

TEST ID : 901
MAX. MARKS : 500
EXAM DURATION : 2 HOURS

Roll No.

Name :

Exam Date :

M-STAR[★]

Momentum Scholarship Test for Admission & Rewards

8th Edition, 2023-24

Talent HUNT Exam



**Class IX Studying Students
Mathematics, Science & Logical Reasoning**

INSTRUCTIONS FOR CANDIDATE

1. This booklet is your Question Paper. Do not open this booklet before being instructed to do so by the invigilator.
2. You may complete Your Name, Roll No. on the cover page.
3. Blank spaces and blank pages are provided in this booklet for your rough work. No Additional sheet will be provided for rough work.
4. Blank papers, clipboards, log tables, slide rules, calculators, cameras, cellular phones, pagers and electronic gadgets are NOT allowed inside the examination hall.
5. **Using a Blue/Black Pen, Darken the bubbles on the OMR sheet**
6. DO NOT TAMPER WITH/MUTILATE THE OMR OR THE BOOKLET
7. In the booklet, check that all the 100 questions and corresponding answer choices are legible.
8. Write your name, class and the Father's name in the boxes provided on the right part of the OMR. Do not write any of this information anywhere else. Darken the appropriate bubble under each digit of your Roll Number and Test ID Number.
9. The question paper consists of three sections. **Section A** consists of **Mathematics**, **Section B** consists of **Science** and **Section C** consists **Logical Reasoning Questions**.
10. **Section A** contain 35 multiple choice questions, **Section B** contain 40 multiple choice questions and **Section C** contains 25 multiple choices questions. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.
11. Marking Scheme: +5 for correct answer, 0 for unattempted and -1 for wrong attempt .
12. On completion of the test, the candidate must hand over the **OMR** Sheet to the invigilator on duty in the Room/Hall.



MOMENTUM

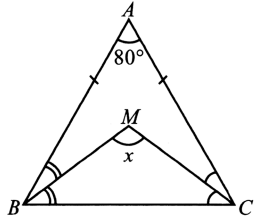
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SECTION - A : Math

This section contains **35 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. In the given figure, find the value of x , if $\angle BAC = 80^\circ$ and $AB = AC$.

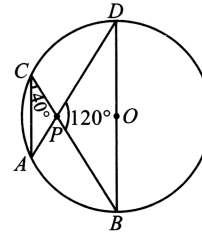


- A. 110°
 B. 130°
 C. 95°
 D. 85°
2. If $x = 3, y = -2$ is a solution of the linear equation $3x - ky = 1$, then find the value of k .
- A. 6
 B. -2
 C. 3
 D. -4
3. If a sum of ₹ 25600 amount to ₹ 36450 in t years at the rate of 25% p.a. compounded half yearly, then find the value of t .
- A. 3 years
 B. $1\frac{1}{2}$ years
 C. 2 years
 D. $2\frac{1}{2}$ years

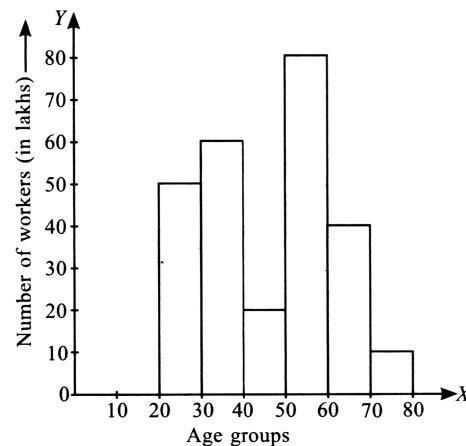
4. Simplify : $\frac{5^{n+2} - 6 \times 5^{n+1}}{13 \times 5^n - 2 \times 5^{n+1}}$

- A. 1
 B. 0
 C. $\frac{5}{3}$
 D. $-\frac{5}{3}$

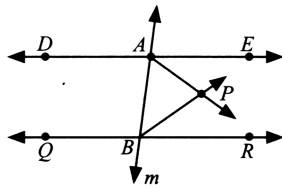
5. In the given figure (not drawn to scale), $\angle ACP = 40^\circ$ and $\angle BPD = 120^\circ$, then $\angle CBD =$ _____.



- A. 30°
 B. 45°
 C. 20°
 D. 35°
6. Which smallest number should be added in 454189 to make it a perfect square number?
- A. 68
 B. 92
 C. 87
 D. 58
7. The given histogram shows the number of workers of different age groups. Study the graph carefully and answer the given questions.



- (i) Which age group (in years) has the highest number of workers?
- (ii) Find the ratio of number of workers of age group 30-40 to that of 60-70.
- | | (i) | (ii) |
|----|-------|-------|
| A. | 30-40 | 2 : 3 |
| B. | 50-60 | 3 : 2 |
| C. | 60-70 | 4 : 3 |
| D. | 20-30 | 3 : 4 |
8. Factorisation of $2x^2 - 5\sqrt{5}x - 15$ is _____.
- A. $(x - \sqrt{5})(2x + 3\sqrt{5})$
- B. $(2x + \sqrt{5})(x - 3\sqrt{5})$
- C. $(2x - 3)(x + 2\sqrt{5})$
- D. $(x + 3\sqrt{5})(3x - \sqrt{5})$
9. If $x + y + z = 1$, $xy + yz + zx = -1$ and $xyz = -1$, then the value of $x^3 + y^3 + z^3$ is:
- A. -1
- B. 1
- C. 2
- D. -2
10. The number of faces in a polyhedron is 5 and total number of vertices is two-third of the total number of edges. Find the total number of vertices.
- A. 8
- B. 9
- C. 12
- D. 6
11. In the given figure, $DE \parallel QR$ and AP and BP are bisectors of $\angle EAB$ and $\angle RBA$ respectively. Find the measure of $\angle APB$.



- A. 70°
- B. 65°
- C. 90°
- D. 85°
12. Things which are equal to the same thing are _____ to one another.
- A. perpendicular
- B. not equal
- C. equal
- D. parallel

13. The ratio of two numbers is 7:5. If each number is decreased by 3, then their ratio becomes 3:2. Find the sum of both the numbers.
- A. 64
- B. 48
- C. 58
- D. 36
14. The area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm, is $k\sqrt{30}$ cm². Find the value of k .
- A. 8
- B. 6
- C. 7
- D. 9
15. Given below are the steps of construction of a quadrilateral $PQRS$, where $PQ = 5$ cm, $QR = 5.5$ cm and $RS = 7$ cm, $\angle PQR = 75^\circ$ and $\angle QRS = 45^\circ$. Which of the following steps is incorrect?
- Step 1:** Draw $QR = 5.5$ cm.
- Step 2:** Draw $\angle XQR = 75^\circ$ at Q and $\angle QRY = 45^\circ$ at R .
- Step 3:** With Q as centre and radius 5 cm, draw an arc to intersect QX at R .
- Step 4:** With R as centre and radius 7 cm, draw an arc to intersect RY at S .
- Join P to S . Thus, $PQRS$ is the required quadrilateral.
- A. Step 1 only
- B. Step 2 only
- C. Step 3 only
- D. Step 4 only

16. $ABCD$ is a parallelogram. If AB is produced to E such that ED bisects BC at O . Then which of the following is correct?
- A. $AB = OE$
- B. $AB = BE$
- C. $OE = OC$
- D. None of these
17. If $\frac{2x}{3} - \frac{4y}{5} = 4$ and $xy = 60$, then what will be the value of $\frac{4}{9}x^2 + \frac{16}{25}y^2$?
- A. 76
- B. 80
- C. 48
- D. 56

18. The point whose abscissa and ordinate have different signs will lie in:
- I and II quadrants
 - II and III quadrants
 - I and III quadrants
 - II and IV quadrants
19. If a and b both represent single digits in the number $3a9b94$, then for which of the following value of $(a + b)$, the given number will be divisible by 11?
- 7
 - 6
 - 9
 - 8
20. A cone, a hemisphere and a cylinder are formed on the same base and with same height. The ratio of their volumes is _____.
- 2 : 1 : 3
 - 1 : 2 : 3
 - 3 : 1 : 2
 - 1 : 3 : 2
21. If a solid sphere of radius 12 cm is moulded into 8 small spherical solid balls of equal radii, then the surface area of each ball is
- $45\pi \text{ cm}^2$
 - $108\pi \text{ cm}^2$
 - $144\pi \text{ cm}^2$
 - $124\pi \text{ cm}^2$
22. A shopkeeper marked 25% above the C.P. on an article and then gave a discount of 10% on that article. Find the profit percent of shopkeeper on that article.
- $15\frac{3}{4}\%$
 - $8\frac{1}{3}\%$
 - $9\frac{4}{5}\%$
 - $12\frac{1}{2}\%$
23. A triangular park has sides 120 m, 80 m and 50 m. A gardener has to plant grass inside. How much area is available for plantation?
- | | |
|------------------------------|-------------------------------|
| A. $180\sqrt{5} \text{ m}^2$ | B. $375\sqrt{15} \text{ m}^2$ |
| C. $270\sqrt{5} \text{ m}^2$ | D. $225\sqrt{15} \text{ m}^2$ |
24. In a hostel of 300 students, there is sufficient food for 24 days. Some students left the hostel and now the food lasts for 36 days, then how many students have left the hostel?
- 175
 - 150
 - 200
 - 100
25. The cost of a notebook is twice the cost of a pen. If the cost of a notebook is ₹ x and that of a pen is ₹ y , then a linear equation in two variables to represent the given condition is _____.
- $x + 2y = 0$
 - $x - 2y = 0$
 - $2x + y = 0$
 - $2x - y = 0$
26. A , B and C are three taps connected to a tank. A and B together fill the tank in 8 hours, B and C together fill it in 12 hours while A and C together fill the tank in 16 hours. In how much time A , B and C together fill up the tank?
- $9\frac{14}{13}$ hours
 - $9\frac{17}{13}$ hours
 - $8\frac{17}{13}$ hours
 - $7\frac{5}{13}$ hours
27. By walking at $\frac{5}{7}$ of his usual speed, a man reaches his office 14 minutes late than usual time. Find the usual time taken by him.
- 35 mins
 - 49 mins
 - 63 mins
 - 1 hr 12 mins
28. In a party, certain number of people were present. Each person contributed twice as many rupees as the total number of people. If the total contribution was ₹4418, then find the number of people present in the party.
- 36
 - 38
 - 41
 - 47

29. 8 children and 12 men complete a certain piece of work in 9 days. If each child takes twice the time taken by a man to finish the work, in how many days will 12 men finish the same work?

- A. 8 days
- B. 15 days
- C. 9 days
- D. 12 days

30. A rectangular field has an area $(14x^2 - 11x - 15) \text{ m}^2$. What could be the possible expression for length and breadth of the field?

- A. $(3x - 2) \text{ m}$ and $(5x + 8) \text{ m}$
- B. $(7x + 5) \text{ m}$ and $(2x - 3) \text{ m}$
- C. Both A and B
- D. None of these

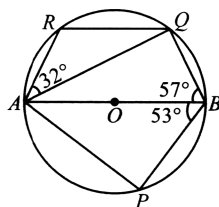
31. Read the following statements carefully and select the correct option.

Statement-I: The radius of a sphere is 10 cm. If the radius is increased by 5%, then the ratio of surface area of two spheres will be 40:41.

Statement-II: A right circular cone is 5.4 cm high and radius of its base is 3 cm. If it is melted and recast into another right circular cone with radius of base 1.5 cm, then the height of the new cone is 21 cm.

- A. Statement-I is true but Statement-II is false.
- B. Statement-I is false but Statement-II is true.
- C. Both Statement-I and Statement-II are true.
- D. Both Statement-I and Statement-II are false.

32. In the given figure (not drawn to scale), AB is the diameter of the circle with centre O . If $\angle ABQ = 57^\circ$, $\angle QAR = 32^\circ$ and $\angle ABP = 53^\circ$, then find:



- (i) the value of $\angle BQR$.
- (ii) the ratio of measure of $\angle BPA$ to $\angle BAQ$.

- | (i) | (ii) |
|----------------|-------|
| A. 140° | 12:7 |
| B. 135° | 24:13 |
| C. 150° | 8:5 |
| D. 115° | 30:11 |

33. Fill in the blanks and select the correct option.

- (i) If $(5^2)^7 = (125)^x$, then the value of x is P.
 - (ii) If $\sqrt{3} = 1.732$, then the approx. value of $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ is Q.
 - (iii) The value of $0.\bar{7} + 0.4\bar{7}$ is R.
- | (P) | (Q) | (R) |
|-----------|-------|----------|
| A. 7 | 0.732 | 7/90 |
| B. $14/3$ | 0.268 | $113/90$ |
| C. 4 | 0.414 | $43/90$ |
| D. $14/3$ | 1.732 | $4/9$ |

34. Solve the following questions and select the correct option.

- (i) If $(x + 1)$ and $(x - 1)$ are the factors of $px^3 + x^2 - 2x + q$, then find the value of $(p + q)$.
 - (ii) If $x^{\frac{1}{3}} + y^{\frac{1}{3}} + z^{\frac{1}{3}} = 0$, then find the value of $\frac{(x+y+z)^3}{xyz}$.
- | (i) | (ii) |
|-------|------|
| A. 1 | -36 |
| B. -7 | 64 |
| C. 1 | 27 |
| D. 4 | -125 |

35. Study the following statements carefully and select the correct option.

- P. For the linear equation $\frac{3x}{2} - \frac{y}{3} = \frac{-11}{6}$, $(-1, 1)$ is one of the solution.
 - Q. If $x = 3, y = \frac{7}{2}$ is the solution of linear equation $k - 3x - 2y = 0$, then the value of k is 17.
 - R. The abscissa of all the points on the y -axis is 0.
- A. Only P is true
 - B. Both P and Q are true
 - C. Only Q is true
 - D. Both P and R are true

SECTION - B : Science

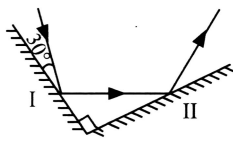
This section contains **40 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

36. A stone is thrown vertically upward with a velocity of 25 m s^{-1} from the top of a tower. It hits the ground after some time with a velocity of 90 m s^{-1} . The total time taken by the stone during this journey is (Take $g = 10 \text{ m s}^{-2}$)

A. 5.75 s
B. 5.0 s
C. 6.5 s
D. 11.5 s

37. Two mirrors I and II are placed perpendicular to each other. A ray of light is incident on mirror I as shown. Find the angle of reflection of the reflected ray from the mirror II.

A. 30°
B. 45°
C. 60°
D. 75°



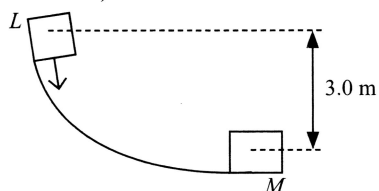
38. A helicopter of mass 2000 kg rises with a vertical acceleration of 15 m s^{-2} . The total mass of the crew and passengers is 500 kg . Select the correct statements from the following. (Take $g = 10 \text{ m s}^{-2}$)

- (i) The force on the floor of the helicopter by the crew and passengers is $1.25 \times 10^4 \text{ N}$, vertically downwards.
(ii) The action of the rotor of the helicopter on the surrounding air is $6.25 \times 10^4 \text{ N}$, vertically downwards.
(iii) The force on the helicopter due to the surrounding air is $6.25 \times 10^4 \text{ N}$, vertically upwards.

A. (i) and (ii) only
B. (ii) and (iii) only
C. (i) and (iii) only
D. (i), (ii) and (iii)

39. A block starts sliding down from point L as shown. Assuming the frictional force is negligible, what is the speed of the block when it reaches point M , if it travels 4.0 m along the track?

(Take $g = 10 \text{ m/s}^2$)



40. A source can produce waves of wavelength 100 mm in a medium X and of wavelength 0.25 cm in another medium Y . If the velocity of waves in medium X is 80 m s^{-1} , then the velocity of waves in medium Y is

A. 2 m s^{-1}
B. 4 m s^{-1}
C. 6 m s^{-1}
D. 8 m s^{-1}

41. When a conducting sphere A on an insulating stand, is brought near a positively charged light sphere B hanging from a nylon thread, the sphere B is attracted to A . Which of the following conclusions about the sphere A is correct?

A. Sphere A is neutral.
B. Sphere A is positively charged.
C. Sphere A is negatively charged.
D. Sphere A is either negatively charged or neutral.

42. Pressure at a point inside a liquid does not depend on

A. The nature of the liquid
B. Acceleration due to gravity at that point
C. Shape of the container
D. The depth of point below the surface of the liquid.

43. Read the given statements and select the correct option.

Statement 1 : Reducing the initial velocity to half the initial value, the stopping distance of a moving object decreases by a factor of 2 (for the same deceleration).

Statement 2 : Here, the stopping distance is proportional to the square of initial velocity.

A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Statement 1 is false but statement 2 is true.

44. Read the given statements and select the option that correctly identifies true (T) and false (F) ones.

- (i) The star Proxima Centauri is about $4 \times 10^{13} \text{ km}$ away from the Earth.
(ii) The stars appear to move from West to East from the Earth.
(iii) INSAT was the first Indian satellite.

- (iv) Meteor showers always occur at regular intervals each year.

(i) (ii) (iii) (iv)

- A. T F T T
 B. F T F F
 C. F F F T
 D. T F F F

45. Which of the following statements is/are true for the mass of the substance deposited at the cathode?

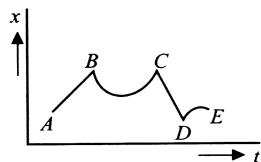
- (i) It is inversely proportional to quantity of electricity passed through electrolyte.
 (ii) It is directly proportional to quantity of electricity passed through electrolyte.
 (iii) It is directly proportional to the time for which electricity is passed through the electrolyte.
 (iv) It is inversely proportional to the time for which electricity is passed through the electrolyte.

- A. (i) only
 B. (ii) and (iii) only
 C. (ii) and (iv) only
 D. (i) and (iii) only

46. A body when floats in water, $\left(\frac{1}{4}\right)^{\text{th}}$ of its volume remains outside water. When it floats in another liquid, half of its volume remains outside the liquid. Then the density of the liquid is

- A. $\frac{3}{4}$ gm/cc
 B. $\frac{4}{3}$ gm/cc
 C. $\frac{3}{2}$ gm/cc
 D. $\frac{8}{3}$ gm/cc

47. Figure shows the displacement(x) of a particle going along the x -axis as function of time(t). The force acting on the particle is zero in the region



- A. AB
 B. BC
 C. CE
 D. DE

48. Which of the following represents the correct increasing order of the rigidity of the given substances?

- A. Milk < Nitrogen < Book
 B. Stone < Oxygen < Oil
 C. Alcohol < Salt < Carbon dioxide
 D. Hydrogen < Petrol < Wooden block

49. Soham, a class 9 student mixed some iron filings and sulphur in a China dish and heated them strongly to obtain a residue. Which of the following is not a characteristic property of the residue?

- A. It cannot be separated into sulphur and iron filings by normal physical methods.
 B. Its properties are completely different from iron and sulphur.
 C. Its composition is same throughout.
 D. Its appearance is different from iron and sulphur but it shows chemical properties of both iron and sulphur.

50. Which of the following solutions has the highest mass by volume percentage?

- A. 10 g of sugar in 50 mL solution
 B. 25 g of potassium chloride in 100 mL solution
 C. 30 g of magnesium sulphate in 50 mL solution
 D. 60 g of sodium chloride in 200 mL solution

51. A brief information about three different fibres is given below:

X : Lustrous fibre used to make car seat belts and sleeping bags.

Y : A polyester which can be drawn into very fine fibres that can be woven like any other yarn.

Z : Can replace natural wool to make clothes for winter.

Identify X, Y and Z.

- | | X | Y | Z |
|----|---------|----------|---------|
| A. | Rayon | PET | Nylon |
| B. | Rayon | Terrycot | Acrylic |
| C. | Acrylic | Terylene | Rayon |
| D. | Nylon | Terylene | Acrylic |

52. Which of the following statements are incorrect?

- I. Carbonate ion is a polyatomic ion that carries a charge of -2 .
 II. Sulphide ion is trivalent and positive.
 III. Argon and oxygen are monoatomic and diatomic gases respectively.
 IV. Ammonium ion is negatively charged and carries a single negative charge only.

- A. II and IV only
 B. I and III only
 C. I and II only
 D. III and IV only

53. Ritu has classified some substances on the basis of their physical properties. Identify the substances whose properties are not mentioned correctly.

Substance	Hard	Malleable	Lustrous
Gold	✓	✓	✗
Coal	✗	✓	✓
Copper	✓	✓	✓
Aluminium	✗	✗	✓
Phosphorus	✗	✗	✗

- A. Gold, copper and phosphorus
 B. Coal, aluminium and phosphorus
 C. Gold, coal and aluminium
 D. Copper and phosphorus
54. Read the given passage and fill in the blanks by selecting an appropriate option.
 (i) was formed from organisms living in the sea. The process of separating the various constituents/fractions of (i) is called (ii). (iii) is used as a solvent for dry cleaning.

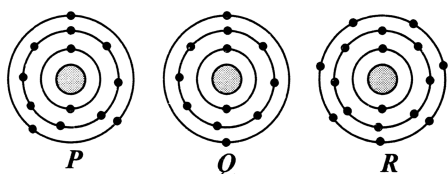
(i)	(ii)	(iii)
A. Coal	Carbonisation	Coal tar
B. Petroleum	Refining	Petrol
C. Coal	Refining	Bitumen
D. Petroleum	Carbonisation	Kerosene

55. P and Q are two atomic species :

Atom	Number of protons	Number of electrons	Number of neutrons
P	12	12	12
Q	12	12	14

Select the correct statement about P and Q .

- A. P and Q are isobars.
 B. P and Q are atoms of different elements.
 C. P and Q are isotopes.
 D. The chemical properties of P and Q are different but their physical properties are same.
56. The distribution of electrons in the outermost shells of three elements P , Q and R is shown in the given figure.



The formulae of compounds formed by P and Q with

- A. PR_2 and QR_3
 B. PR and QR_2
 C. PR_3 and QR_2
 D. P_2R and QR_3

57. Read the given statements and select the correct option.

Statement 1 : When a fire brigade arrives, it pours water on the fire.

Statement 2 : Water cools the combustible material so that its temperature is brought above its ignition temperature.

- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1.
 B. Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true but statement 2 is false.
 D. Both statement 1 and statement 2 are false.

58. Which of the given statements is not a function of plasma membrane?

- A. It maintains individuality of the cell.
 B. It is impermeable therefore it prevents cell contents to mix with its environment.
 C. Its junctions help to keep the cells together.
 D. It protects the cell from injury.

59. Ananya was asked by her teacher to write few points on phagocytosis. She wrote few statements. However, one statement is incorrect. Identify the incorrect statement(s) and select the correct option.

- I. It is the intake of extracellular particles.
 II. It is a nutritive and defensive process.
 III. Microfilaments play no role in it.
 IV. Cell membrane grows around the particle as pseudopodia.
- A. I and II only
 B. IV only
 C. II and III only
 D. III only

60. Which among the following is a complex permanent tissue in plants?

- A. Xylem
 B. Parenchyma
 C. Sclerenchyma
 D. Collenchyma

61. Read the given statements and select the correct option.

Statement 1 : Each smooth muscle fibre is long, spindle shaped, tapering and uninucleate.

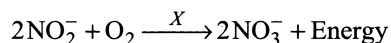
Statement 2 : Smooth muscle fibres show transverse striations and occur in the wall of tubular organs.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true but statement 2 is false.
 D. Both statements 1 and 2 are false.

62. Which among the following is not used in organic farming?

- A. *Anabaena*
 B. *Clostridium botulinum*
 C. Neem leaves
 D. Cyanobacteria

63. Refer to the given equation and select the microorganism(s) that can be correctly placed at X.



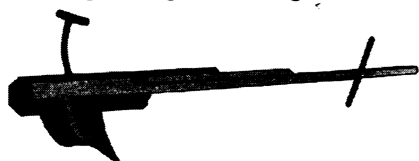
- A. *Nitrobacter*
 B. *Penicillium*
 C. *Nitrocystis*
 D. All of these

64. Read the given statements and fill in the blanks by selecting the correct option.

- (i) _____ is a kind of manure that is prepared by degrading the dung of farm animals, domestic waste and other organic debris.
 (ii) Fertilisers are rich in _____.
 (iii) Absorption of manures by plants is _____ in comparison to fertilisers.

(i)	(ii)	(iii)
A. Compost	Nitrogen	Slow
B. Compost	Calcium	Fast
C. Green manure	Nitrogen	Slow
D. Farmyard manure	Magnesium	Fast

65. Refer to the given figure of an agricultural implement.



This implement is used to

- A. Sow seeds at a proper distance
 B. Separate grains from the harvested crop
 C. Plough the soil and remove weeds
 D. Separate grains from the chaff.

66. Select the incorrect match.

Name of National Park	Organism for which it is known
A. Kanha National Park	– Great Indian Bustard
B. Sundarbans	– Royal Bengal tiger
C. Desert National Park	– Chinkara
D. Corbett National Park	– Tiger

67. Given below are names of few cell organelles.

Ribosome, Vacuole, Mitochondria, Plastids, Lysosome

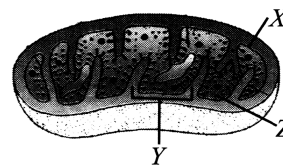
How many of these are present only in plant cells?

- A. 1
 B. 2
 C. 3
 D. 4

68. _____ regulates calcium and phosphate balance in the body.

- A. Adrenal gland
 B. Pancreas
 C. Parathyroid gland
 D. Pineal gland

69. Refer to the given figure and select the incorrect statement regarding X, Y and Z.



- A. X is freely permeable to small molecules and ions.
 B. Y is arranged in characteristic pattern in different cells and bear oxysomes.
 C. Z contains respiratory enzymes, lipids, RNA, etc.
 D. None of these

70. The phenomenon of increase in concentration of non-biodegradable organic compounds with each trophic level in a food chain is called

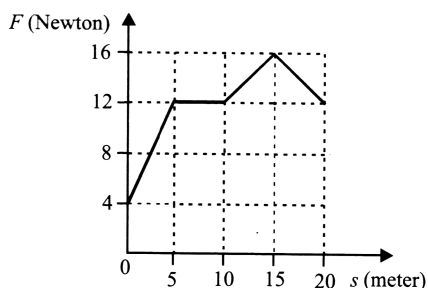
- A. Biological evolution
 B. Bioenlargement
 C. Biological fixation
 D. Biomagnification.

71. Fill in the blanks by selecting an appropriate option.

Every object in the universe attracts every other object with a force which is directly proportional to the product of their masses and (i) proportional to the (ii) of the distance between them. If an object of mass 1 kg is placed on the surface of the Earth, gravitational force of attraction between the object and the Earth is (iii) N. If two objects are of different masses and the distance between them is decreased by 10%, then the percentage change in the gravitational force between the two objects is about (iv).

	(i)	(ii)	(iii)	(iv)
A.	Inversely	Square	9.8	28.5
B.	Inversely	Square	9.8	23.5
C.	Inversely	Square root	98	25
D.	Directly	Square	98	35.5

72. Figure shows the frictional force (F) versus displacement (s) graph for a particle in motion. The loss of kinetic energy (work done against friction) in travelling over $s_1 = 10$ m to $s_2 = 20$ m will be



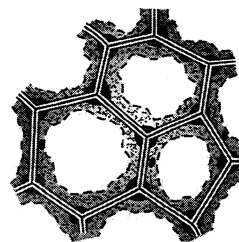
- A. 80 J
B. 140 J
C. 240 J
D. 20 J

73. Read the given passage where few words are italicised and select the correct statement regarding them.

The term cell was coined by *Robert Hooke* in 1665. Cells that lack a well defined nucleus and membrane bound organelles are called *prokaryotic* cells whereas cells that have a well defined nucleus and membrane bound organelles are called *eukaryotic* cells. *Bacterial* cells are prokaryotic cells whereas *animal* cells are eukaryotic cells.

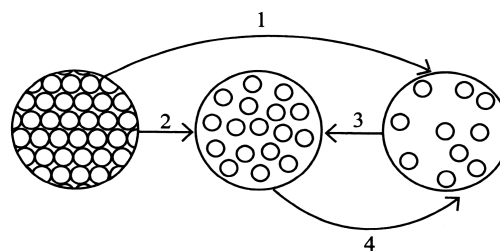
- A. *Robert Hooke* must be replaced with *Robert Brown*.
B. *Prokaryotic* should be interchanged with *eukaryotic*.
C. *Animal* must not be changed as it is correctly mentioned.
D. *Bacterial* must be replaced with *plant*.

74. The given figure is of a type of plant tissue. Identify it and select the incorrect statement regarding its function.



- A. Cells of this tissue can manufacture sugar and store it as starch.
B. It provides mechanical support and elasticity to the young dicotyledonous stem.
C. It allows easy bending in leaves and young stems.
D. It forms protective covering in seeds and nuts.

75. The following figure shows the changes in the three states of matter of a substance X.



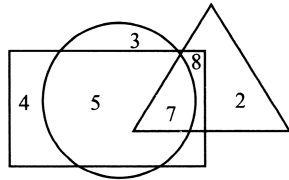
Select the incorrect statements about these changes.

- I. Change 1 requires a decrease in temperature and an increase in pressure and is also called sublimation.
II. Change 3 can be carried out by decreasing pressure and increasing temperature.
III. Change 2 can be brought by heating the given substance.
IV. Change 4 can be carried out in the presence of heat.
- A. I and IV only
B. II and III only
C. I and II only
D. III and IV only

SECTION - C : Logical Reasoning

This section contains **25 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

76. In the given Venn diagram, rectangle represents scientists, circle represents people worked in NASA and triangle represents people worked in ISRO. Which of the following number represents scientists who worked only in ISRO?



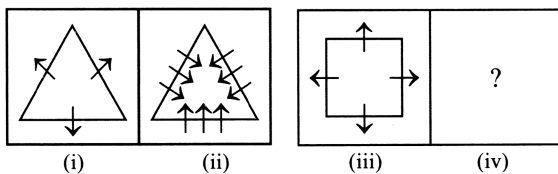
- A. 7
- B. 8
- C. 2
- D. 5

77. Find the missing number in the given number series.

4, 15, 48, 147, ?, 1335

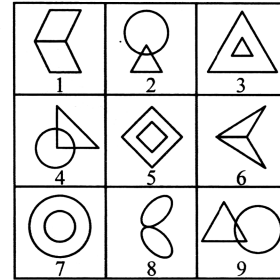
- A. 364
- B. 441
- C. 426
- D. 444

78. There is a definite relationship between figures (i) and (ii). Establish a similar relationship between figures (iii) and (iv) by selecting a suitable figure from the options that would replace the (?) in fig. (iv).



- A.
- B.
- C.
- D.

79. Group the given figures into three classes on the basis of their identical properties by using each figure only once.

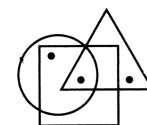


- A. 1, 6, 8; 2, 5, 9; 3, 4, 7
- B. 1, 5, 7; 2, 4, 6; 3, 8, 9
- C. 1, 6, 8; 2, 4, 9; 3, 5, 7
- D. 1, 3, 7; 2, 5, 9; 4, 6, 8

80. Vikrant walks 70 m to the East, then turns to his left and walks 60 m, then he turns left again and walks 20 m. Finally he turns towards right and walks 60 m. How far and in which direction is he now from the starting point?

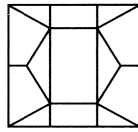
- A. 120 m, South-West
- B. 130 m, North
- C. 130 m, North-East
- D. 120 m, South-East

81. Select a figure from the options which satisfies the same conditions of placement of the dots as in the given figure.



- A.
- B.
- C.
- D.

82. Which of the following figures is exactly embedded in the given figure as one of its parts?



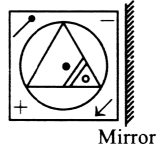
- A.
- B.
- C.
- D.

83. How many 7's are there in the given series each of which is immediately preceded by an even number and immediately followed by 5?

6 4 7 5 8 1 7 5 2 7 6 7 5 3 9 7 4 7 8 7 5 6

- A. Two
- B. One
- C. Three
- D. Four

84. Select the correct mirror image of the given figure.



- A.
- B.
- C.
- D.

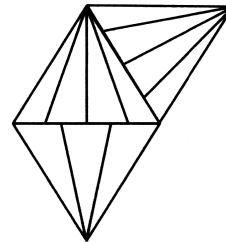
85. If in a certain code language, GUIDELINES is written as GFKWIUGPKN, then how will SEPARATELY be written in the same code language?

- A. TBRHUANWCD
- B. UCRGVBNBVC
- C. TCRGUANGVC
- D. UBRIUBNHVC

86. If '@' stands for '+', '©' stands for '-', '\$' stands for '÷' and '#' stands for '×', then what is the value of $24©65\$13@16\#5$?

- A. 99
- B. 87
- C. 109
- D. 61

87. Find the number of triangles formed in the given figure.



- A. 20
- B. 19
- C. 18
- D. More than 20

88. How many pairs of letters are there in the word APPOINTMENT each of which has as many letters between them in the word as in the English alphabets?

- A. None
- B. One
- C. Three
- D. Four

89. Study the given information and answer the following question.

P * Q means P is the sister of Q.

P % Q means P is the father of Q.

P \$ Q means P is the brother of Q.

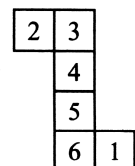
P + Q means P is the mother of Q.

Then how will H be related to G in $H\%E*D\$G$?

- A. Brother
- B. Father
- C. Mother
- D. Uncle

90. Which of the following numbers lie on the face opposite to the face having number 6 when the given net is folded to form a cube?

- A. 2
- B. 4
- C. 1
- D. 5



91. Read the following information carefully and answer the given question.

'A @ B' means 'A is father of B'.

'A + B' means 'A is son of B'.

'A \$ B' means 'A is daughter of B'.

'A % B' means 'A is mother of B'.

'A & B' means 'A is husband of B'.

How is P related to T in the given expression?

$$P \% Q + R @ S \& T$$

- A. Mother
- B. Sister
- C. Father-in-law
- D. Mother-in-law

92. If all the C's are dropped from the given arrangement, then which of the following will be 5th to the left of 3rd letter from the right end?

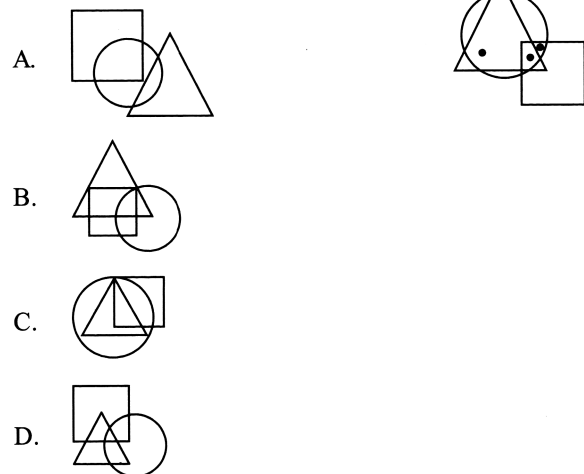
AUBCEDEUCBEBBCUADBACUBUAC

- A. U
- B. A
- C. B
- D. D

93. If 'A' stands for '+', 'B' stands for '-', 'C' stands for '×' and 'D' stands for '÷', then $28 B 14 D 2 C 7 A 24 = \underline{\hspace{1cm}}$.

- A. 0
- B. 1
- C. 2
- D. 3

94. Select a figure from the options which does not satisfy the same conditions of placement of the dots as in the given figure.

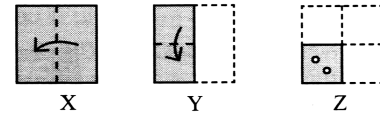


95. In the given letter series, some of the letters are missing which are given in that order as one of the options below it. Select the correct option.

DB _ ADB _ AD _ C _ DB _ A

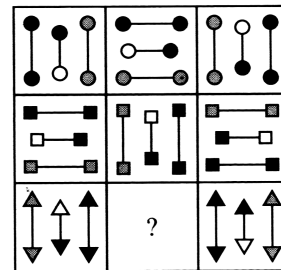
- A. CCBCA
- B. CCBAC
- C. CBCAC
- D. CACBC

96. The given question consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. Select a figure from the options which would most closely resemble the unfolded form of fig. (Z).



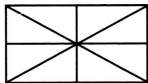
- A.
- B.
- C.
- D.

97. Which of the following options will complete the given figure matrix?



- A.
- B.
- C.
- D.

98. Count the number of triangles formed in the given figure.



- A. 12
- B. 13
- C. 14
- D. More than 14

99. Arrange the given words in a logical sequence and select the correct option.

- | | |
|--------------|--------------|
| 1. Patient | 2. Recover |
| 3. Doctor | 4. Treatment |
| 5. Diagnosis | |

- A. 1, 3, 4, 5, 2
- B. 1, 3, 5, 4, 2
- C. 1, 3, 2, 4, 5
- D. 1, 3, 2, 5, 4

100. Sahil is facing towards South. After turning right, he walks 20 m. Then he turns right again and walks 30 m. After that he turns right again and walks 60 m. How far is Sahil now from the starting point?

- A. 50 m
- B. 30 m
- C. 40 m
- D. None of these

Space for rough work

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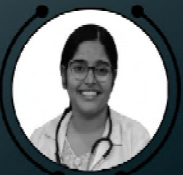
SHREYANSH JAISWAL
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