respectively. If 6 of these observations are 5, 7. 10, 12, 14, 15, then the absolute difference of the remaining two observations is: [*JEE Main-2020 (September)*]

(*a*) 9 (*b*) 3

(*c*) 7 (*d*) 5

28. If the mean and the standard deviation of the data 3, 5, 7, a, b are 5 and 2 respectively, then a and b are the roots of the equation: [*JEE Main-2020 (September)*]

(*a*) $x^2 - 20x + 18 = 0$

(*b*) $2x^2 - 20x + 19 = 0$

(*c*) $x^2 - 10x + 18 = 0$

(*d*) $x^2 - 10x + 19 = 0$

29. The mean and variance of 7 observations are 8 and 16, respectively. If five observations are 2, 4, 10, 12, 14, then the absolute difference of the remaining two observations is: [*JEE Main-2020 (September)*]

(*a*) 2 (*b*) 4

(*c*) 3 (*d*) 1

30. Consider the data on x taking the values 0, 2, 4, 8, ..., 2^n with frequencies ${}^nC_0, {}^nC_1, {}^nC_2, \ldots, {}^nC_n$ respectively. If the mean of this data is $n\,\frac{728}{2^n}$ then n is equal to _____. [*JEE Main-2020 (September)*]

31. If $\sum_{i=1}^{n}(x_i - a) = n$ and $\sum_{i=1}^{n}(x_i - a)^2 = na, (n, a > 1)$

Then the standard deviation of n observations $x_1, x_2, \ldots\ldots x_n$ is : [*JEE Main-2020 (September)*]

(*a*) $a - 1$ (*b*) $n\sqrt{a-1}$

(*c*) $\sqrt{n(a-1)}$ (*d*) $\sqrt{a-1}$

32. Consider three observations a, b and c such that $b = a + c$. If the standard deviation of $a + 2b + 2, c + 2$ is d, then which of the following is true? [*JEE Main-2021*]

(*a*) $b^2 = 3(a^2 + c^2) + 9d^2$

(*b*) $b^2 = a^2 + c^2 + 3d^2$

(*c*) $b^2 = 3(a^2 + c^2 + d^2)$

(*d*) $b^2 = 3(a^2 + c^2) - 9d^2$

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1. (*a*)	**2.** (*a*)	**3.** (*c*)	**4.** (*b*)	**5.** (*c*)	**6.** (*d*)	**7.** (*b*)	**8.** (*d*)	**9.** (*a*)	**10.** (*c*)	**11.** (*a*)	**12.** (*b*)
13. (*a*)	**14.** (*a*)	**15.** (*d*)	**16.** (*b*)	**17.** [18]	**18.** [54]	**19.** (*a*)	**20.** (*a*)	**21.** (*a*)	**22.** [3]	**23.** (*d*)	**24.** (*b*)
25. (*b*)	**26.** [4]	**27.** (*c*)	**28.** (*d*)	**29.** (*a*)	**30.** [06]	**31.** (*d*)	**32.** (*d*)				