

8. If $P(A) = 0.3$, $P(B) = 0.4$, and $P(A \cap B) = 0.1$, what is $P(A \cup B)$?
- A) 0.5
B) 0.6
C) 0.7
D) 0.8
-
9. A tower casts a 40 m shadow when the angle of elevation of the Sun is 30° . The height of the tower is: ($\tan 30^\circ = 1/\sqrt{3}$)
- A) 40 m
B) $40/\sqrt{3}$ m
C) $40\sqrt{3}$ m
D) 20 m
-
10. What is the volume of a cone with radius 7 cm and height 12 cm? (Use $\pi = 22/7$)
- A) 308 cm^3
B) 462 cm^3
C) 616 cm^3
D) 1232 cm^3
-
11. If $\tan \theta = 4/3$, what is the value of $\sin \theta$?
- A) $3/5$
B) $4/5$
C) $3/4$
D) $5/4$
-
12. The polynomial $f(x) = 2x^3 - 3x^2 + 4x - 5$ evaluated at $x = 1$ gives:
- A) -2
B) 0
C) 2
D) 8
-
13. From an external point, if the distance to the centre of a circle is 13 cm and the radius is 5 cm, what is the length of the tangent?
- A) 8 cm
B) 10 cm
C) 12 cm
D) 14 cm
-
14. The standard deviation of the data set $\{2, 4, 4, 4, 5, 5, 7, 9\}$ (mean = 5) is:
- A) 1
B) 2
C) 3
D) 4
-
15. For a frequency distribution, which measure of central tendency is most affected by extreme values?
- A) Median
B) Mode
C) Mean
D) Weighted average

SCIENCE

16. If the mass of a particle is doubled while its velocity remains constant, its de Broglie wavelength ($\lambda = h/mv$):
- A) Doubles
B) Halves
C) Stays the same
D) Quadruples
-
17. An atom has a mass number of 23 and 11 protons. How many neutrons does it contain?
- A) 10
B) 11
C) 12
D) 13
-
18. If the length of a conductor doubles and its cross-sectional area halves, its resistance ($R = \rho L/A$) becomes:
- A) $2R$
B) $3R$
C) $4R$
D) $8R$

19. In the human digestive system, digestion of proteins primarily begins in the:
- A) Mouth
B) Stomach
C) Small intestine
D) Large intestine
-
20. In a genetic cross $Aa \times Aa$, what is the probability that an offspring will have the genotype Aa ?
- A) 25%
B) 50%
C) 75%
D) 100%
-
21. The force on a 0.5 m wire carrying 2 A current in a magnetic field of 0.3 T is: ($F = BIL$)
- A) 0.1 N
B) 0.2 N
C) 0.3 N
D) 0.6 N
-
22. A neutralisation reaction between an acid and a base produces:
- A) Acid + Water
B) Salt + Water
C) Base + Gas
D) Oxide + Water
-
23. What is the oxidation state of Chromium (Cr) in $K_2Cr_2O_7$? (K is +1, O is -2)
- A) +3
B) +4
C) +5
D) +6
-
24. The Doppler Effect states that when a sound source approaches an observer, the observed frequency:
- A) Decreases
B) Stays the same
C) Increases
D) Becomes zero
-
25. Faraday's Law of Electromagnetic Induction states that the induced EMF is proportional to the rate of change of:
- A) Electric field
B) Magnetic flux
C) Current
D) Resistance
-
26. In DNA, the base Adenine (A) pairs with:
- A) Cytosine
B) Guanine
C) Thymine
D) Uracil
-
27. The SI unit of radioactivity is:
- A) Curie
B) Gray
C) Sievert
D) Becquerel
-
28. If the frequency of a photon doubles, its energy $E = hf$:
- A) Halves
B) Stays the same
C) Doubles
D) Quadruples
-
29. Carbon dating uses which isotope of carbon to determine the age of ancient organic material?
- A) C-12
B) C-13
C) C-14
D) C-15
-
30. Which of the following best describes a catalyst in a chemical reaction?
- A) It is consumed by the reaction
B) It increases activation energy
C) It speeds up the reaction without being consumed
D) It decreases the yield of products

31. Find the next number: 1, 8, 27, 64, 125, 216, ___ (Pattern: perfect cubes)

- A) 300
B) 327
C) 343
D) 512

32. Complete the analogy: 6 : 222 :: 7 : ? (Pattern: $n : n^3 + n$)

- A) 343
B) 350
C) 357
D) 364

33. In a number-letter matrix, A=1, B=3, C=5, D=7 (each letter = $2 \times \text{position} - 1$). Using this pattern, what is the value of Z (Z is the 26th letter)?

- A) 49
B) 51
C) 53
D) 55

34. A study shows people who sleep more than 9 hours have worse health. The conclusion 'sleeping less is better for health' is flawed because:

- A) The study is too old
B) Correlation is confused with causation
C) The sample size was too small
D) Sleep has no relation to health

35. 7 people must be arranged in a line such that person P always comes before person Q (not necessarily adjacent). How many valid arrangements exist?

- A) 1260
B) 2520
C) 3040
D) 5040

36. What is the remainder when 2^{100} is divided by 7? (Note: powers of 2 mod 7 cycle every 3: 2,4,1,2,4,1...)

- A) 1
B) 2
C) 4
D) 6

37. Find the next term: 3, 7, 15, 31, 63, ___ (Differences: 4, 8, 16, 32...)

- A) 95
B) 111
C) 127
D) 143

38. Given: $|A|=30$, $|B|=25$, $|A \cap B|=10$. How many elements are in A but NOT in B?

- A) 15
B) 20
C) 25
D) 30

39. Three unbiased coins are tossed. What is the probability of getting AT LEAST 2 heads?

- A) $1/4$
B) $3/8$
C) $1/2$
D) $5/8$

40. Logical argument: 'All honest people tell the truth. John lied to me.' Conclusion:

- A) John is honest
B) John is not honest
C) Not all who lie are dishonest
D) Honesty is rare

ENGLISH

41. Choose the correct SYNONYM of VICARIOUS:

- A) Direct
B) Experienced at first hand
C) Experienced indirectly through another
D) Imaginary

Answer Key – Class 10 Olympiad Practice Paper

1. B	2. B	3. C	4. C	5. C	6. B	7. D	8. B	9. B	10. C
11. B	12. A	13. C	14. B	15. C	16. B	17. C	18. C	19. B	20. B
21. C	22. B	23. D	24. C	25. B	26. C	27. D	28. C	29. C	30. C
31. C	32. B	33. B	34. B	35. B	36. B	37. C	38. B	39. C	40. B
41. C	42. C	43. C	44. A	45. B	46. C	47. B	48. C	49. C	50. A

For weekly live challenges with instant rank and certificate, visit syllabax.com/olympiad/class/10