11TH STD MSAT

Class 11 - Admission Test
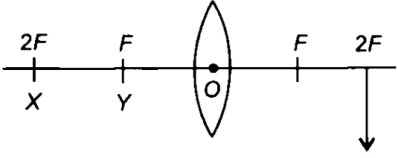
Time Allowed: 1 hour   **Maximum Marks: 60**

General Instructions:

- Overall, 60 questions are to be completed in 60 minutes.

- All questions are compulsory and there is no negative marking.

- Maths - 20 Questions

  Physics - 20 Questions

  Chemistry - 20 Questions

- These questions are based on the CBSE class-10 syllabus.

Physics

1. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should **[1]** be the position of the object?

   a) Between the principal focus and the centre of curvature

   b) Beyond the centre of curvature

   c) At the centre of curvature

   d) Between the pole of the mirror and its principal focus.

2. To produce an image by a convex lens at the position shown, (see figure) the object is needed to be placed **[1]**

   a) At X

   b) Between Y and O

   c) Between X and Y

   d) At Y

3. The nature of the graph between potential difference and the electric current flowing through a conductor is **[1]**

   a) hyperbolic

   b) parabolic

   c) circle

   d) straight line

4. Keeping the potential difference constant, the resistance of a circuit is doubled. The current will become: **[1]**

   a) Four times

   b) Half

   c) One-fourth

   d) Double

5. The maximum resistance which can be made using four resistors each of resistance $\frac{1}{2}\Omega$ is **[1]**

   a) 8Ω

   b) 1Ω

c) 2.5Ω   d) 2Ω

6. The commercial unit of energy is: **[1]**

    a) Kilo-joule   b) Kilowatt-hour

    c) Watt-hour   d) Watt

7. When an electric lamp is connected to 12 V battery, it draws a current of 0.5A. The power of the lamp is: **[1]**

    a) 0.5W   b) 24W

    c) 12W   d) 6W

8. The shape of magnetic field lines produced (i) inside a solenoid (ii) around a straight conductor, both carrying   **[1]**
    current of the same magnitude are, respectively:

    a) (i) straight, (ii) straight   b) (i) circular, (ii) straight

    c) (i) circular, (ii) circular   d) (i) straight, (ii) circular

9. The strength of an electromagnet after the limit cannot be increased by increasing the current through the   **[1]**
    solenoid. What is the reason behind this phenomenon?

    a) Voltage through the solenoid gradually starts   b) Electrons start to corrode the solenoid.
       to decrease.

    c) Resistance of the solenoid increases.   d) Current flowing through the solenoid is
                                                    saturated.

10. The core of electromagnet is: **[1]**

    a) Soft iron   b) Steel

    c) Magnesium   d) Copper

11. What capacity of fuse wire is to be used for geyser?   **[1]**

    a) 10 A   b) 15 A

    c) 20 A   d) 5 A

12. All the rays of light parallel to the principal axis after reflection pass through: **[1]**

    a) Pole   b) Focus

    c) Radius of curvature   d) Mid point of lens.

13. The phenomena of light responsible for the working of the human eye is: **[1]**

    a) Reflection   b) Persistence of vision

    c) Power of accommodation   d) Refraction

14. Hypermetropia can be corrected by: **[1]**

    a) Concave lens   b) Plano-concave lens

    c) Convex lens   d) Plano-convex lens

15. The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance   **[1]**
    because among all other colours, the red light.

    a) Is scattered the most by smoke or fog   b) Is absorbed the most by smoke or fog

c) Moves fastest in air   d) Is scattered the least by smoke or fog

16. An object moves a distance f between 2f and f of a concave mirror. The image would have travelled a distance of **[1]**

   a) $\frac{f}{2}$ b) ∞

   c) 2f   d) f

17. The work done in moving a unit charge across two points in an electric circuit is a measure of: **[1]**

   a) Potential difference   b) Power

   c) Resistance   d) Current

18. An electric iron of resistance 20Ω draws a current of 5 A. The heat developed in the iron in 30 seconds is: **[1]**

   a) 6000 J   b) 1500 J

   c) 15000 J   d) 3000 J

19. The wavelength corresponding to violet, yellow & red light are $\lambda v, \lambda y$ and λr respectively. **[1]**

   a) $\lambda v < \lambda y < \lambda r$ b) $\lambda v > \lambda y > \lambda r$

   c) $\lambda y < \lambda r < \lambda v$ d) $\lambda y < \lambda v < \lambda r$

20. What is the value of refractive index of the medium if the critical angle of incidence in a denser – rarer inter face **[1]**
    is equal to 45°?

   a) 3.25   b) 2.0

   c) 1.414   d) 2.414

Chemistry

21. The balanced chemical equation showing reaction between quicklime and water is: **[1]**

   a) $CaO + H_2O \rightarrow Ca(OH)_2 + H_2 + Heat$ b) $CaO + H_2O \rightarrow Ca(OH)_2 + Heat$

   c) $2 CaO + H_2O \rightarrow 2 CaOH + H_2 + Heat$ d) $2 CaO + 3 H_2O \rightarrow 2 Ca(OH)_3 + O_2 + Heat$

22. Metal X is found in earth's crust. This metal forms a reddish brown substance when exposed to moist air. When **[1]**
    a blue coloured solution Y is stored in a container made of X, the solution turns green and a reddish brown metal
    Z gets deposited on the container. X, Y and Z are respectively

   a) Fe, $CuSO_4$, Cu   b) Zn, $ZnSO_4$, Fe

   c) Cu, $FeSO_4$, Fe   d) Cu, $CuSO_4$, Fe

23. In the electrolysis of water, at which electrodes are hydrogen and oxygen collected? **[1]**

   a) graphite rods, metal rods   b) cathode, anode

   c) anode, cathode   d) graphite rods, non-metal rods

24. A small amount of a light green coloured compound X is heated in a test tube. In the beginning, it loses some **[1]**
    water and then gas(es) Z with a suffocating smell come(s) out. The vapours of gas(es) are collected and
    dissolved in water. The vapours of gas(es) are collected and dissolved in water. The solution turns blue litmus
    red. The residue Y left in the test tube turns reddish brown. X, Y and Z could be respectively

   a) $PbSO_4$, Pb_2O_3 and SO_3 b) $FeSO_4 \cdot 7H_2O$, Fe_2O_3 and SO_2, SO_3

   c) $Pb(NO_3)_2$, PbO_2 and NO_2, N_2O_4 d) $Na_2SO_4 \cdot 10H_2O$, Na_2SO_4 and SO_2

25. The green coating on copper appears on exposure to air. It is: **[1]**

    a) Copper carbonate   b) Copper sulphate

    c) Copper nitrate   d) Copper sulphide

26. A solution reacts with crushed egg shells to give a gas that turns lime water milky. The solution contains **[1]**

    a) LiCl   b) KCl

    c) HCl   d) NaCl

27. Hydronium ions are formed by the reaction between: **[1]**

    a) Hydrogen chloride gas and water   b) Sodium hydroxide and water

    c) Calcium chloride and water   d) Ethanol and water

28. Sodium hydroxide is termed an alkali while Ferric hydroxide is not because: **[1]**

  a. Sodium hydroxide is a strong base, while Ferric hydroxide is a weak base.

  b. Sodium hydroxide is a base which is soluble in water while Ferric hydroxide is also a base but it is not soluble in water.

  c. Sodium hydroxide is a strong base while Ferric hydroxide is a strong acid.

  d. Sodium hydroxide and Ferric hydroxide both are strong base but the solubility of Sodium hydroxide in water is comparatively higher than that of Ferric hydroxide.

    a) Option (c)   b) Option (b)
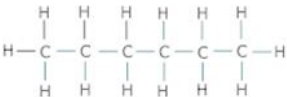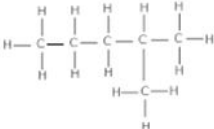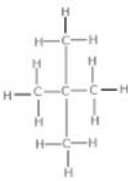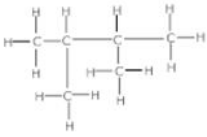
    c) Option (a)   d) Option (d)

29. Select washing soda from the following: **[1]**

    a) $Na_2CO_3 \cdot 5H_2O$ b) $NaHCO_3$

    c) $Na_2CO_3 \cdot 10H_2O$ d) $NaOH$

30. Select the incorrect match. **[1]**

    a) A metal used in joining electric wires - Magnesium   b) A metal extracted by using electrolytic reduction - Aluminium

    c) A metal whose oxide is soluble in both acids and bases - Zinc   d) A metal unreactive towards oxygen and dilute acids - Gold

31. Which of the following do not react readily with water? **[1]**

    a) Sodium   b) Potassium

    c) copper   d) Zinc

32. Fountain experiment demonstrates: **[1]**

    a) Manufacturing of NH_3 b) The solubility of NH_3 in H_2O

    c) The solubility of NH_3 d) The solubility of SO_2 in water

33. A basic lining is given to a furnace by using: **[1]**

    a) Silica   b) Haematite

    c) Calcined dolomite   d) Copper sulphate

34. Galvanisation process involves elements of zinc and iron. Which of the two metals is sacrificing its life to save the life of the other? **[1]**

    a) Mg   b) Both sacrifice each other's life

    c) Zn   d) Fe

35. Carbon exists in the atmosphere in the form of **[1]**

    a) coal   b) carbon dioxide only

    c) carbon monoxide in traces and carbon dioxide   d) carbon monoxide only

36. Which of the following represent the formula C_6H_{14}? **[1]**

    a) A, B and D   b) A and C

    c) All of these   d) A and B

37. The number of single and double bonds present in a molecule of benzene (C_6H_6) respectively, are: **[1]**

    a) 9 and 3   b) 6 and 6

    c) 3 and 3   d) 3 and 9

38. Chlorine reacts with saturated hydrocarbons at room temperature in the **[1]**

    a) presence of water   b) absence of sunlight

    c) presence of hydrochloric acid   d) presence of sunlight

39. An organic compound X has the molecular formula C_2H_6O. Upon reaction with alkaline $KMnO_4$ it gets oxidised to compound Y. Which of the following reagents can be used to distinguish between compounds X and Y? **[1]**

    a) All of these   b) Sodium hydroxide

    c) Sodium metal   d) Sodium carbonate

40. The correct formula of ethanol is: **[1]**

    a) CH_3OH b) C_2H_5OH

    c) C_2H_6OH d) $CH_3CH_2CH_2OH$

Maths

41. In a lottery, there are 6 prizes and 24 blanks. What is the probability of not getting a prize? **[1]**

    a) $\frac{2}{5}$ b) $\frac{3}{4}$

    c) $\frac{3}{5}$ d) $\frac{4}{5}$

42. If the mean of first n natural numbers is 15, then n = **[1]**

    a) 30   b) 14

    c) 15   d) 29

43. The time, in seconds, taken by 150 athletes to run a 100 m hurdle race are tabulated below: **[1]**

Time (sec.)	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19
Number of Athletes	2	4	5	71	48	20

The number of athletes who completed the race in less than 17 seconds is

    a) 82   b) 71

    c) 11   d) 68

44. The zeroes of the polynomial $x^2 - 3x - m(m + 3)$ are: **[1]**

    a) $-m, -(m + 3)$ b) $m, -(m + 3)$

    c) $-m, m + 3$ d) $m, m + 3$

45. If A(5, 3), B(11, -5) and P(12, y) are the vertices of a right triangle right angled at P, then y = **[1]**

    a) -1, 4   b) 2, 4

    c) -2, 4   d) 2, -4

46. The perpendicular bisector of the line segment joining the points A (1, 5) and B (4, 6) cuts the y-axis at **[1]**

    a) (0, -13)   b) (0, 12)

    c) (0, 13)   d) (13, 0)

47. The graph of the linear equation 2x + 5y = 10 meets the x-axis at the point. **[1]**

    a) (2, 0)   b) (5, 0)
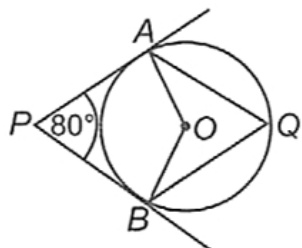
    c) (0, 5)   d) (0, 2)

48. $\triangle$ABC is such that AB = 3 cm, BC = 2 cm and CA = 2.5 cm. If $\triangle DEF \sim \triangle ABC$ and EF = 4 cm, then perimeter of $\triangle$DEF is **[1]**

    a) 30 cm   b) 15 cm

    c) 22.5 cm   d) 7.5 cm

49. $\triangle$ABC is a right triangle right-angled at A and $AD \perp BC$, Then $\frac{BD}{DC} =$ **[1]**

    a) $\frac{AB}{AD}$ b) $\frac{AB}{AC}$

    c) $\left(\frac{AB}{AD}\right)^2$ d) $\left(\frac{AB}{AC}\right)^2$

50. In the given figure, O is the centre of the circle. If PA and PB are tangents, then the value of $\angle$AQB is **[1]**

    a) 80º   b) 60º

c) 50° d) 100°

51. At one end of a diameter PQ of a circle of radius 5 cm, tangent XPY is drawn to the circle. The length of chord AB parallel to XY and at a distance of 8 cm from P is **[1]**

     a) 6 cm   b) 5 cm

     c) 7 cm   d) 8 cm

52. The product of two consecutive integers is 240. The quadratic representation of the above situation is **[1]**

     a) $x(x + 1) = 240$ b) $x(x + 1)^2 = 240$

     c) $x + (x + 1) = 240$ d) $x^2 + (x + 1) = 240$

53. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots, is **[1]**

     a) 12   b) 4

     c) 8   d) 16

54. If $-\frac{5}{7}$, a, 2 are consecutive terms in an Arthimetic Progression, then the value of **a** is **[1]**

     a) $\frac{19}{14}$ b) $\frac{9}{14}$

     c) $\frac{9}{7}$ d) $\frac{19}{7}$

55. In an AP if a = –7.2, d = 3.6, a_n = 7.2, then n is **[1]**

     a) 3   b) 1

     c) 5   d) 4

56. In an A.P., the sum of first n terms is $\frac{3n^2}{2} + \frac{13n}{2}$. Find its 25th term. **[1]**

     a) 120   b) 80

     c) 78   d) 60

57. If $\cos \theta = \frac{4}{5}$ then $\tan \theta$ = ? **[1]**

     a) $\frac{3}{4}$ b) $\frac{5}{3}$

     c) $\frac{4}{3}$ d) $\frac{3}{5}$

58. An observer 1.5 m tall is 23.5 m away from a tower 25m high. The angle of elevation of the top of the tower from the eye of the observer is **[1]**

     a) 60° b) 15°

     c) 30° d) 45°

59. A sector of a circle of radius 8 cm contains an angle of 135. Find the area of the sector. **[1]**

     a) 14π cm^2 b) 25π cm^2

     c) 24π cm^2 d) 20π cm^2

60. The value of $\csc^4 A - 2\csc^2 A + 1$ is **[1]**

     a) $\tan^4 A$ b) $\sec^4 A$

     c) $\csc^4 A$ d) $\cot^4 A$