



APTITUDE TEST FOR PLUS ONE ADMISSION – 2024

SCIENCE STREAM

PHYSICS

1. A concave mirror produces 10 cm long image of an object of height of 2 cm on a screen. What is the magnification produced?
A. -5
B. +0.5
C. +5
D. -0.2
E. +0.2
2. In an electrical circuit, two resistors of $2\ \Omega$ and $4\ \Omega$ respectively are connected in series to a 6 V battery. The heat dissipated by the $4\ \Omega$ resistor in 5 s will be:
A. 5J
B. 10J
C. 20J
D. 30J
E. 40J
3. You are given three media P, Q and R of refractive index 1.33, 1.65 and 1.46. The medium in which the light travels fastest:
A. P
B. Q
C. R
D. Equal in all three media
E. Insufficient data
4. The relation between potential difference (V) and current (I) is:
A. $V \propto I^2$
B. $V \propto 1/I$
C. $V^2 \propto I$
D. $V \propto I$
E. $V = I$
5. In torches, search lights and headlights of vehicles, the bulb is placed:
A. At the pole of the reflector
B. Between the pole and the focus of the reflector
C. At the focus of the reflector
D. Between the focus and centre of curvature of the reflector
E. At the centre of curvature of the reflector
6. An electric kettle consumes 1 kW of electric power when operated at 220 V. A fuse wire of what rating must be used for it?
A. 1A
B. 2A
C. 3A
D. 4A
E. 5A
7. When white light passes through a prism, maximum deviation is for:
A. Red colour
B. Yellow colour
C. Blue colour
D. Violet colour
E. Green colour
8. The heating element of an electric iron is made up of:
A. copper
B. nichrome
C. aluminium
D. silver
E. iron

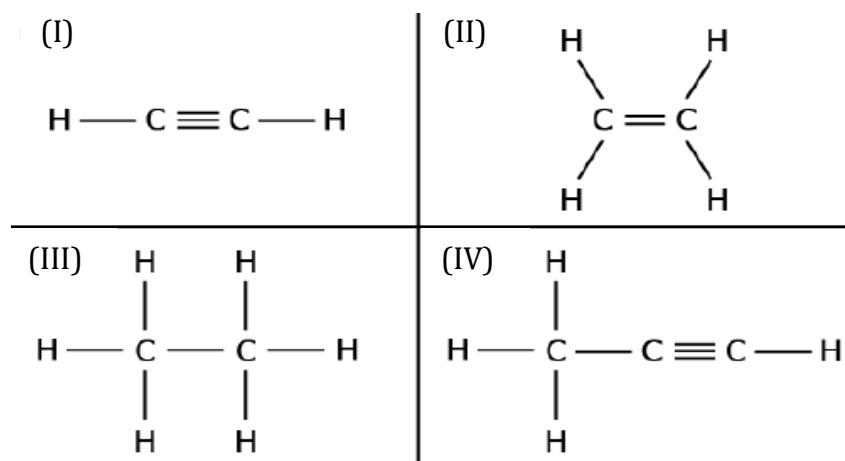
9. A concave mirror gives real, inverted, and same size image, if the object is placed:
- At F
 - At infinity
 - At C
 - Beyond C
 - Between F and C
10. If two electric bulbs one of 200 V–40 W and other of 200 V–100 W are connected in a domestic circuit, then
- They have equal resistance
 - The resistance of 100 W bulb is more than 40 W bulb
 - They have equal current passing through them
 - The resistance of 40 W bulb is more than 100 W bulb
 - None of the above
11. Power of the lens is -4D. Its focal length is:
- 4m
 - 4m
 - 0.25m
 - 25m
 - 25m
12. The magnetic field lines produced by a bar magnet:
- Originate from the South Pole and end at its north pole
 - Originate from the North Pole and end at its east pole
 - Originate from the North Pole and end at its south pole
 - Originate from the South Pole and end at its west pole
 - All of the above.
13. When the object is placed between F and 2F of a convex lens, the image formed is:
- At F
 - At 2F
 - Beyond 2F
 - Between O and F
 - Between 2F and F
14. A current carrying conductor placed in magnetic field experiences a force. The displacement of the conductor in magnetic field can be increased by:
- Decreasing the current in the conductor
 - Decreasing the magnetic field
 - Increasing the magnetic field
 - Increasing the current in the conductor
 - None of the above
15. A current carrying conductor placed in magnetic field experiences a force. The amount of force experienced by a current carrying conductor in magnetic field can be increased by:
- Decreasing the magnetic field.
 - Increasing the current in the conductor.
 - Increasing the magnetic field.
 - Decreasing the current in the conductor.
 - Both option A and B

CHEMISTRY

16. On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution:
- A. Turns colourless and a grey substance is deposited on the copper coin
 - B. Turns colourless and reddish-brown substance is deposited on the copper coin
 - C. Turns blue, and a grey substance is deposited on the copper coin
 - D. Remains green with no change in the copper coin
 - E. Turns green and a reddish-brown substance is deposited on copper coin
17. The pair which will show displacement reaction is/are
- i) NaCl solution and copper metal
 - ii) AgNO₃ solution and copper metal
 - iii) Al₂(SO₄)₃ solution and magnesium metal
 - iv) ZnSO₄ solution and Iron metal
 - v) FeSO₄ solution and copper metal
- A. i only
 - B. ii and iii
 - C. i and ii
 - D. ii only
 - E. iii and iv
18. From the following, which one is an example of a chemical reaction?
- A. Grapes get fermented
 - B. Breakdown of food
 - C. Formation of curd
 - D. Rusting of iron
 - E. All of the these
19. What happens when lead nitrate reacts with potassium iodide?
- A. They will not react
 - B. A large amount of hydrogen will be released
 - C. Yellow precipitate of lead iodide and potassium nitrate will be produced
 - D. Evolution of gas will occur
 - E. Yellow precipitate of lead iodide and nitrogen dioxide gas will be evolved
20. What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- (i) The temperature of the solution decreases
 - (ii) The temperature of the solution increases
 - (iii) The temperature of the solution remains the same
 - (iv) Salt formation takes place
 - (v) No reaction takes place
- A. (ii) only
 - B. (i) and (iv)
 - C. (v) only
 - D. (i) and (iii)
 - E. (ii) and (iv)

21. In terms of acidic strength, which one of the following is in the correct increasing order?
- | | |
|--|--|
| A. Water < Acetic acid < Hydrochloric acid | D. Hydrochloric acid < Water < Acetic acid |
| B. Water < Hydrochloric acid < Acetic acid | E. Acetic acid < Hydrochloric acid < Water |
| C. Acetic acid < Water < Hydrochloric acid | |
22. Identify the strong base from the given bases
- | | |
|-----------------------|------------------------|
| A. Calcium hydroxide | D. Magnesium hydroxide |
| B. Ammonium hydroxide | E. Copper hydroxide |
| C. Ferric Hydroxide | |
23. Aqua regia is a freshly prepared mixture of concentrated HNO_3 and concentrated HCl in the ratio of:
- | | |
|----------------------|----------------------|
| A. 1:3, respectively | D. 3:2, respectively |
| B. 2:3, respectively | E. 1:1, respectively |
| C. 3:1, respectively | |
24. Which of the following is commonly used as an antacid?
- | | |
|------------------------|----------------------|
| A. Magnesium hydroxide | D. Calcium hydroxide |
| B. Potassium hydroxide | E. Sodium carbonate |
| C. Magnesium carbonate | |
25. The correct chemical formula of ferric sulphate is
- | | |
|---------------------------------|---------------------------------|
| A. FeSO_4 | D. $\text{Fe}(\text{SO}_4)_2$ |
| B. Fe_2SO_4 | E. $\text{Fe}_2(\text{SO}_4)_3$ |
| C. $\text{Fe}_3(\text{SO}_4)_2$ | |
26. What happens when a pellet of sodium is dropped in water?
- | | |
|--|--|
| A. It catches fire and forms oxide | D. It absorbs heat and forms hydroxide |
| B. It absorbs heat and forms oxide | E. It dissolves in water and forms hydroxide |
| C. It catches fire and forms hydroxide | |
27. The highly reactive metals like Sodium, Potassium, Magnesium, etc. are extracted by the
- | | |
|--|-----------------------------------|
| A. electrolysis of their molten chloride | C. electrolysis molten carbonates |
| B. electrolysis of their molten oxides | D. reduction by aluminium |
| | E. reduction by carbon |

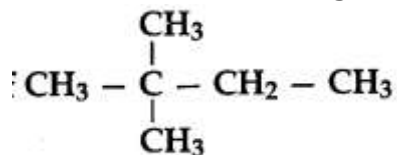
28. The image represents the structure of a few hydrocarbon compounds.



Which of these compounds can be classified as alkynes?

- A. Only (I)
 B. Only (II)
 C. Both (I) and (IV)
 D. Both (II) and (III)
 E. I, II and IV

29. The IUPAC name of the following compound is:



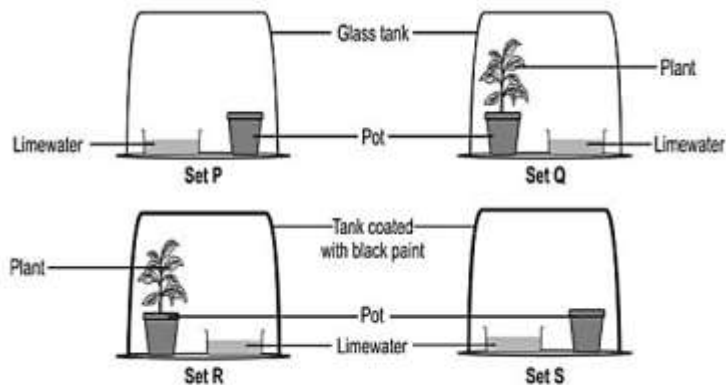
- A. 2-ethyl-2-methyl propane
 B. 2, 2-dimethyl butane
 C. 1,1,1-trimethyl propane
 D. 2, 2-methyl butane
 E. 2-dimethyl butane

30. Ethanol reacts with sodium and forms two products. These are:

- A. Sodium ethanoate and hydrogen
 B. Sodium ethanoate and oxygen
 C. Sodium ethoxide and hydrogen
 D. Sodium ethoxide and oxygen
 E. Sodium ethoxide and water

BIOLOGY

31. Shown below are four setups kept in sunlight for 24 hours.



In which setup is lime water expected to be the cloudiest?

- | | |
|------------|------------------|
| A. Setup P | D. Setup S |
| B. Setup Q | E. Setup R and S |
| C. Setup R | |

32. Anaerobic process :

- | | |
|---|---|
| A. Takes place in yeast during fermentation. | D. Produces ethanol, oxygen and energy. |
| B. Takes place in the presence of oxygen. | E. Takes place in mitochondria. |
| C. Produces only energy in the muscles of human beings. | |

33. Most of the digestion and absorption of the food takes place in the:

- | | |
|---------------------|---------------------|
| A. Small intestine. | D. Large intestine. |
| B. Liver. | E. Mouth |
| C. Stomach. | |

34. Matter and energy are two fundamental inputs of an ecosystem.

- | | |
|---|---|
| A. Energy is bidirectional and matter is repeatedly circulating. | C. Energy is unidirectional and matter is repeatedly circulating. |
| B. Energy is repeatedly circulation and matter is unidirectional. | D. Energy is multidirectional and matter is bidirectional. |
| | E. Energy and matter is bidirectional. |

35. The decomposers are not included in the food chain. The correct reason for the same is because decomposers:

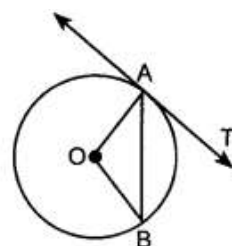
- | | |
|--|---|
| A. Act at every trophic level of the food chain. | D. Release enzymes outside their body to convert organic material to inorganic forms. |
| B. Do not breakdown organic compound. | E. They are not a part of the ecosystem. |
| C. Convert organic material to inorganic forms. | |

36. In an ecosystem, 10% of energy available for transfer from one trophic level to the next is in the form of:
- A. Heat energy
 - B. Chemical energy
 - C. Mechanical energy
 - D. Light energy
 - E. None of the above
37. Which of the following statements is not true about a 'bud' in 'Hydra'?
- A. It is an outgrowth.
 - B. It forms due to repeated cell division at one specific site.
 - C. It detaches from the parent body as soon as it is produced.
 - D. It becomes a new independent individual.
 - E. All of the above.
38. In tissue culture method a small piece of tissue grows and forms:
- A. Callus
 - B. Hyphae
 - C. Synapse
 - D. Adventitious buds
 - E. Sporangia
39. Select the statements that are incorrect about reproduction in human beings.
- (I) When a girl is born, the ovaries already contain thousands of mature eggs.
 - (II) One egg is produced every month by one of the ovaries.
 - (III) The egg is carried from the ovary to the womb through oviduct.
 - (IV) The two oviducts unite into an elastic bag-like structure known as the cervix.
- A. Both (I) and (III)
 - B. Both (I) and (IV)
 - C. Both (II) and (III)
 - D. Both (II) and (IV)
 - E. Both (I) and (II)
40. In the human blood grouping, the four basic blood types are type A, type B, type AB, and type O. The blood proteins A and B are :
- A. simple dominant and recessive traits
 - B. incomplete dominant traits
 - C. codominant traits
 - D. sex-linked traits
 - E. neither dominant nor recessive
41. The palisade cells of a species of plant contain 28 chromosomes. How many chromosomes will there be in each gamete produced by the plant?
- A. 56
 - B. 28
 - C. 14
 - D. 4
 - E. 20
42. When an individual is having both the alleles of a contrasting character, it is said to be:
- A. Homozygous
 - B. Heterozygous
 - C. Dioecious
 - D. Monoecious
 - E. Bisexual

43. The brain is covered by membranes called:
- | | |
|-------------|---------------|
| A. Pleura | D. Bladder |
| B. Placenta | E. Cerebellum |
| C. Meninges | |
44. The stimulus in thigmonasty is :
- | | |
|-------------|----------|
| A. Light | D. Water |
| B. Chemical | E. Taste |
| C. Touch | |
45. Reflex arc is formed by:
- | | |
|--|--|
| A. muscle $\rightarrow$ brain $\rightarrow$ receptor | D. receptor $\rightarrow$ spinal cord $\rightarrow$ muscle |
| B. muscle $\rightarrow$ spinal cord $\rightarrow$ receptor | E. effector $\rightarrow$ brain $\rightarrow$ spinal cord |
| C. receptor $\rightarrow$ brain $\rightarrow$ muscles | |

MATHEMATICS

46. If $\sin^2 A = \cos^2 A$, then value of $\cot^6 A - \cot^2 A$?
- | | |
|------|-------|
| A) 1 | D) -1 |
| B) 2 | E) -2 |
| C) 0 | |
47. If $\cot A + \operatorname{cosec} A = 3$ and A is an acute angle, then the value of $\cos A$ is
- | | |
|------------------|-------------------------|
| A) 1 | D) 0 |
| B) $\frac{4}{5}$ | E) $\frac{\sqrt{3}}{2}$ |
| C) $\frac{3}{5}$ | |
48. The letters of the word SOCIETY are placed at random in a row. The probability of getting a vowel is
- | | |
|------------------|------------------|
| A) $\frac{1}{7}$ | D) $\frac{3}{7}$ |
| B) $\frac{1}{5}$ | E) $\frac{5}{7}$ |
| C) $\frac{3}{5}$ | |
49. In figure, O is the centre of a circle, AB is a chord and AT is the tangent at A .
If $\angle AOB = 100^\circ$, then $\angle BAT$ is equal to
- | | |
|----------------|----------------|
| A) 100° | D) 40° |
| B) 50° | E) 100° |
| C) 90° | |



50. If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is
- | | |
|------------|------------|
| A) 4 units | D) 8 units |
| B) 1 unit | E) 3 units |
| C) 2 units | |

51. Mean of n numbers $x_1, x_2, x_3, \dots$ is m . If x_n is replaced by x , then the new mean is

- A) $m - x_n + x$ D) $\frac{m + x - x_n}{n}$
 B) $mn + x - x_n$ E) $\frac{nm - x + x_n}{n}$
 C) $\frac{nm + x - x_n}{n}$

52. The volumes of two spheres are in the ratio 125:64, ratio of their surface areas is

- A) 9:16 D) 16:9
 B) 25:16 E) 1:1
 C) 16:25

53. If $x \cdot \tan 45^\circ \cdot \cos 60^\circ = \sin^2 60^\circ$, then $x =$

- A) 1 D) 3
 B) $\frac{3}{2}$ E) 2
 C) $\frac{2}{3}$

54. If pair of equations $ax + 2y = 7$ and $3x + by = 16$ represent parallel lines, then $ab =$

- A) 6 D) 32
 B) 3 E) $\frac{3}{2}$
 C) 1

55. The equation $5x^2 + (9 + 4k)x + 2k^2 = 0$ and $5x + 9 = 0$ are satisfied by same value of x . Find the values of k .

- A) 0, 5/18 D) 0, 13/5
 B) 0, -13/5 E) 0, 18/5
 C) 0, 36/5

56. Three farmers have 490 kg, 588 kg and 882 kg of wheat respectively. Find the maximum capacity of a bag so that the wheat can be packed in exact number of bags.

- A) 98kg D) 250kg
 B) 290kg E) 300kg
 C) 78kg

57. If α, β are zeroes of $x^2 - (p+6)x + 2(2p-1)$ and $\alpha + \beta = \frac{1}{2} \alpha \beta$, find p

- A) 1 D) -7
 B) 0 E) -1
 C) 7

58. It is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, which of the following is true:

- A) congruent but not similar D) congruent as well as similar
 B) similar but not congruent E) None of these
 C) neither congruent nor similar

59. Two numbers are in the ratio 5: 6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Then the numbers are

A) 40,42

D) 44,50

B) 42,48

E) 32, 45

C) 40,48

60. Two vertices of a triangle are $(3, -5)$ and $(-7, 4)$. If its centroid is $(2, -1)$, then the third vertex is

A) $(10, 2)$

D) $(-10, -2)$

B) $(-10, 2)$

E) $(-10, 0)$

C) $(10, -2)$