

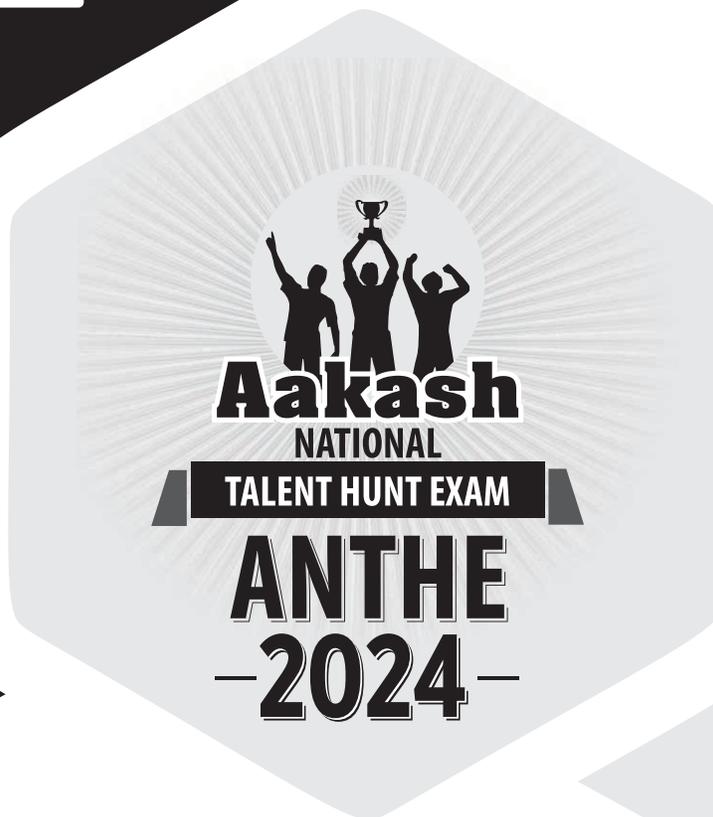
Sample Paper

FOUNDATIONS



Aakash

Medical | IIT-JEE | Foundations



(Class IX Studying Moving to Class X)

Science, Mathematics & Mental Ability

INSTRUCTIONS FOR CANDIDATE

1. Duration of Test is 1 hr.
2. The Test Booklet consists of **40** questions. The maximum marks are **90**. There is **no negative marking** for wrong answer.
3. Pattern of the questions are as under:
 - (i) The question paper consists of three parts *i.e.*, **Science, Mathematics** and **Mental Ability**. Each part has **two sections**.
 - (ii) **Section-I**: This section contains **35** multiple choice questions, which have **only one** correct answer. Each question carries **+2 marks** for correct answer.
 - (iii) **Section-II**: This section contains **5** multiple choice questions, in which **one or more than one** choice(s) is(are) correct. Each question carries **+4 marks** for correct answer.

Aakash National Talent Hunt Exam 2024

Sample Paper

(Class IX Studying Moving to Class X)

(The questions given in sample paper are indicative of the level and pattern of questions that will be asked in ANTHE-2024)

Time : 1 Hour

MM : 90

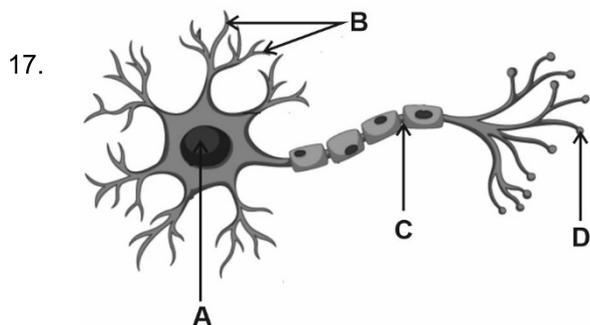
SCIENCE

SECTION-I : SINGLE CORRECT ANSWER TYPE

This section contains 18 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

- The inertia of an object is measured by its
 - Velocity
 - Acceleration
 - Mass
 - Speed
- Which of the following is a unit of velocity?
 - m/s^2
 - m^2/s
 - m/s
 - m^3/s
- The mass of an object at pole is 20 kg. Its mass on the equator will be
 - Less than 20 kg
 - Equal to 20 kg
 - More than 20 kg
 - Zero
- Two cars A and B are moving around a horizontal circular track. Car A follows a track of radius 200 m and car B follows a track of radius 224 m. If car B is moving with a uniform speed of 32 m/s, then the time taken by car B to go once around the track is
 - 22 s
 - 11 s
 - 44 s
 - 24 s
- A bullet of mass 20 g moving with a speed of 250 m/s penetrates into a heavy wooden block and stopped after covering a distance of 10 cm. The average force exerted by the wooden block on the bullet is
 - 1.25 kN
 - 6.25 kN
 - 2.35 kN
 - 3.75 kN
- The force of gravitation between two objects each of mass 6 kg is 5 N. If the distance between the objects is reduced by three-fourth of its initial value, then the force of gravitation between the objects will be
 - 5 N
 - 20 N
 - 40 N
 - 80 N
- Which of the following elements has been matched incorrectly with its symbol?
 - Hydrogen : H
 - Phosphorus : P
 - Oxygen : O
 - Sodium : S

8. Which of the following is a surface phenomenon?
- (1) Boiling (2) Diffusion
(3) Melting (4) Evaporation
9. The atomicity of ammonia is
- (1) 8 (2) 7
(3) 3 (4) 4
10. Which of the following sets of substances indicates only elements?
- (1) Sodium, hydrogen and carbon (2) Iron filings, mercury and dry ice
(3) Ice, dry ice and sulphuric acid (4) Mercury, bromine and sugar
11. Consider the following processes.
- X** : Conversion of ammonium chloride vapours into solid.
Y : Conversion of dry ice into fumes.
- 'X' and 'Y' respectively depict the process of
- (1) Sublimation and deposition (2) Condensation and sublimation
(3) Deposition and sublimation (4) Fusion and deposition
12. Saloni prepared 250 g solution of calcium chloride in water, having concentration 25% (w/w). Her friend, Monika added 100 g more water to this solution. The final concentration (% w/w) of the solution will be
- (1) 15.56% (2) 17.85%
(3) 20.82% (4) 25.32%
13. The gaseous exchange between the cells occurs through
- (1) Osmosis (2) Nutrition
(3) Photosynthesis (4) Diffusion
14. Cell was discovered by
- (1) Robert Hooke (2) Purkinje
(3) Virchow (4) Schleiden
15. Which of the following components of phloem consists of dead cells?
- (1) Phloem parenchyma
(2) Phloem fibres
(3) Sieve tubes
(4) Companion cells
16. Select the **incorrect** statement w.r.t. skeletal muscles.
- (1) They are voluntary in nature
(2) They show alternate light and dark bands when stained appropriately
(3) They are found in iris of the eye
(4) Their cells are unbranched and multinucleated



Which of the following labelled parts (**A-D**) in the given figure represent dendrite and axon respectively?

- (1) A and C
 - (2) B and C
 - (3) B and D
 - (4) A and D
- 18.
- They occupy 50 – 90% of cell volume in some plant cells.
 - They provide turgidity and rigidity to the plant cell.

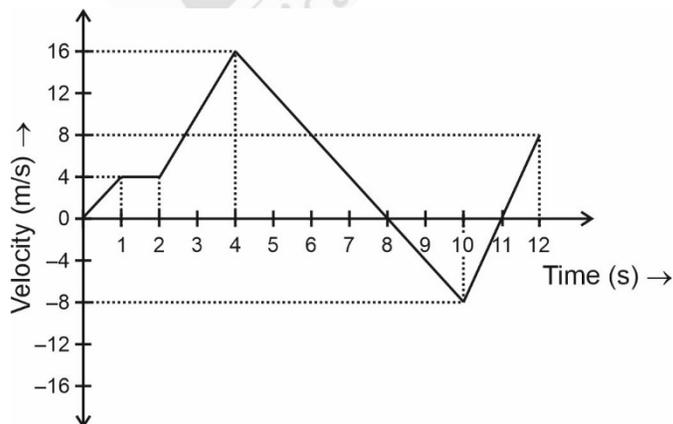
Identify the cell organelle on the basis of given information and choose the correct option.

- (1) Vacuoles
- (2) Lysosomes
- (3) Mitochondria
- (4) Plastids

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 3 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

19. Velocity-time graph of a body moving in a straight line is shown in the figure. Then choose the correct option(s).



- (1) Displacement of the body at $t = 11$ s is 46 m
- (2) Average velocity of the body for time interval $t = 0$ to $t = 8$ s is 7.25 m/s
- (3) Average velocity of the body for time interval $t = 0$ to $t = 8$ s is 4.6 m/s
- (4) Total distance covered by the body in 12 s is 46 m

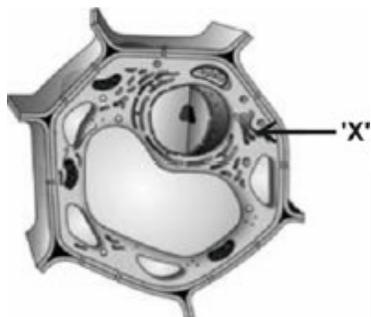
20. Consider the following table.

Name of the compound	Elements present	Ratio by number of atoms	Molecular mass (u)
X	C, H	1 : 1	26
Nitric acid	H, N, O	1 : 1 : 3	m
Quicklime	Ca, O	1 : 1	n

Now, choose the correct option(s).

- (1) 'X' is ethyne and its chemical formula is C_2H_2
- (2) The value of m is 63
- (3) Chemical formula of nitric acid is HNO_3 and it is a tetra-atomic molecule
- (4) Chemical name of quicklime is calcium oxide and the value of n is 56

21.



Select the correct statement(s) regarding the part labelled as 'X' in the above given figure of a plant cell.

- (1) It constitutes a part of complex cellular membrane system
- (2) It plays a crucial role in detoxifying many poisons and drugs
- (3) It has the ability to make some of its own proteins
- (4) It is involved in formation of complex sugars from simple sugars

MATHEMATICS

SECTION-I : SINGLE CORRECT ANSWER TYPE

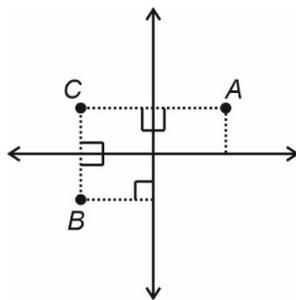
This section contains 10 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

22. If $\sqrt[3]{16\sqrt[3]{64\sqrt[3]{256\sqrt[3]{128}}}} = 4^{2x}$, then the value of x is

- | | |
|-----------------------|-----------------------|
| (1) $\frac{161}{81}$ | (2) $\frac{193}{81}$ |
| (3) $\frac{193}{324}$ | (4) $\frac{193}{224}$ |

23. If the distance of a point is equal from both x -axis and y -axis, then the co-ordinates of the point can be
- (1) $\left(\frac{1}{\sqrt{2}}, \sqrt{2}\right)$
 - (2) $(0, 4)$
 - (3) $(4, 0)$
 - (4) $(-4, 4)$
24. If $(-3, 5)$ is a solution of the linear equation $5x + 3y + 187 = 6k^2 + 29k$, then the value of $6k$ can be
- (1) -22
 - (2) 50
 - (3) -51
 - (4) 11
25. The value of $\left(\frac{11.\bar{1} - 4.1\bar{6}}{1.3\bar{8}}\right)$ is equal to
- (1) 5
 - (2) 5.028
 - (3) $5.0\bar{2}$
 - (4) $4.9\bar{8}$
26. If $(x - 1)$ is a factor of $p(x)$, then $p(1)$ is equal to
- (1) 0
 - (2) 1
 - (3) -1
 - (4) 2
27. $\frac{\left(\frac{1}{2}x - y\right)^3 + \left(2y + \frac{3x}{2}\right)^3 - (y + 2x)^3}{\left(3y - \frac{3}{2}x\right)\left(2y + \frac{3x}{2}\right)(y + 2x)}$ is equal to
- (1) $\frac{1}{3}$
 - (2) $\frac{1}{6}$
 - (3) $\frac{-1}{3}$
 - (4) 1

28. In the given figure, if coordinates of points A and B are $(3, 4)$ and $(-5, -2)$ respectively, then coordinates of point C are

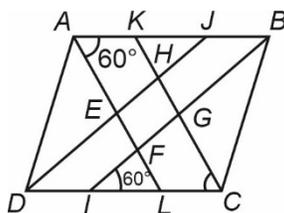


- (1) $(-5, 3)$
 (2) $(-2, 3)$
 (3) $(-5, 4)$
 (4) $(-2, 4)$
29. One of the factors of $9(8x^3 - 3y^3 + 8x^2y)$ can be
- (1) $4x^2 + 6xy - 3y^2$
 (2) $x - 2y$
 (3) $4x^2 - 6xy + 3y^2$
 (4) $2x - y$
30. The sum of supplement of complement of supplement of 110° and complement of 70° is
- (1) 110° (2) 180°
 (3) 160° (4) 100°
31. If $7x + 10y = k$, $-1 \leq y \leq 1$ where k is a single digit natural number and x and y are integers, then the number of possible values of (x, y) is
- (1) 10 (2) 3
 (3) 9 (4) 13

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 1 multiple choice question, which has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

32. In the given figure, $ABCD$ is a quadrilateral, $ALCK$ and $JBID$ are parallelograms. If $AF = DH$, $\angle LAB = 60^\circ$, $\angle BIC = 60^\circ$, then choose the correct statement(s).



- (1) $\triangle FAB \cong \triangle HDC$ (2) $\angle DJB = \angle CKA = 120^\circ$
 (3) $\triangle FAB$ is an equilateral triangle (4) $ABCD$ is a parallelogram

MENTAL ABILITY

SECTION-I : SINGLE CORRECT ANSWER TYPE

This section contains 7 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

33. P and Q are brothers and their father is R, who is married to S. S is the only daughter of T and U. How is R related to U?

- (1) Son
- (2) Son-in-law
- (3) Father-in-law
- (4) Brother-in-law

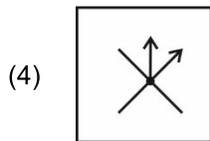
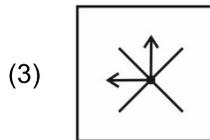
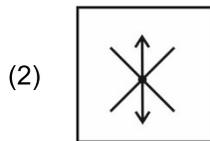
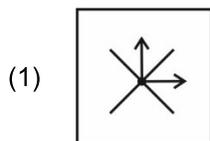
34. Find the next term in the given series.

JBE, LDG, OGJ, SKN, XPS, ?

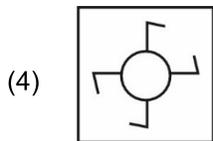
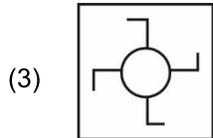
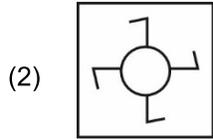
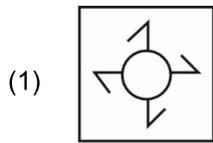
- (1) DVZ
- (2) DVY
- (3) DUY
- (4) EVY

35. Complete the figure matrix.

		?



36. Find odd one out.



37. Find the next term in the given series.

27, 343, 1331, 3375, 6859, ?

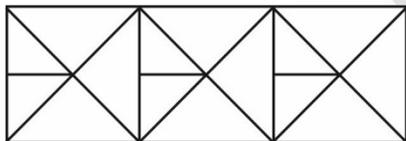
(1) 12617

(2) 9261

(3) 15625

(4) 12167

38. The total number of triangles in the following figure is



(1) 30

(2) 28

(3) 34

(4) 36

39. If in a certain mathematical language,

$2 * 6 \# 5 = 34$, $5 * 7 \# 10 = 95$ and $7 * 4 \# 8 = 81$, then $10 * 6 \# 7 = ?$

(1) 140

(2) 142

(3) 147

(4) 149

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 1 multiple choice question, which has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

40. Choose the correct pair(s) in place of (?).

1234 : 11 :: 4368 : 48 :: 5439 : 51 :: ?

(1) 4387 : 53

(2) 6579 : 89

(3) 7543 : 43

(4) 8642 : 44



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