

TEST ID : 101
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 X 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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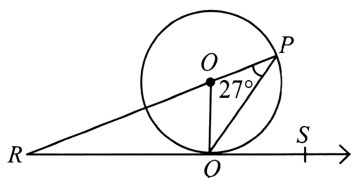
SECTION - A : Math

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. A two-digit number is such that, it exceeds the number formed by reversing the digits by 9. Also, the sum of the digits of the number is 7. Find the product of the digits.

- A. 12
- B. 18
- C. 8
- D. None of these

2. In the given figure (not drawn to scale), if O is the centre of the circle with $\angle QPR = 27^\circ$, then find the value of $\angle SQP$.



- A. 46°
- B. 63°
- C. 38°
- D. 54°

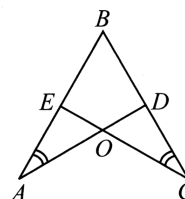
3. Find the value of $\frac{[(676)^{1/2}]^4}{[(2197)^{1/3}]^4}$.

- A. 25
- B. 32
- C. 16
- D. 8

4. If P and Q are two positive integers such that $P = x^2y^3$ and $Q = xy^2$, where x, y are prime numbers, then HCF (P, Q) is

- A. x^2y
- B. xy^2
- C. x^2y^3
- D. x^2y^2

5. In given figure (not drawn to scale), $\angle A = \angle C$ and $AB = BC$. Then which of the following options is correct?

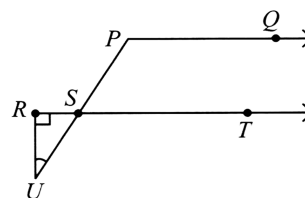


- A. $\angle OEB = \angle ODB$
- B. $\triangle ABD \cong \triangle CBE$
- C. $\angle AEO = \angle CDO$
- D. All of these

6. In what ratio is the line segment joining the points $(-3, 2)$ and $(6, 1)$ is divided by Y -axis?

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

7. In the given figure (not drawn to scale), if $PQ \parallel ST$ and $\angle RUS = 37^\circ$, then find the measure of $\angle SPQ$.

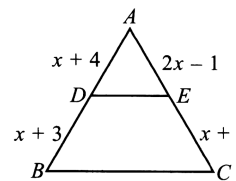


- A. 147°
- B. 123°
- C. 127°
- D. 143°

8. Determine the value of α , for which the quadratic equation $x^2 + (2\alpha - 1)x + \alpha^2 = 0$ has equal roots.

- A. $\frac{1}{4}$
- B. $\frac{3}{4}$
- C. $\frac{7}{8}$
- D. $\frac{2}{5}$

9. The height of a building is half the height of the tower on it. The angle of elevation of the top of the building as seen from a point on the ground is 30° . Find the angle of elevation of the top of the tower as seen from the same point.
- A. 45°
 B. 60°
 C. 30°
 D. None of these
10. The semi-perimeter and two sides of a triangle are 21 cm, 14 cm and 15 cm respectively. Find the area of the triangle.
- A. 136 cm^2
 B. 98 cm^2
 C. 105 cm^2
 D. 84 cm^2
11. If one root of the polynomial $f(x) = 3x^2 + 11x + p$ is reciprocal of the other, then the value of p is
- A. 0
 B. 3
 C. $\frac{1}{3}$
 D. -3
12. The construction of a ΔPQR in which $QR = 6.4$ cm and $\angle Q = 60^\circ$ is not possible when $(PQ + PR)$ is
- A. 6 cm
 B. 6.5 cm
 C. 8 cm
 D. 7 cm
13. Two A.P.'s have the same common difference. The first term of one of the A.P. is 12 and that of the other A.P. is 9. Find the difference between their 30th term.
- A. 7
 B. 4
 C. 6
 D. 3
14. If $x = a(\sec\theta + \tan\theta)$ and $y = b(\tan\theta - \sec\theta)$, then
- A. $xy - ab = 0$
 B. $xy + ab = 0$
 C. $\frac{x}{a} + \frac{y}{b} = 1$
 D. $x^2y^2 = ab$
15. The probability of getting a good pen in a lot of 380 pens is 0.75. The number of bad pens in the lot is
- A. 80
 B. 120
 C. 95
 D. 135
16. A right circular cone of height 7 cm and base radius 9 cm is removed from a solid cylinder of same height and same base. Find the volume of remaining solid.
- A. 876 cm^3
 B. 1324 cm^3
 C. 1244 cm^3
 D. 1188 cm^3
17. In a parallelogram $ABCD$, if $\angle A = (3x - 20)^\circ$, $\angle B = (y + 15)^\circ$ and $\angle C = (x + 40)^\circ$, then the values of x and y respectively are
- A. 30, 95
 B. 95, 30
 C. 60, 30
 D. 30, 60
18. The area of a sector of radius 2.8 cm is 3.08 cm^2 . Find the central angle of the sector.
- A. 60°
 B. 45°
 C. 75°
 D. 70°
19. The following data is arranged in ascending order. If the mean of the given data is 36, then find the value of x .
- 17, 23, 31, 33, $x + 3$, 37, 41, 43, 48
- A. 34
 B. 31
 C. 32
 D. 48
20. In the given figure (not drawn to scale), $DE \parallel BC$. Find the value of x .



- A. $\sqrt{5}$
 B. $\sqrt{6}$
 C. $\sqrt{3}$
 D. $\sqrt{7}$

21. The top of a broken tree has its top end touching the ground at a distance 15 m from the bottom, the angle made by the broken end with the ground is 30° . Then the length of broken part is
- A. 10 m
B. $\sqrt{3}$ m
C. $5\sqrt{3}$ m
D. $10\sqrt{3}$ m
22. There are two cylinders P and Q , the ratio of the height of P to that of Q is $5 : 2$ and ratio of the radius of P to that of Q is $4 : 3$. Then, the ratio of the volume of P to that of Q is
- A. $31 : 21$
B. $21 : 13$
C. $40 : 9$
D. $14 : 13$
23. A bag contains 9 green balls and some pink balls. If the probability of drawing a pink ball is four times the probability of drawing a green ball, then find the number of pink balls in the bag.
- A. 24
B. 28
C. 36
D. 42
24. A car travels a distance of 288 km at a uniform speed. If the speed had been 4 km/h less, then it would have taken 1 hour more to cover the same distance. Find the speed of the car.
- A. 36 km/hr
B. 42 km/hr
C. 32 km/hr
D. 48 km/hr
25. A cricketer has a mean score of 48 runs in 12 innings. How many runs he need to score in the thirteenth inning so that the mean score becomes 54?
- A. 163
B. 97
C. 148
D. 126
26. A horse is tethered to one corner of a rectangular grass field 57 m by 53 m by a 5.6 m long rope. Over how much area of the field can it graze?
- A. 32.54 m^2
B. 24.64 m^2
C. 18.72 m^2
D. 42.46 m^2
27. Find the cost of laying grass in a triangular field of sides 30 m, 24 m and 18 m at the rate of ₹ 15 per m^2 .
- A. ₹ 3240
B. ₹ 2850
C. ₹ 4280
D. ₹ 3650
28. Mohan says to Sushant, "If you give me ₹ 700, I shall be twice as rich as you." But Sushant says to Mohan, "If you give me ₹ 300, I shall be thrice as rich as you." Find the amount that Sushant have.
- A. ₹ 1200
B. ₹ 1300
C. ₹ 1400
D. ₹ 1500
29. The production of TV in a factory increases uniformly by a fixed number every year. It produced 8000 sets in 6th year and 11300 in 9th year. Find the total production of TVs in the 6 years.
- A. 40500
B. 20000
C. 20500
D. 31500
30. The present age of Meena is 8 times the age of her daughter. 8 years hence, the ratio of ages of Meena and her daughter will be $10 : 3$. What is the present age of Meena?
- A. 32 years
B. 36 years
C. 40 years
D. Cannot be determined

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

Statement-I : $\operatorname{cosec}^2\theta + \sec^2\theta = (\operatorname{cosec}\theta \cdot \sec\theta)^2$

Statement-II : If $\cos^2\theta - \sin^2\theta = \tan^2\theta$, then

$$\sec^2\theta = \sqrt{3}.$$

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

(i) If the system of equations $2x + 3y = 5$; $4x + ky = 10$ has infinite many solutions, then the value of k is P.

(ii) The value of $x + y$ for the system of equations $2x - \frac{3y}{4} = 3$; $5x = 2y + 7$ is Q.

- | | P | Q |
|----|----------|----------|
| A. | 8 | 9 |
| B. | 7 | 6 |
| C. | 9 | 8 |
| D. | 6 | 7 |

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

- (i) Determine the first term of the AP, whose fifth term is 19 and the difference of the eighth term from the thirteenth term is 20.
 (ii) How many two-digit numbers are there, which when divided by 4 yield 3 as remainder?

- | | (i) | (ii) |
|----|------------|-------------|
| A. | 5 | 22 |
| B. | 3 | 23 |
| C. | 11 | 28 |
| D. | 13 | 27 |

34. Read the following statements carefully and state 'T' for true and 'F' for false.

- (i) If $x = a$ is the solution of the equation $x^2 - (a + b)x + k = 0$, then the value of k is a/b .
 (ii) If $a^2b^2x^2 + 2abx + 1 = 0$, then one of the solution of the equation is $x = -ab$.
 (iii) The nature of roots of the equation $3x^2 - 6\sqrt{2}x + 2 = 0$ is real and distinct.

- | | (i) | (ii) | (iii) |
|----|------------|-------------|--------------|
| A. | T | T | T |
| B. | F | T | T |
| C. | F | F | T |
| D. | F | T | F |

35. If a card is drawn from a well-shuffled deck of 52 playing cards, then which of the following is incorrect?

- A. The probability of getting a jack of red colour is $\frac{1}{26}$.
 B. The probability of getting a face card is $\frac{3}{13}$.
 C. The probability of getting an ace is $\frac{1}{4}$.
 D. None of these

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.

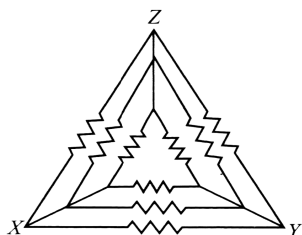
36. Read the given statements and select the correct option.

Statement 1 : Magnification of a convex mirror is always positive, but for a concave mirror it may be positive or negative.

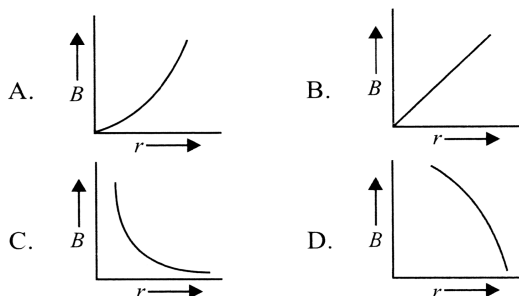
Statement 2 : Sign of magnification for a mirror depends upon the sign convention chosen.

- 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.
37. A satellite of mass 300 kg revolves around the Earth in an orbit of radius $3/2 R_E$, where R_E is the radius of the Earth. Assuming the gravitational pull on a mass of 1 kg on Earth's surface is 10 N, the pull on the satellite will be
- A. 1000 N B. 1333 N
 C. 1200 N D. 8000 N

38. Nine resistors each of resistance R are arranged as shown below. The effective resistance between X and Y is



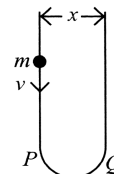
- A. $\frac{2}{9}R$ B. $2R$
 C. R D. $\frac{3}{5}R$
39. The graph showing the variation of the magnetic field strength (B) with distance (r) from a long current carrying conductor (thin), is



40. A trolley of mass 200 kg is carrying a sandbag of mass 25 kg, is moving uniformly with a speed of 25 km h^{-1} on a frictionless track. After a while, the sand starts leaking out of a hole on the floor of the trolley at the rate of 0.05 kg s^{-1} . The speed of the trolley after the entire sand bag becomes empty, is

- A. 5 km h^{-1} B. 10 km h^{-1}
 C. 15 km h^{-1} D. 25 km h^{-1}

41. A U shaped smooth wire has a semicircular bending between points P and Q as shown in the given figure. A bead of uniform mass m moving with uniform speed v through the wire, reaches the semicircular bend at P and leaves at Q . Find the average force exerted by the bead on part PQ of the wire.



- A. $\frac{2mv^2}{\pi x}$ B. $\frac{4mv^2}{\pi x}$
 C. $\frac{mv^2}{\pi x}$ D. mv^2x

42. When a magnetic compass needle is carried near to a straight wire carrying current, then

- (i) The straight wire causes a noticeable deflection in the compass needle.
 (ii) The alignment of the needle is tangential to an imaginary circle with straight wire at its centre and has a plane parallel to the wire.

- A. Only (i) is correct
 B. Only (ii) is correct
 C. Both (i) and (ii) are correct
 D. Neither (i) nor (ii) is correct.

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

Statement 1 : We can decide the nature of a mirror by observing the size of an erect image in the mirror.

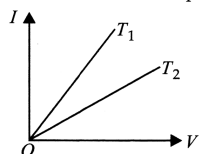
Statement 2 : The minimum distance between a real object and its real image in a concave mirror is zero.

- 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.

44. In the game of blindfold, a boy after walking every 10 steps in one direction each of length 80 cm, turns randomly to the left or right by 90° . After walking a total of 60 steps, the maximum displacement of the boy from its starting point can be

A. Zero
B. $24\sqrt{2}$ m
C. 16 m
D. $16\sqrt{2}$ m

45. The voltage V and current I graphs of a conductor at two different temperatures T_1 and T_2 are shown in the figure. The relation between T_1 and T_2 is



A. $T_1 > T_2$
B. $T_1 < T_2$
C. $T_1 = T_2$
D. $T_1 = \frac{1}{T_2}$

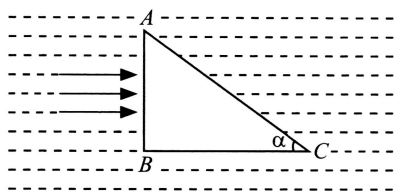
46. Read the given statements and select the correct option.

Statement 1 : The sound emitted by a source is uniform in all directions.

Statement 2 : During propagation of sound waves, energy and matter both transfer from one point to the other.

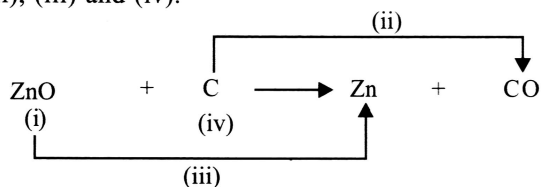
- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Both statements 1 and 2 are false.

47. A beam of light is incident normally on a prism ($\mu = \frac{3}{2}$), also the prism is immersed in a liquid as shown in the figure. The largest value of the angle α , so that a ray is totally reflected at the face AC is 30° . Refractive index of the given liquid is



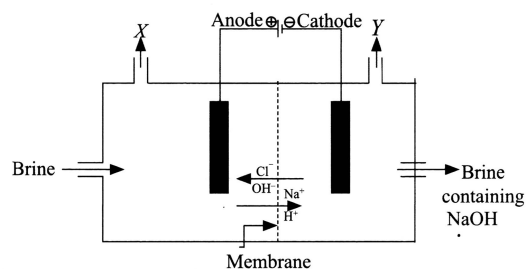
A. $\frac{\sqrt{3}}{2}$
B. $\frac{3}{4}$
C. $\frac{4}{3}$
D. $\frac{3\sqrt{3}}{4}$

48. Observe the given reaction carefully and identify (i), (ii), (iii) and (iv).



- | (i) | (ii) | (iii) | (iv) |
|------------------------|-----------|-----------|---------------------|
| A. Undergoes oxidation | Oxidation | Reduction | Undergoes reduction |
| B. Reducing agent | Reduction | Oxidation | Oxidising agent |
| C. Oxidising agent | Oxidation | Reduction | Reducing agent |
| D. Undergoes reduction | Reduction | Oxidation | Undergoes oxidation |

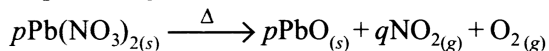
49. Observe the following figure carefully.



Now, select the incorrect statements.

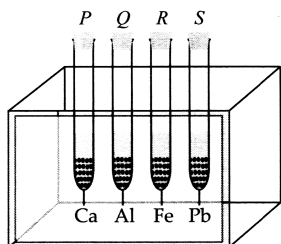
- I. The given experimental set-up shows the formation of baking soda through chlor-alkali process.
II. The gas X liberated at anode is H_2 while the gas Y liberated at cathode is Cl_2 .
III. In the given process, electricity is passed through an aqueous solution of sodium chloride.
IV. Sodium hydroxide solution is formed near the anode.
- A. I and III only
B. II and IV only
C. I, II and IV only
D. II, III and IV only
50. Rutherford made some observations when he bombarded a thin sheet of gold foil with α -particles. Which of the following observations is incorrect?
- A. Most of the fast moving α -particles were deflected by the foil by small angles.
B. Nearly 99% of the α -particles passed straight through the gold foil without getting deflected from their original path.
C. One out of every 12000 particles appeared to rebound.
D. A few alpha particles were deflected by the foil by small angles.

51. p and q in the given reaction are respectively



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

52. Nikita, a Class 10th student set up the following apparatus to study the reaction of metals with acids based on their reactivities.



She observed that the rate of evolution of bubbles of hydrogen gas is not same in all the test tubes. Based on this observation, select the correct statements.

- I. The rate of evolution of H_2 gas bubbles must be the highest in test tube P and lowest in test tube S .
II. The order of reactivity of metals is $\text{Ca} > \text{Fe} > \text{Al} > \text{Pb}$.
III. Hydrogen gas bubbles evolve faster in test tube S as compared to test tube R .
IV. The rate of evolution of H_2 gas bubbles is higher in test tube Q than in test tube R .
- A. II and III only B. I and IV only
C. I and II only D. III and IV only

53. Select the incorrect match.

- A. Cream from milk – Centrifugation
B. Different components of a food sample – Chromatography
C. Mixture of acetone and water – Separating funnel
D. Separation of crystals of alum from impure sample – Crystallisation

54. Read the given statements carefully and select the option that correctly identifies these statements as true (T) and false (F) ones.

- I. Metals of low reactivity can be extracted from their ores via heating alone.
II. Metals of medium reactivity can be extracted from their ores via electrolysis.
III. The carbonate ores are changed into oxides by heating strongly in the presence of excess air.

I II III

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

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

Statement 1 : Ethanol when heated with alkaline KMnO_4 , produces ethanoic acid.

Statement 2 : Alkaline potassium permanganate (KMnO_4) is an oxidising agent that adds oxygen to ethanol, thereby, oxidising it to ethanoic acid.

- 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.

56. Which of the following statements are correct?

- I. 48 g of He contains more number of moles than 23 g of Na.
II. 8 g of O_2 contains 2.5×10^{23} O_2 molecules.
III. The mass of 4.8 moles of nitrogen atoms is 87.2 g.
IV. 0.1 moles of carbon atoms contain 6.022×10^{22} carbon atoms.
- A. I and III only
B. II and III only
C. I and IV only
D. II and IV only

57. In a compound such as ammonia, the ratio of the mass of nitrogen to the mass of hydrogen is always 14 : 3 irrespective of the source of ammonia. The above statement illustrates

- A. Law of multiple proportions
B. Law of chemical combination
C. Law of constant proportions
D. Law of conservation of mass.

58. Salt X on heating gives Y which is a common constituent of washing powder and a gas Z which turns lime water milky. Identify X , Y and Z .

	X	Y	Z
A.	Sodium carbonate	Water	Carbon monoxide
B.	Sodium hydrogen carbonate	Sodium carbonate	Carbon dioxide
C.	Sodium carbonate	Sodium chloride	Carbon dioxide
D.	Sodium hydrogen carbonate	Calcium carbonate	Hydrogen

59. The mass number of an atom whose dipositive ion has 10 electrons and 12 neutrons is

- A. 22 B. 23
C. 25 D. 24

60. Which among the following is not a dominant trait studied by Mendel?

- A. Tall stem
B. Terminal position of flower on stem
C. Yellow colour of the seed
D. Violet colour of flower

61. Which of the following statements is/are correct?

- (i) Sudden reaction in response to a stimulus is called reflex action.
(ii) Sensory neurons carry signals from spinal cord to muscles.
(iii) Motor neurons carry signals from receptors to spinal cord.
- A. (i) and (ii) only B. (i) and (iii) only
C. (i) only D. (i), (ii) and (iii)

62. *X* and *Y* are plant hormones. Hormone *X* induces ripening of fruits whereas hormone *Y* induces bolting in case of rosette plant.

Select the option that correctly identifies *X* and *Y*.

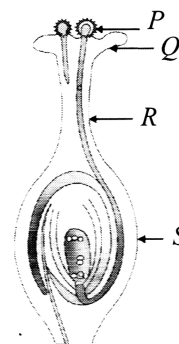
- | <i>X</i> | <i>Y</i> |
|----------------|---------------|
| A. Cytokinin | Abscisic acid |
| B. Ethylene | Gibberellin |
| C. Gibberellin | Cytokinin |
| D. Auxin | Abscisic acid |

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

- I. Umbilical cord serves as a link between embryo and the placenta.
II. Process by which a gastrula changes to blastocyst is called gastrulation.
III. Scrotum acts as a thermoregulator and provides an optimal temperature for the formation of sperms.
IV. Progesterone is released from the anterior pituitary and stimulates the uterus to maintain its thickening.

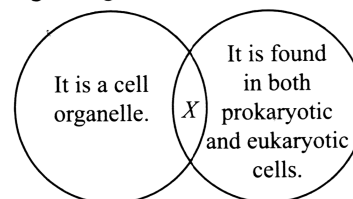
- | I | II | III | IV |
|------|----|-----|----|
| A. T | F | T | F |
| B. T | F | F | T |
| C. F | T | F | F |
| D. F | T | F | T |

64. Refer to the given figure and select the correct statement regarding *P*, *Q*, *R* and *S*.



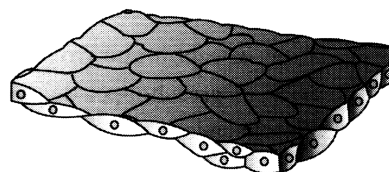
- A. Each *P* gives rise to two motile male gametes that are formed inside the *Q*.
B. *R* refers to stigma that helps to connect style with the ovary.
C. *S* bears several ovules and develops into fruit after fertilisation.
D. None of these

65. Refer to the given Venn diagram and select the correct statement regarding *X*.



- A. *X* could be a membraneless organelle that helps in protein synthesis.
B. *X* could be a membrane bound structure that facilitates transport of materials from one part of the cell to another.
C. *X* could be a membrane bound structure that helps to modify, sort and package materials coming from endoplasmic reticulum.
D. *X* could be a membrane bound structure that helps in production of ATP.

66. Refer to the given figure of a type of epithelial tissue.



This type of epithelium lines

- A. Blood vessels
B. Alveoli of lungs
C. Fallopian tubes
D. Both A and B

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

Statement 1 : Main chemicals responsible for the destruction of ozone layer are chlorofluorocarbons.

Statement 2 : Chlorine and nitrous oxide also cause destruction of ozone layer.

- A. Statement 1 is false but statement 2 is true.
 B. Both statements 1 and 2 are true.
 C. Statement 1 is true but statement 2 is false.
 D. Both statements 1 and 2 are false.
68. Which among the following is a deficiency disease in humans?
- A. Filariasis
 B. Pellagra
 C. Conjunctivitis
 D. Sleeping sickness

69. In a plant, smooth seeds(S) are dominant over wrinkled seeds (s) and green seeds (G) are dominant over yellow seeds (g). A plant homozygous for smooth and green seeds is crossed with a plant having wrinkled and yellow seeds. The F_1 offsprings are self crossed to produce F_2 generation. If a total of 160 offsprings are produced, how many plants are expected to be having wrinkled and green seeds in F_2 generation, according to a typical Mendelian cross?

- A. 90 B. 30
 C. 20 D. 10

70. Select the mismatched pair.

- A. Montreal Protocol – 1987
 B. Ganga Action Plan – 1986
 C. Chipko Movement – 1973
 D. Kyoto Protocol – 1982

Direction (Q. 71 and 72) : Read the given passage and answer the questions that follow

A functional group can be defined as an atom or a group of atoms present in molecule which largely decides its physical and chemical nature. Few organic compounds that consists of functional groups are listed below :

- | | |
|--------------------|--------------------|
| (i) Ethanol | (ii) Ethanoic acid |
| (iii) Bromopropane | (iv) Propanol |
| (v) Propanal | (vi) Propanone |
| (vii) Butanone | |

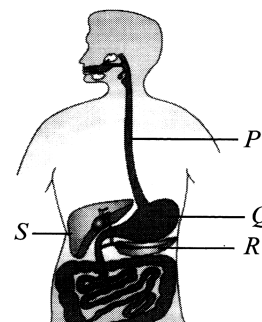
71. Which of the following statements regarding the given compounds is/are correct?

- I. Compounds (i) and (v) contain the same functional group.
 II. Compounds (vi) and (vii) represent the same homologous series.
 III. Compound (iii) consists of multiple (double/triple) bonds.
 IV. Compound (ii) reacts with ethanol in the presence of an acid catalyst to produce an ester.
- A. I and IV only
 B. II only
 C. II and IV only
 D. I and III only

72. Identify the compound that reacts with hot concentrated sulphuric acid to produce ethene.

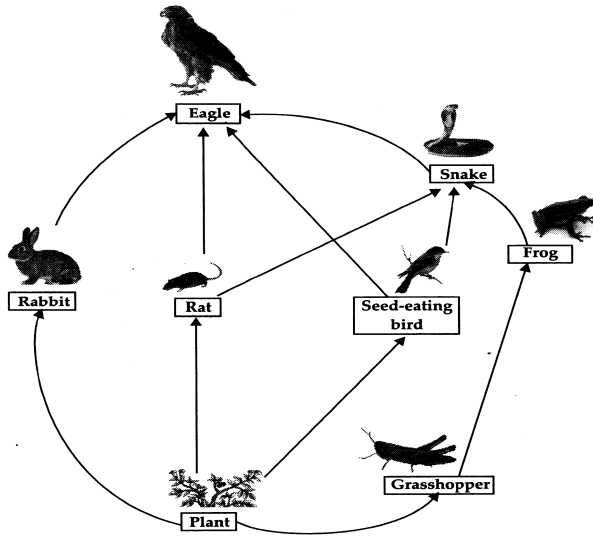
- A. Propanal
 B. Propanol
 C. Ethanoic acid
 D. Ethanol

73. Refer to the given figure and select the incorrect statement regarding P, Q, R and S.



- A. P exhibits peristaltic movement to push partially digested food towards stomach.
 B. Digestion of only fats takes place in Q.
 C. Digestive juice secreted by R contains enzymes like trypsin, amylase and lipase.
 D. Digestive juice produced by S gets stored in gall bladder and helps in digestion of fats.

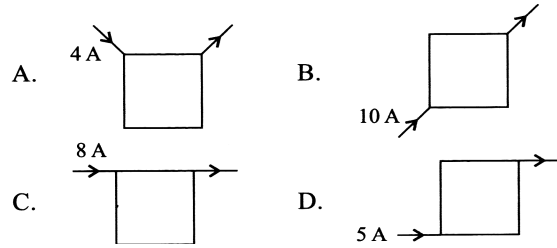
74. Refer to the given food web.



What will be the effect on food web if population of rat and seed-eating bird declines?

- A. Population of rabbit and frog decreases.
- B. Population of grasshopper decreases but that of eagle increases.
- C. Population of rabbit and snake remain unaffected.
- D. None of these

75. Current of different magnitudes flows through uniform square frames as shown in the options. In which case is the magnetic field at the centre of the frame not zero?



Space for rough work

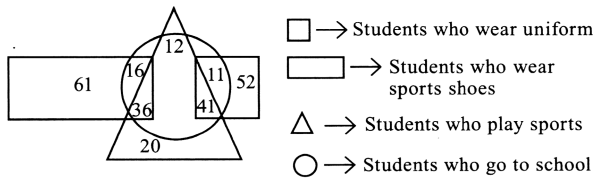
SECTION - C : Logical Reasoning

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. Riding a bike, Ashish travels 5 km towards South, then he turns left and travels 15 km. Again he turns left and travels 15 km. Finally, he turns right and travels 5 km to reach his destination. How far and in which direction is he from the starting point?

- A. $10\sqrt{5}$ km, North-East
- B. $5\sqrt{10}$ km, South-West
- C. $10\sqrt{5}$ km, South-West
- D. $5\sqrt{10}$ km, North-East

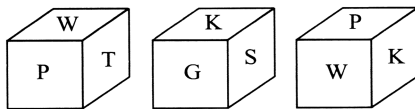
77. Study the given Venn diagram carefully and answer the following question.



Which number represents students who go to school and play sports wearing uniform but not sports shoes?

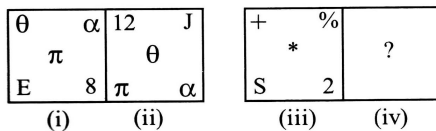
- A. 36
- B. 41
- C. 11
- D. 12

78. Three positions of a cube are given below. Which alphabet will be at the top, if alphabet G is at the bottom?



- A. T
- B. W
- C. K
- D. P

79. There is a certain 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 figure (iv).

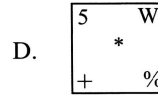
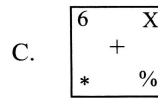


- A.

6	+
X	%
- B.

*	%
6	W

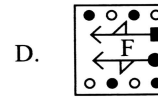
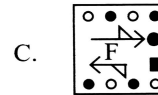
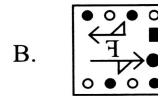
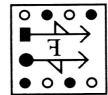
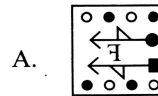
W %
W



80. If in a certain code language, CUSTOMER is written as DWVXPOHV, then how will PREVIOUS be written in that code language?

- A. QTIZJPXW
- B. OTHZKPXW
- C. QTHZJQXW
- D. OTIZJPXW

81. Choose the correct mirror image of the given figure, if the mirror is placed vertically to the right.



82. If 'M' stands for '+', 'N' stands for '×', 'P' stands for '÷' and 'S' stands for '-', then which of the following options become correct?

- A. $18 N 40 P 8 S 6 M 4 = 64$
- B. $18 M 40 S 8 P 6 N 4 = 55$
- C. $18 S 40 N 8 P 6 M 4 = 91$
- D. $18 M 40 P 8 N 6 S 4 = 44$

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

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

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

'A × B' means A is brother of B.

'A ÷ B' means A is daughter of B.

How is P related to M in the expression $M ÷ L - N + P × Q$?

- A. Father
- B. Maternal uncle
- C. Son
- D. Grandfather

84. How many such alphabets are there in the given arrangement each of which is immediately preceded by an even number and immediately followed by a consonant?

T P 4 K 4 7 6 L C 5 8 A J L 5 T S 3 E Z 2 Y R T

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

85. Select a figure from the options which is exactly embedded in the given figure as one of its parts.

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



86. There is a set of three figures X, Y and Z showing a sequence of folding a piece of paper. Figure (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.

87. Find the missing number, if same rule is followed in all the three figures.

81

28	13	7
	9	

56

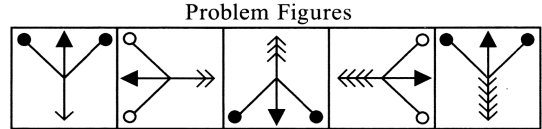
63	28	3
	8	

48

55	?	5
	4	

- A. 21
- B. 25
- C. 23
- D. 27

88. Select a figure from the options which will continue the same series as established by the Problem Figures.



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

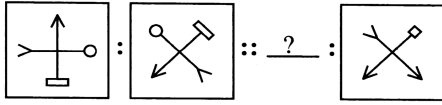
89. Select a figure from the options which satisfies the same conditions of placement of the dots as in the given figure.

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

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

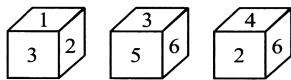
- A. One
- B. Two
- C. Three
- D. More than three

91. There is a certain relationship between the pair of figures on the either side of ::. Identify the relationship of the left pair and find the missing figure.



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

92. Three positions of a dice are given below.



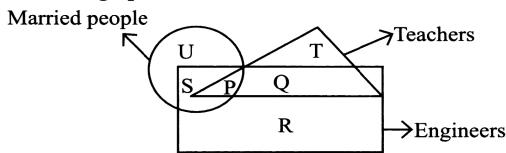
When 5 is at the top, then which number will be at the bottom?

- A. 2
- B. 1
- C. 6
- D. 4

93. In a certain code language, if CARING is coded as EDVGKC, then how will BASKET be coded in the same code language?

- A. DDWMHX
- B. ABTLFU
- C. DDWIBP
- D. ABTLBP

94. Study the given Venn diagram carefully and answer the following question.



Which of the following letters represents married people who are engineers but not teachers?

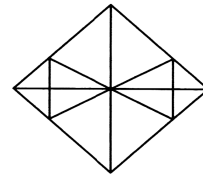
- A. P
- B. S
- C. Q
- D. T

95. Find the missing number, if a certain rule is followed either row-wise or column-wise.

10	8	6
13	12	5
25	?	7

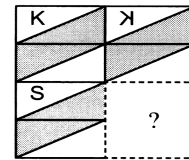
- A. 32
- B. 20
- C. 24
- D. 30

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



- A. 25
- B. 20
- C. 22
- D. More than 25

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



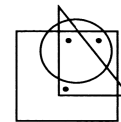
- A.
- B.
- C.
- D.

98. In the following equation, two signs need to be interchanged to make it correct. Choose the signs from the given options.

$$8 \times 7 - 15 \div 5 + 3 = 6$$

- A. - and ×
- B. + and -
- C. × and +
- D. ÷ and ×

99. 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.

100. In the given question, two rows of numbers are given. The resultant number in each row is to be worked out separately based on the given rules and the question below the rows of numbers is to be answered. The operations on numbers progress from left to right.

Rules:

- (i) If an odd number is followed by an even number, then they are to be added.
- (ii) If an even number is followed by an odd number, then they are to be multiplied.

- (iii) If an even number is followed by a number which is a perfect square, then the second number is to be divided by the first number.
- (iv) If an odd number is followed by an odd number, then the second number is to be subtracted from the first number.

7 14 13

8 144 3

Find the difference of the resultant of both the rows.

- A. 45
- B. 46
- C. 64
- D. 54

Space for rough work

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ANSHUMAN

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SHREYANSH JAISWAL

Score: 670 / 720
KGMU, Lucknow



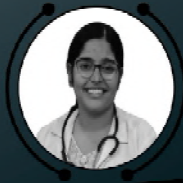
SAWAI SUTHAR

Score: 651 / 720
Rabindranath Tagore
Medical College, Udaipur



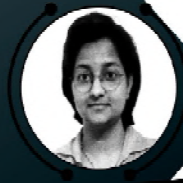
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Score: 640 / 720
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