



RAMAGYA SCHOOL, NOIDA
XI / MATHEMATICS / 2017-18
OLYMPIAD PRACTICE WORKSHEET

(Concept Based)

1. The coefficients of 9th, 10th and 11th terms in the expansion $(1 + x)^n$ are in A. P., then n is
(A) 7 (B) 7 or 14 (C) 14 (D) 21
2. The value of $1 + 1.1! + 2. 2! + 3.3! + \dots + n. n!$ is
(A) $(n + 1)! + 1$ (B) $(n - 1)! + 1$ (C) $(n + 1)! - 1$ (D) $(n + 1)!$
3. Seven persons are to be seated in a row. The probability that two particular persons sit next to each other is
(A) $1/3$ (B) $1/6$ (C) $2/7$ (D) $1/2$
4. Consider the first 10 positive integers. If we multiply each number by -1 and then add 1 to each number, the variance of the numbers so obtained is
(A) 8.25 (B) 6.5 (C) 3.87 (D) 2.87
5. Following are the marks obtained by 9 students in a mathematics test: 50, 69, 20, 33, 53, 39, 40, 65, 59
The mean deviation from the median is:
(A) 9 (B) 10.5 (C) 12.67 (D) 14.76
6. In a non-leap year, the probability of having 53 tuesdays or 53 wednesdays is
(A) $1/7$ (B) $2/7$ (C) $3/7$ (D) none of these

(Application based)

7. 6 boys and 6 girls sit in a row at random. The probability that all the girls sit together is
(A) $1/432$ (B) $12/431$ (C) $1/132$ (D) none of these
8. The sum of coefficients of $(1 + x - 3x^2)^{2134}$ is
(A) -1 (B) 1 (C) 0 (D) 22134
9. Three numbers are chosen from 1 to 20. Find the probability that they are not consecutive
(A) $186/190$ (B) $187/190$ (C) $188/190$ (D) $20/3$
10. If you roll a pair of dice, what is the probability that (at least) one of the dice is a 4 or the sum of the dice is 7?
A) $4/36$ B) $13/36$ C) $21/36$ D) $15/36$

11. Without repetition of the numbers, four digit numbers are formed with the numbers 0, 2, 3, 5. The probability of such a number divisible by 5 is

- (A) $1/5$ (B) $4/5$ (C) $1/30$ (D) $5/9$

12. Standard deviations for first 10 natural numbers is

- (A) 5.5 (B) 3.87 (C) 2.97 (D) 2.87

13. The two successive terms in the expansion of $(1 + x)^{24}$ whose coefficients are in the ratio 1:4 are

- (A) 3rd and 4th (B) 4th and 5th (C) 5th and 6th (D) 6th and 7th

(HOTS)

14. The coefficient of $a^4b^3c^2d$ in the expansion of $(a - b + c - d)^{10}$ is

- (A) 12600 (B) 16200 (C) 21600 (D) 26100

15. The mean of 100 observations is 50 and their standard deviation is 5. The sum of all squares of all the observations is

- (A) 50000 (B) 250000 (C) 252500 (D) 255000

16. Coefficient of variation of two distributions are 50 and 60, and their arithmetic means are 30 and 25 respectively. Difference of their standard deviation is

- (A) 0 (B) 1 (C) 1.5 (D) 2.5

17. The coefficient of x^n in the expansion of $(1 + x)^{2n}$ and $(1 + x)^{2n-1}$ are in the ratio.

- (A) 1 : 2 (B) 1 : 3 (C) 3 : 1 (D) 2 : 1

(Value Based)

18. In a Poisson probability distribution

- A) The mean and variance of the distribution are same (equal)
- B) The probability of success is always greater than 5
- C) The number of trials is always less than 5
- D) It always contains a contingency table

19. Which of the following is not a correct statement about probability

- A) It must have a value between 0 and 1
- B) It can be reported as a decimal or a fraction
- C) A value near 0 means that the event is not likely to occur/happens
- D) It is the collection of several experiments

20. If M and N are any two events, the probability that at least one of them occurs is

(A) $P(M) + P(N) - 2P(M \cap N)$

(B) $P(M) + P(N) - P(M \cap N)$

(C) $P(M) + P(N) + P(M \cap N)$

(D) $P(M) + P(N) + 2P(M \cap N)$