PART I : PHYSICS

*This section contains **10 Single Choice Questions (Q : 01 to Q : 10).** Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.*

1. Why do ventilators in rooms help cool the room during summer?

(A) Allow radiation

(B) Let hot air escape

(C) Conduct heat away

(D) Absorb solar energy

2. Which of the following is NOT a component of a simple electric circuit?

(A) Bulb

(B) Switch

(C) Battery

(D) Electrolyte

3. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Vacuum	**1.** Can occur in vacuum
Q. Conduction	**2.** Solids
R. Convection	**3.** Liquids & gases
S. Radiation	**4.** Prevents conduction & convection

Code :

	P	*Q*	*R*	*S*
(A)	1	2	3	4
(B)	4	2	3	1
(C)	3	1	4	2
(D)	2	1	4	3

4. An iron nail wrapped with wire is connected to a battery. It attracts pins when current flows. When disconnected, magnetism vanishes. What is the device formed here?

(A) Bar magnet

(B) Horseshoe magnet

(C) Electromagnet

(D) Inductor

5. A cyclist moves with a speed of 7.5 m/s. What distance will be covered in 8 minutes?

(A) 3600 m

(B) 4500 m

(C) 6000 m

(D) 7200 m

Space for rough work

6. **Assertion (A) :** Radiation is the fastest mode of heat transfer.

Reason (R) : Radiation travels with speed of light as electromagnetic waves.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

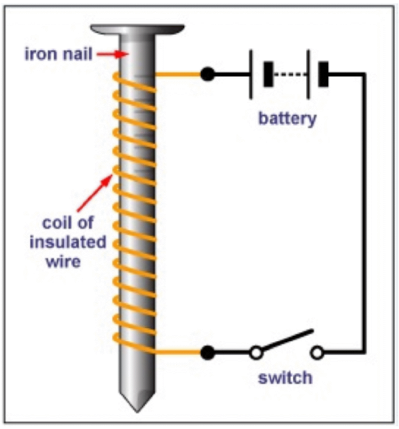
(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Paragraph for Questions 07 & 08

Rohit built a simple electromagnet using a battery, insulated copper wire, and an iron nail.

When the switch was turned on, the iron nail started attracting small iron pins. He noticed that as soon as he turned off the switch, the nail lost its magnetic property. He tried increasing the number of wire turns and found the magnetic strength improved.



7. What caused the nail to act as a magnet?

(A) The wire itself is magnetic

(B) The battery attracted the pins

(C) Current through the coiled wire induced magnetism in the nail

(D) The iron nail was permanently magnetised

8. Why did increasing the number of turns of the wire around the nail enhance the magnetic effect?

(A) Longer wire length reduces resistance

(B) More turns concentrate the magnetic field lines

(C) Nail becomes heavier and more magnetic

(D) Battery provides higher voltage automatically

Space for rough work

9. **Assertion (A) :** A fuse melts when excessive current flows through it.
Reason (R) : A fuse is made of high melting point material.
(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).
(C) Assertion (A) is true and Reason (R) is false.
(D) Assertion (A) is false and Reason (R) is true.

Sequence Based

10. Arrange the sequence of events that take place when an electric bell rings:
P. Strip returns to original position, restarting cycle.
Q. Iron strip is pulled, hammer strikes bell.
R. Current flows through electromag net
S. Contact breaks, current stops.
Which list shows the steps in the correct order?
(A) P, R, Q, S
(B) P, R, S, Q
(C) R, Q, S, P
(D) P, Q, S, R

Space for rough work

PART II : CHEMISTRY

*This section contains **10 Single Choice Questions (Q : 11 to Q : 20)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.*

11. What does the following picture confirm?

(A) Change in temperature of the iron nail

(B) Appearance of reddish-brown layer and weight gain due to corrosion

(C) Loss of shine due to dust

(D) Appearance of blue layer due to rust on iron nail

12. Which of the following is/are correctly matched?

S.No.	Substance	pH Value	Nature
I	Water	7	Neutral
II	Human blood	4.4	Acidic
III	Lime juice	2 to 2.5	Basic
IV	Baking Soda	8 to 9	Basic

(A) II and III

(B) I and II

(C) III and IV

(D) I and IV

13. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Tartaric acid	**1.** Tamarind
Q. Citric acid	**2.** Orange
R. Milk of magnesia	**3.** Soap
S. Caustic soda	**4.** Antacid

Code :

	P	*Q*	*R*	*S*
(A)	1	2	4	3
(B)	4	3	2	1
(C)	3	1	4	2
(D)	2	1	4	3

14. Which of the following reactions is a correct example of salt formation from acid + metal carbonate ?

(A) $NaOH + HCl \rightarrow NaCl + H_2O$

(B) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

(C) $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2$

(D) $CuO + 2HCl \rightarrow CuCl_2 + H_2O$

Space for rough work

15. Which of the following is an example of a physical change in the human body?

(A) Digestion

(B) Photosynthesis

(C) Breaking a bone

(D) Respiration

16. **Assertion (A) :** Calamine can be used to treat an red ant bite.

Reason (R) : Red ant sting is alkaline, and acids can neutralise bases.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Paragraph for Questions 17 & 18

A student takes a small amount of acid in one beaker and base in another. He tests both with red and blue litmus papers and records the colour change. Now, he adds the base to the acid drop by drop using a dropper and stir gently and tests with litmus after each drop. He stops when the solution shows no colour change on litmus paper. He also checks the temperature before and after the reaction.

17. What is the evidence that a chemical change occurred during the activity?

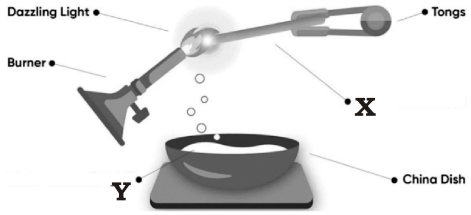
(A) Change in temperature

(B) Litmus paper shows neutral colour

(C) Formation of salt and water

(D) All of the above

18. Identify **X, Y** and the type of reaction.



(A) X = Mg; Y = MgO; Decomposition

(B) X = Mg; Y = MgO; Endothermic

(C) X = Mg; Y = MgO; Combination

(D) X = Mg; Y = MgO_2; Exothermic

19. **Assertion (A) :** All Physical changes are stable.

Reason (R) : Physical changes can be both reversible and irreversible.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Space for rough work

Sequence Based

20. Arrange the following processes in proper sequence to identify acidic and basic substances using turmeric.

I. Take turmeric powder in a china dish.

II. Apply on a blotting paper and dry.

III. Dip strip in solutions.

IV. Make paste with water.

V. Cut the dried papers into thin strips.

VI. Note down the colour.

(A) I → V → II → IV → III → VI

(B) I → IV → III → V → II → VI

(C) I → IV → V → II → III → VI

(D) I → IV → II → V → III → VI

Space for rough work

PART III : BIOLOGY

*This section contains **10 Single Choice Questions (Q : 21 to Q : 30)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.*

21. P has fine hair-like structures called cilia, all over its body that help it to obtain food. P could be :

(A) Amoeba

(B) Paramecium

(C) Hydra

(D) Yeast

22. Read the following statements.

(i) _____tissue is involved in transportation of water and minerals in plants.

(ii) Transpiration produces a_____ pull in the plant that causes the water to move upwards.

(iii) Translocation takes place through the cells of_____.

(iv) _____are known as soldiers of the body.

Select the option that correctly fills up the blanks in any two of the statements.

(A) (i)-Xylem; (iii)-Phloem

(B) (ii)-Suction; (iv)-Platelets

(C) (i)-Phloem; (iv)-Leucocytes

(D) (iii)-Xylem; (iv)-Plasma

23. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Earthworm	**1.** Pulmonary respiration
Q. Human	**2.** Branchial respiration
R. Prawn	**3.** Tracheal respiration
S. Insect	**4.** Cutaneous respiration

Code :

	P	*Q*	*R*	*S*
(A)	1	2	3	4
(B)	4	1	2	3
(C)	3	1	4	2
(D)	2	1	4	3

24. Which of the following parts is not responsible for gaseous exchange?

(A) Stomata

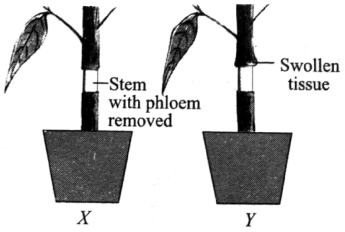
(B) Root surface

(C) Xylem

(D) Lenticels

Space for rough work

25. The given figure shows a setup at the start of an experiment (X) and after a few days (Y). The change observed in setup Y is due to :



(A) Upward movement of food getting blocked.

(B) Downward movement of food getting blocked.

(C) Upward movement of water getting blocked.

(D) Downward movement of water getting blocked.

26. **Assertion (A) :** Aerobic respiration in multicellular organisms involves the exchange of respiratory gases twice.
Reason (R) : Exchange occurs from lung to heart and then heart to lung.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

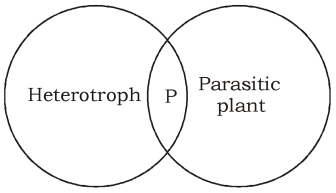
(D) Assertion (A) is false and Reason (R) is true.

Paragraph for Questions 27 & 28

Plants have different nutrition modes. Some make their own food, while others depend on other organisms. Parasitic plants take nutrients from host plants.

The **Venn diagram** shows the overlap between heterotrophic and parasitic plants.

27. Identify the plant labelled "**P**" that belongs to both groups.



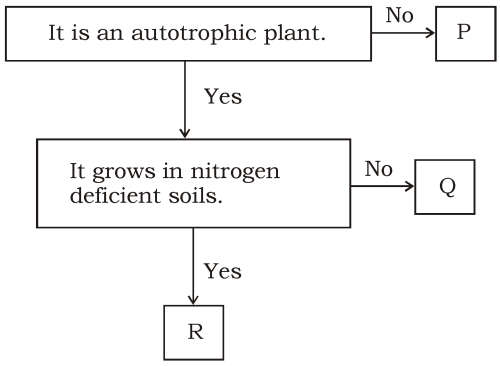
(A) Sundew

(B) Nepenthes

(C) Cuscuta

(D) Rose

28. Study the given flow chart carefully and select the option that correctly identifies P, Q and R.



Space for rough work

(A) R could be any parasitic leafless plant such as mistletoe which depends on the host plant for water and minerals.

(B) R could be a Venus fly trap which has special leaf modification to catch and digest insects.

(C) Q could be Cuscuta which is a rootless photosynthetic plant.

(D) All of these

29. **Assertion (A) :** Respiration occurs faster in actively growing plant tissues.

Reason (R) : Actively growing tissues have a high demand for energy and biosynthesis

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Sequence Based

30. Which enzymes are likely to act on the baked potatoes eaten by a man, starting from the mouth as they move down the alimentary canal?

(A) Salivary amylase → Pancreatic amylase → Disaccharidases

(B) Pancreatic amylase → Salivary amylase → Lipase

(C) Salivary maltase → Lipase → Trypsinogen

(D) Salivary maltase → Pancreatic amylase → Trypsin

Space for rough work

PART IV : MATHEMATICS

*This section contains **20 Single Choice Questions (Q : 31 to Q : 50)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.*

31. In triangle xyz, if $\angle x = 70°$ and $\angle y = 50°$, what is the measure of the exterior angle at vertex z ?

(A) 60°

(B) 120°

(C) 130°

(D) 140°

Sequence Based

32. Consider steps to construct a triangle given two sides and the included angle (SAS Criterion).

P. From A, Draw a line segment AC such that AC = b.

Q. Draw a line segment AB of length c.

R. At point A, construct an angle equal to the given angle A.

S. Join B and C to form the triangle ABC.

Which list shows the steps in the correct order?

(A) Q, P, R, S

(B) P, R, Q, S

(C) R, P, Q, S

(D) P, Q, S, R

33. Which of the following option is correctly arranges in ascending order.

(A) $-\frac{1}{2}, 0.05, \frac{1}{4}, 0.3$

(B) $0.05, -\frac{1}{2}, 0.3, \frac{1}{4}$

(C) $\frac{1}{4}, 0.3, -\frac{1}{2}, 0.05$

(D) $0.05, -\frac{1}{2}, \frac{1}{4}, 0.3$

34. **Assertion (A) :** In algebraic expression $2y^2 + 3yz - y^2 - yz + z^2 - xyz$; $2y^2$, $3yz$, y^2, yz, z^2 and xyz are terms of expression.

Reason (R) : Expression are made of up terms. Terms are added to make an expression.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

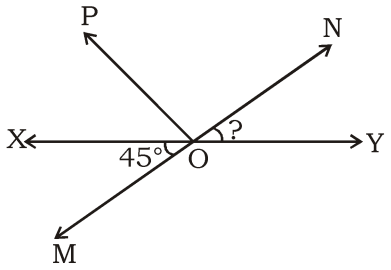
(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Space for rough work

35. In the given figure, line XY and MN intersect at O. If ∠XOP + ∠YON = 85° and ∠XOM = 45°, ∠YON is :



(A) 55°
(B) 45°
(C) 75°
(D) 65°

36. Which of the following statement/s is/ are **True(T)** or **False(F)** ?

(i) The sum of any two sides of a triangle is greater than the third side.

(ii) A triangle can have all its angle acute.

(iii) A right angled triangle cannot be equilateral.

(iv) Difference of any two sides of a triangle is greater than the third side.

Code :

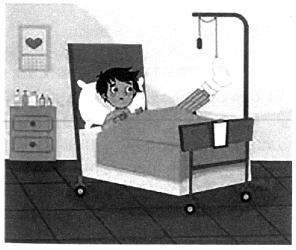
	(i)	*(ii)*	*(iii)*	*(iv)*
(A)	T	T	T	F
(B)	T	F	T	T
(C)	T	T	F	T
(D)	F	T	T	F

37. The quotient when 0.00639 is divided by 0.213 is :

(A) 0.3
(B) $0.\overline{03}$
(C) 0.003
(D) 0.03

Paragraph for Questions 38 & 39

Mani's childhood friend was suffering from serious injury on knees from a long time. So, mani went to his hometown Amritsar to see his friend, which is 325 km away from his own place, Mani covered $\left(\frac{1}{5}\right)^{th}$ of his journey by bus, 227.5 km by train, 16.25 km by taxi and rest by walking.



38. How much distance did he cover by bus ?

(A) 70 km
(B) 75 km
(C) 65 km
(D) 100 km

39. Difference between the distance covered by train and by bus is :

(A) 65 km
(B) 70 km
(C) 162.5 km
(D) 225.7 km

Space for rough work

40. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Match each equation in column-I with its correct solution for 'x' in column-II.

Column – I	**Column – II**
P. $7(x-3) - 2x = 3x - 1$	**1.** $x = \frac{14}{3}$
Q. $5 - (2x + 3) = 4x - 10$	**2.** $x = 10$
R. $\frac{x}{2} - \frac{1}{3} = \frac{x}{4} + \frac{5}{6}$	**3.** $x = 2$
S. $2.5(x-4) + 0.5 = 8$	**4.** $x = 7$

Code :

	P	***Q***	***R***	***S***
(A)	1	2	3	4
(B)	2	3	1	4
(C)	3	1	4	2
(D)	2	1	4	3

41. If the ratio of two co-interior angles on the same side of the transversal is 7 : 8, the bigger angle of the two angles is :

(A) 54°

(B) 100°

(C) 96°

(D) 84°

Sequence Based

42. Set of decimal number : 2.05, 2.5, 2.005, 2.505. Arrange the following steps to order these decimals from smaller to largest.

P. Compare the digits in tenths place, if they are the same, move to the hundredths place and so on.

Q. Write down all the given decimal numbers.

R. Add trailing zeroes to ensure all numbers have the same number of decimals places for eaiser comparison.

S. Arrange the decimals based on the comparison, from smallest to largest.

Which list shows the steps in the correct order?

(A) S, P, Q, R

(B) Q, R, P, S

(C) R, P, Q, S

(D) P, Q, S, R

43. Simplify : $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$

(A) $\sqrt{2}$

(B) 2

(C) 4

(D) 8

Space for rough work

44. **Assertion (A) :** The supplement of $\frac{1}{2}$ of 120° is 60°.

Reason (R) : If two angles are supplement then their sum is 180°.

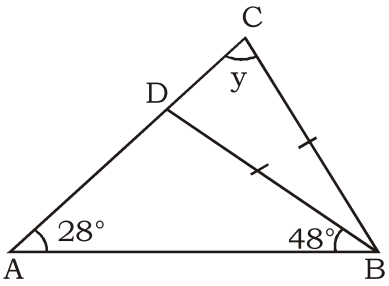
(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

45. In the given figure, ABC is a triangle and BC = BD. Find the value of y.



(A) 73°

(B) 74°

(C) 75°

(D) 76°

46. Which of the following statement/s is/ are **True(T)** or **False(F)** ?

(i) The product of two monomials, $(-3x^2y)$ and $\frac{2}{9}xy^3$ is a trinomial with a coefficient of $-\frac{2}{3}$.

(ii) If we subtract $(5a^2 - 7ab + 3b^2)$ from $(3b^2 - 2ab + 4a^2)$, the result is $-a^2 + 5ab$.

(iii) The identity $(a - b)^2 = a^2 - b^2$ is true for all real value of 'a' and 'b'.

(iv) When $(2x - 3)$ is multiplied by $4x^2 + 6x + 9$, the product is equivalent to $(8x^3 - 27)$

Code :

	(i)	*(ii)*	*(iii)*	*(iv)*
(A)	T	F	T	F
(B)	T	F	T	T
(C)	T	T	F	T
(D)	F	T	F	T

47. Simplify :

$$\left[\left(\frac{5}{4}-1.25\right)\div\left(\frac{1}{2}+0.5\right)+\left(-\frac{3}{7}\times\frac{14}{9}\right)-\left(2.1-\frac{1}{5}\right)\right]$$

(A) $-\frac{77}{30}$

(B) $\frac{30}{77}$

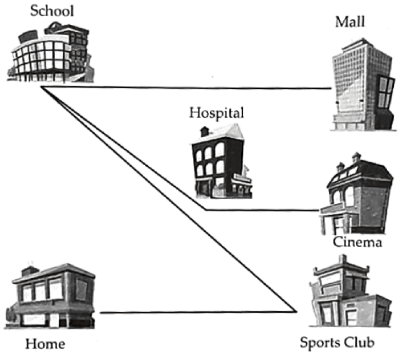
(C) $-\frac{30}{77}$

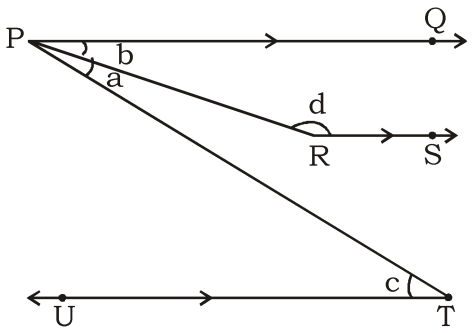
(D) $\frac{77}{30}$

Space for rough work

Paragraph for Questions 48 & 49

A surveyor represented the roads connecting various land marks near by his home in the locality as shown below:





48. If $\angle b$ is $\frac{5}{4}$ times $\angle c$ and they are supplements of each other, then $\angle c$ is :

(A) 50°

(B) 130°

(C) 80°

(D) 65°

49. If $\angle c = 60°$, then which of the following is correct ?

(A) $\angle d + 2\angle a = 210°$

(B) $3\angle d - \angle a = 150°$

(C) $\angle d - \angle a = 120°$

(D) $\angle d - \angle c = 60°$

50. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I		Column – II	
P.	Two angle whose sum is 90°.	**1.**	Supplementary angle
Q.	Angles formed by two intersecting lines that are directly opposite to each other.	**2.**	Linear pair of angles
R.	A pair of adjacent angle whose non-common arms form a straight line.	**3.**	Complementary angle
S.	Two angles whose sum is 180°.	**4.**	Vertically opposite angle

Code :

	P	***Q***	***R***	***S***
(A)	1	2	3	4
(B)	4	3	2	1
(C)	3	4	2	1
(D)	2	1	4	3

Space for rough work

PART V : LOGICAL REASONING & IQ

This section contains ***10 Single Choice Questions (Q : 51 to Q : 60)****. Each question has four choices* ***(A), (B), (C) and (D)*** *out of which* ***ONLY ONE*** *is correct.*

Direction (51-52) : In given number series, find the next term :

51. 6, 13, 28, 59, ?

(A) 111

(B) 113

(C) 122

(D) 126

52. 8, 64, 216, 512, 1000, 1728, ?

(A) 4096

(B) 2744

(C) 3375

(D) 2137

53. A man is facing towards the East. He then turns 45° anti-clockwise, again 180° anti-clockwise and then 225° clockwise. In which direction is he facing now ?

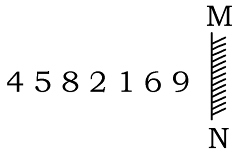
(A) West

(B) North

(C) South

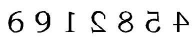
(D) East

54. In this question, choose the correct mirror - image from alternatives (MN is mirror) :



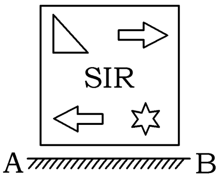
(A) 

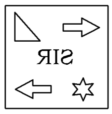
(B) 

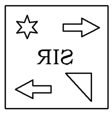
(C) 

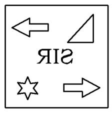
(D) 

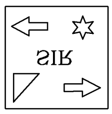
55. In this question, choose the correct water - image from alternatives :



(A) 

(B) 

(C) 

(D) 

Space for rough work

56. In a class, the rank of Vikas is 13th from the top and 16th from the bottom. The total number of students in the class are –

(A) 27

(B) 28

(C) 29

(D) 30

57. Select the correct combination of mathematical signs that can sequentially replace the (*) signs and balance the given equation :

75 * 85 * 17 * 12 * 6 * 8

(A) ×, –, ÷, +, =

(B) +, ÷, –, ×, =

(C) ×, ÷, –, +, =

(D) +, ×, ÷, –, =

58. Which two signs should be interchanged to make the given equation correct ?

225 + 5 × 3 ÷ 5 – 7 = 133

(A) – and ÷

(B) + and ×

(C) + and ÷

(D) – and ×

59. In a row of 21 girls and all are facing towards North. When Monika was shifted by four places towards the right, she became 12th from the left end. What was her earlier position form the right end of the row ?

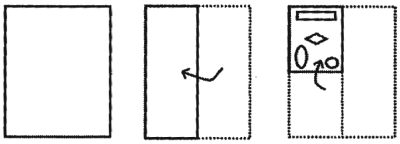
(A) 8th

(B) 10th

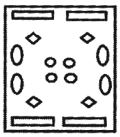
(C) 12th

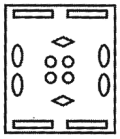
(D) 14th

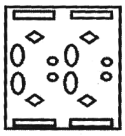
60. Find the completely unfolded figure of Z.

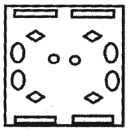


X Y Z

(A) 

(B) 

(C) 

(D) 

Space for rough work