# Olympiad Foundation

**SAMPLE PAPER CLASS 11th**

OLYMPIAD FOUNDATION

SCIENCE OLYMPIAD

## Division of Marks

| S.No. | Topic/Section | No. of Question | Marks |
|---|---|---|---|
| 1 | Physics | 10 | 10 |
| 2 | Chemistry | 10 | 10 |
| 3 | Maths | 15 | 15 |
| 4 | Achiever Sections | 03 | 15 |
| | Total | 38 | 50 |

**INSTRUCTIONS :**

1. Use Blue/Black ballpoint pen only to darken the appropriate circle.
2. Mark should be dark and should completely fill the circle.
3. Dark only one circle for each entry.
4. Dark the circle in the space provided only.
5. Rough work must not be done on the answer sheet and do not use white- fluid or any rubbing material on Answer Sheet.
6. Each question carries one mark.

**TIME: 1 Hour** **M.M.: 50**

**Select the correct answer and darken your answer in the table :**

## PHYSICS

1. A conservation force is dependent only on :
   (A) Position of the objects (B) Position of the force
   (C) Both A & B (D) None of these

2. The equilibrium, the next moment acting on the body by various conservative force is _____.
   (A) Tangential (B) Parallel
   (C) Perpendicular (D) Normal

3. The force that is not one of the conservative force is :
   (A) Elastic spring force (B) Gravitational force
   (C) Frictional force (D) Electric force

4. What exactly is a conservative force conserving ?
   (A) Energy (B) Acceleration
   (C) Force (D) Velocity

5. Electron volt is a unit of -
   (A) Energy (B) Magnetic force
   (C) Potential difference (D) Charge

6. One watt hour contains how many Joules ?
   (A) 3.6 x 103 J (B) $10^{-3}$ J
   (C) 3.6 x 102 J (D) 3.6 x 108 J

7. At 4°C, the density of water is equal to :
   (A) 103 kg $m^{-3}$ (B) 10 kg $m^{-3}$
   (C) $10^{-3}$ kg $m^{-3}$ (D) $10^{-3}$ kg $m^{-3}$

8. The dimensions of kinetic energy is same as that of :
   (A) Force (B) Momentum
   (C) Work (D) Pressure

9. The surface tension of a liquid is 70 dy ne/ cm. In MKS system its value is ?
   (A) 7 x 103 N/m (B) 70 N/m
   (C) 7 x $10^{-2}$ N/m (D) 7 x 102 N/m

10. Light year is a unit of :-
    (A) Distance (B) Mass
    (C) Sunlight intensity (D) Time

## CHEMISTRY

11. Which one will have maximum of water molecule ?
    (A) 18 molecules of water
    (B) 1.8 grams of water
    (C) 18 grams of water
    (D) 18 moles of water

12. Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons ?
    (A) Pauli's exclusion Principle
    (B) Heisenberg's uncertainty Principle
    (B) Hund's rule of maximum multiplicity
    (D) Aufbar Principle

13. The first ionization enthapies of Na, Mg, Al and Si are in the order.
    (A) Na < Mg > Al < Si
    (B) Na > Mg > Al > Si
    (C) Na < Mg < Al < Si
    (D) Na > Mg > Al < Si

14. _____ is the species with the bond angle of $120^{o}$ ?
    (A) $PH_3$
    (B) $Ncl_3$
    (C) $Bcl_3$
    (D) $ClF_3$

15. The statement concerning the relation of temperature to the volume of a gas under fixed pressure was first synthesized by _____ ?
    (A) Boyle's law
    (B) Charle's law
    (C) Avogadro law
    (D) All of these

16. The volume of a gas is reduced to half from its original volume. The specific heat will be _____.
    (A) Reduce to half
    (B) Be double
    (C) Remain Constant
    (D) Increase four time

17. At equilibrium the rate of forward reaction and the rate of the reverse reaction are _____.
    (A) Equal
    (B) Changing
    (C) Different
    (D) Same

18. Which of the following elements does show this disproprotionation tendency ?
    (A) Cl
    (B) Br
    (C) F
    (D) I

19. Which of the following hydrides is electron - precise hydride ?
    (A) $B_2H_6$
    (B) $NH_3$
    (C) $CH_4$
    (D) $H_2O$

20. Good conductor of electricity and heat is :
    (A) Anthracite coke
    (B) Diamond
    (C) Graphite
    (D) Charcoal

## MATHEMATICS

21. The number of elements in the power set P(s) of the set S = [ (Q), 1, (2,3)] is :
    (A) 4 (B) 8
    (C) 2 (D) None of these

22. If A be a finite set of size n, then number of element in the power set of A X A
    (A) $2^{2n}$ (B) $2n^2$
    (C) $(2n)^2$ (D) 3n

23. If P = { 1, 3}, Q = {2, 3, 5}, find the number of relations from A to B :
    (A) $2^6 = 64$ (B) $2^4 = 16$
    (C) $2^2 = 4$ (D) $2^3 = 8$

24. Find the radian measure corresponding to 5°37' 30''.
    (A) π / 2 (B) $(\pi / 32)^r$
    (C) π / 30 (D) None of these

25. Cos x = ?
    (A) Sin (π/2 + x) (B) Sin (π - x)
    (C) Sin (π/4 + x) (D) None of these

26. What is the value of $i^4$.
    (A) -1 (B) 2
    (C) +1 (D) -2

27. $(a + b)^3$ = ?
    (A) $a^2 + b^2 + 3ab$ (B) $a^3 + b^3 + 2ab\ (a+b)$
    (C) $a^4 + b^4 + 4ab\ (a + b)$ (D) $a^3 + b^3 + 3a^2b + 3ab^2$

28. What is the distance between the points P (x,y) and Q (x2, y2) ?
    (A) $\sqrt{x^2 + y^2}$ (B) $\sqrt{x^3 + y^2\ (x- y)^2}$
    (C) $\sqrt{(x_2 - x1_)^2 + (y_2 - y_1)^2}$ (D) None of these

29. Find the slope of the line passing through the points (3, -2) and (-1,4).
    (A) -1/2 (B) -3/2
    (C) 0 (D) 1

30. When B = $\propto$ , the section is _____?
    (A) Parabola (B) Ellipse
    (C) Circle (D) Rectangular

31. Find the octant in which the points (-3,1,2) and (-3,1,-2) lie.
(A) (-3,1,2) lie first octant and (-3,1,-2) lie second
(B) (-3,1,2) lies fourth octant
(C) (-3,1,2) lie second octant and (-3,1,-2) lies in sixth octant
(D) None of these

32. The coordinates of points in XY plane are of the form _____
(A) (x, y, 1)
(B) (x, y, 0)
(C) (x, y, z)
(D) (x, y, z)

33. Find the limits : $\lim \left( \frac{x^2 + 1}{x + 100} \right)$

(A) 2/101
(B) 3/100
(C) 4/25
(D) 8/90

34. Find the mean deviation the mean for the following data :
6, 7, 10, 12, 13, 4, 8, 12
(A) 7
(B) 8
(C) 9
(D) 10

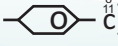
35. What is the value of C.V. (Coefficient of variation (C.V.) ?

(A) $\frac{\sigma}{x} \times 10$
(B) $\frac{\sigma}{10} \times 100$

(C) $\frac{\sigma}{x} \times 100$
(D) None of these

## ACHIEVER SECTIONS

36. A train runs along an unbacked circular track of radius 30m at a speed of 54 km/h. The mass of the train is $10^5$kg. What provides the centripetal force required for this purpose. The engine or the rails ? What is the angle of banking required to prevent wearing out of the rail ?
(A) 36.87°
(B) 80°
(C) 90°
(D) 70.18°

37. The condensation polymerization of ethylene glycol and acid ?
(A) [och2ch2 - o - c  c]
(B) nHOH2C - CH2OH
(C) nHOOC COOH
(D) None of these

38. Find real Q such that $\frac{3 + 2\,i\,\text{Sin}\,Q}{1 - 2\,i\,\text{Sin}\,Q}$ is purely real.

(A) Q = n r
(B) Q = π r
(C) Q = n π
(D) Q = 0

ANSWER KEY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | A | 11. | D | 21. | B | 31. | C |
| 2. | A | 12. | B | 22. | B | 32. | B |
| 3. | C | 13. | A | 23. | A | 33. | A |
| 4. | A | 14. | C | 24. | B | 34. | C |
| 5. | A | 15. | A | 25. | A | 35. | C |
| 6. | A | 16. | C | 26. | C | 36. | A |
| 7. | A | 17. | A | 27. | D | 37. | A |
| 8. | C | 18. | C | 28. | C | 38. | C |
| 9. | C | 19. | C | 29. | B | | |
| 10. | A | 20. | C | 30. | A | | |