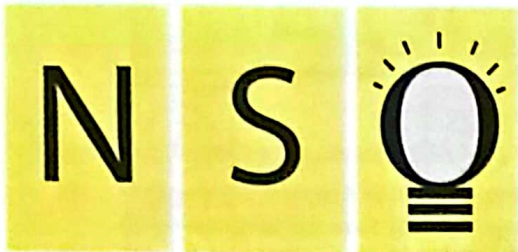




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OLYMPIAD 2024-25**

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CLASS **7**

SET-B

Total Questions : 50 | Time : 1 hr.

Guidelines for the Candidate

1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Section, Roll No.** and **Mobile Number** clearly on the **OMR Sheet** and do not forget to sign it. We will share your marks / result and other information related to SOF exams on your mobile number.
3. The Question Paper comprises three sections:
Logical Reasoning (10 Questions), **Science** (35 Questions) and **Achievers Section** (5 Questions)
Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.
4. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
5. There is only ONE correct answer. Choose only ONE option for an answer.
6. To mark your choice of answers by darkening the circles on the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only. E.g.
Q.16: If a mixture can be separated by magnetic separation, one of the constituents must be
A. Ferrous B. Non-ferrous C. Precious D. Non-metallic.
As the correct answer is option A, you must darken the circle corresponding to option A on the OMR Sheet.
7. Rough work should be done in the blank space provided in the booklet.
8. Return the OMR Sheet to the invigilator at the end of the exam.
9. Please fill in your personal details in the space provided before attempting the paper.
10. **Participate in SOF-Techfest IIT Bombay Innovation Challenge. Open for class 8, 9 & 10. For details, please visit : www.sofworld.org**

16. ● (B) (C) (D)

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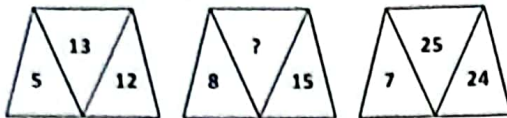
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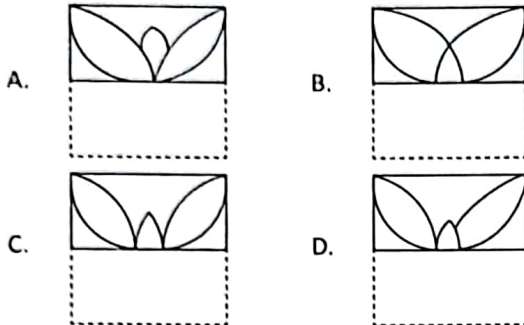
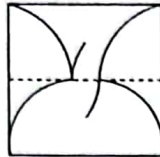
LOGICAL REASONING

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

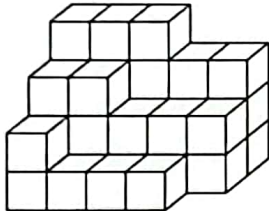


- A. 16
B. 17
C. 18
D. 23

2. A square transparent sheet with a pattern and a dotted line on it is given. Select a figure from the options as to how the pattern would appear when the transparent sheet is folded along the dotted line.



3. Count the number of cubes in the given figure.



- A. 36
B. 35
C. 37
D. 39

4. Which of the following interchanges of signs would make the given equation correct?

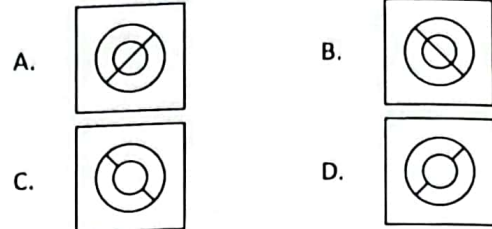
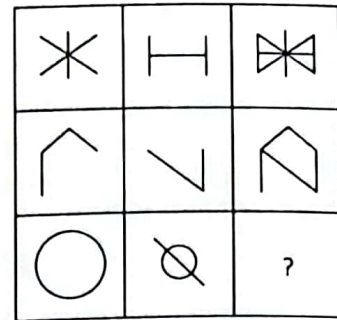
$$8 \times 290 - 200 \div 50 + 70 = 18$$

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

5. If second Thursday of August 20XX falls on third day after 5th August 20XX, then 4th Sunday of the same month will be on _____.

- A. 24th August
B. 18th August
C. 25th August
D. 23rd August

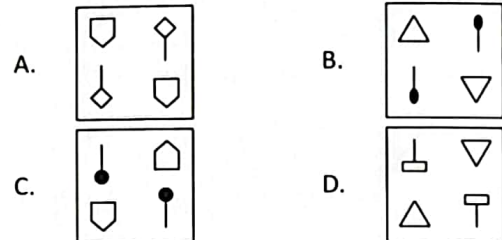
6. Which of the following options will complete the given figure matrix?



7. Arrange the given words in the sequence in which they occur in the dictionary and select the correct option.

1. Marriage
2. Merger
3. Manage
4. Margin
5. Mortal
A. 3, 1, 4, 2, 5
B. 3, 4, 1, 2, 5
C. 3, 1, 4, 5, 2
D. 3, 4, 1, 5, 2

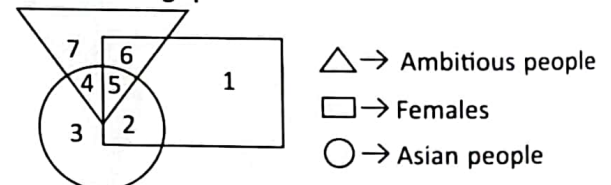
8. Select the odd one out.



9. In a family of six persons, P, Q, R, S, T and U, there are only two married couples. S is the father-in-law of R, who has only one child U. P is the uncle of Q. T is the sister-in-law of P, who is unmarried. How is Q related to R?

- A. Brother
B. Husband
C. Brother-in-law
D. Can't be determined

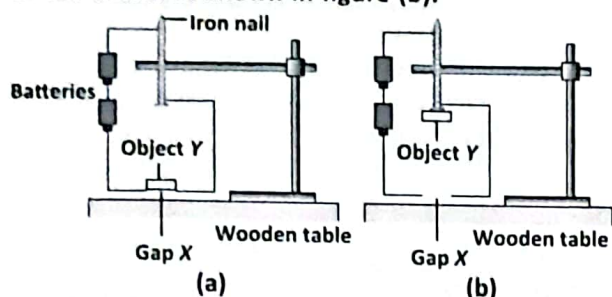
10. Study the given Venn diagram carefully and answer the following question.



Which of the following numbers represent the Asian males who are ambitious?

- A. 3
B. 7
C. 5
D. 4

11. A student puts an object Y at gap X in a circuit as shown in figure (a), this results in the rearrangement of the circuit as shown in figure (b).



Which of the following observations is/are incorrect?

- In figure (b), iron nail continues to behave as an electromagnet for next few minutes.
 - The observations of figure (a) and figure (b) are satisfied only when object Y is a magnet.
 - The strength of force of attraction of iron nail on object Y is independent of the number of batteries used in the arrangement.
- A. (i) only B. (i) and (iii) only
C. (ii) and (iii) only D. (i), (ii) and (iii)

12. Pari walks up a stationary escalator in 20 s. If she remains stationary, then the escalator takes her up in 30 s. Which one of the following statements is incorrect for the motion of Pari?

- The speed of Pari on stationary escalator is more than the speed of the moving escalator.
- The time taken by Pari to walk up the moving escalator will be less than the time taken by her for walking up the stationary escalator.
- If the distance travelled on the escalator is 60 m, the effective velocity of Pari and moving escalator in the given case will be 5 m/s, if both are moving simultaneously.
- If in the journey of 60 m on moving escalator, escalator stops moving after 30 m, the total time taken by Pari to reach up the top will be less than 10 s.

13. The melting and boiling points of three substances are given in the table. The room temperature is 36°C.

Substance	Melting point	Boiling point
X	20°C	140°C
Y	36°C	200°C
Z	40°C	250°C

Select the correct statement(s).

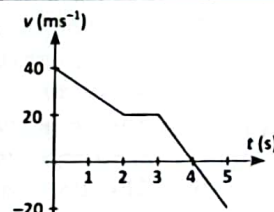
- Substance X will be in liquid state at room temperature.
- The solid and liquid state of substance Y coexists at room temperature.
- Substance Z will be in solid state at room temperature.
- Substance X undergoes vaporisation at the temperature of 140°C.

- (ii) only
- (i), (iii) and (iv)
- (i) and (iii)
- (i), (ii), (iii) and (iv)

14. Which one of the following statements is incorrect?

- Magnet may lose its magnetic property when heated to a very high temperature.
- Magnetic force is a pulling force only.
- To increase the magnetic strength, number of strokes while creating a magnet should be increased.
- Repulsion is the surest test of magnetism.

15. Consider the velocity (v)-time (t) graph of a body as depicted in the given figure. Match column I with column II and select the correct option from the given codes.



	Column I	Column II
(a)	Distance travelled by the body in 5 s	(i) 60 m
(b)	Displacement of body during time interval $t = 2$ s to $t = 3$ s	(ii) 0
(c)	Displacement of the body in 2 s	(iii) 20 m
(d)	Displacement of the body during time interval $t = 3$ s to $t = 5$ s	(iv) 100 m

- (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
- (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
- (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
- (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

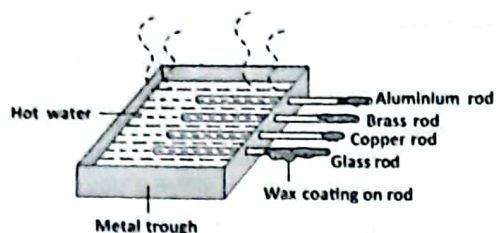
16. An object approaches a convergent lens from the left with a uniform speed of 5 m s⁻¹ and stops at the focus. The image

- Moves away from the lens with a uniform speed 5 m s⁻¹
- Moves away from the lens with a uniform acceleration
- Moves away from the lens with a non-uniform acceleration
- Moves towards the lens with a non-uniform acceleration.

17. Ananya's and Tanya's homes are at 0.8 km and 0.6 km respectively from their common school in opposite directions. Shreya lives further 0.8 km away from Tanya's house. Which one of the following statements is incorrect?

- The distance between Ananya's and Tanya's homes is less than 2 km.
- If Shreya wants to reach Ananya's house, she has to travel a distance of more than 2 km.
- Shreya has to walk twice the distance that Ananya walks to reach the school.
- When, Ananya and Tanya walk from their respective homes towards the school at the same pace, Tanya reaches school first.

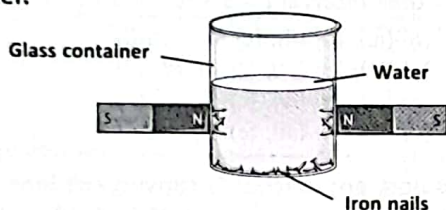
18. Four rods of equal length and thickness but of different materials are coated with wax in the same manner. They are fixed to a trough containing hot water. The given diagram illustrates what happens to the wax on each rod after five minutes.



What can you conclude from the given diagram?

- Aluminium rod can conduct heat better than the brass rod.
 - The aluminium rod conducts heat better than the copper rod.
 - The glass rod conducts heat better than the copper rod.
 - The wax on the copper rod melts faster than the wax on the brass rod.
- A. (i) and (iv) only B. (ii) and (iii) only
C. (i) and (ii) only D. (iii) and (iv) only

19. The experimental setup in the given figure shows some iron nails stuck on the walls and some iron nails at the bottom of the glass container filled with water.



Which of the following statements correctly represent these observations?

- The iron nails are attracted by the magnets.
 - The force of attraction due to magnets cannot pass through the water.
 - There is a magnetic force of attraction passing through the material of the container.
 - The container attracts the iron nails because of its magnetic property.
- A. (i) and (ii) only B. (i) and (iii) only
C. (ii) and (iii) only D. (iii) and (iv) only

20. The refractive indices of three media are shown in the given table.

Medium	Refractive Index
P	1.7
Q	1.8
R	1.4

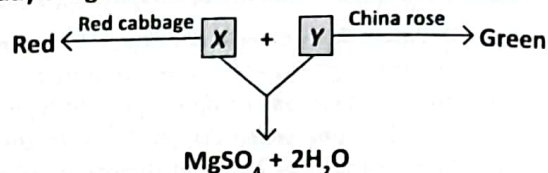
A ray of light is travelling from P to Q and another ray is travelling from Q to R. Read the given statements and select the option that correctly identifies them as true (T) and false (F) ones.

- The ray of light travelling from medium P to medium Q will move towards the normal after refraction.

- The ray of light travelling from medium Q to medium R will move away from the normal after refraction.
- The speed of light ray increases when light ray travels from medium P to medium Q while it decreases when it travels from medium Q to medium R.
- The value of speed of light when it travels from medium P to air will become 1.76×10^8 m/s.

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

21. Study the given flowchart carefully and identify X and Y.



- A. $X = \text{Mg}(\text{OH})_2$, $Y = \text{H}_2\text{SO}_4$
B. $X = \text{H}_2\text{SO}_4$, $Y = \text{Mg}(\text{OH})_2$
C. $X = \text{MgS}$, $Y = \text{H}_2\text{O}$
D. $X = \text{H}_2\text{O}$, $Y = \text{MgS}$

22. Read the following statements carefully and select the option that correctly identifies them as true (T) and false (F) ones.

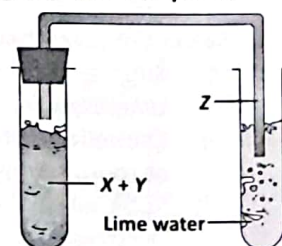
- The forces of attraction between the particles of a solid are very strong due to which they have a definite shape but no definite volume.
- Lemon juice and glycerine are soluble in water while sand and coconut oil are insoluble in water.
- Malleability is a chemical property of metals because of which a given metal can be drawn into long wires.
- Materials like frosted glass and clear glass allow most of the light to pass through them, therefore they are said to be translucent.

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

23. Study the given setup where gas Z is produced by the reaction of X and Y and then gas Z is passed through lime water.

Fill in the blanks by selecting the correct option.

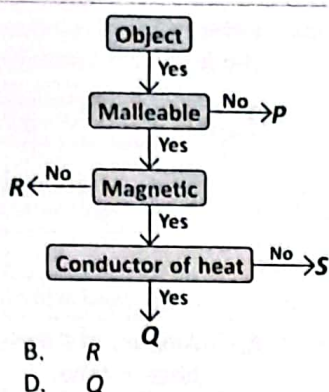
X is _____ and Y is _____. When _____ (Z) is passed through lime water, _____ is formed which makes lime water milky.



- A. Hydrochloric acid, zinc carbonate, hydrogen gas, calcium hydroxide

- B. Vinegar, sodium carbonate, hydrogen gas, calcium carbonate
 C. Acetic acid, baking soda, carbon dioxide, calcium carbonate
 D. Hydrochloric acid, vinegar, carbon dioxide, calcium hydroxide

24. The given flow chart depicts some properties of four objects P, Q, R and S. One of the objects is an iron nail. Identify the iron nail from the given information and select the correct option.



25. A few salts are listed as :

- (i) Epsom salt (ii) Washing soda
 (iii) Baking soda (iv) Blue vitriol
 (v) Potassium nitrate

Identify the hydrated salts from the given list.

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

26. Which of the following mixtures cannot be separated by the respective method of separation given?

- A. Husk and grains – Winnowing
 B. Kidney beans and chickpeas – Sieving
 C. Mustard oil and water – Separating funnel
 D. Tea leaves from tea – Filtration

27. Ridhi, a science teacher, prepared the following three different types of solutions in the laboratory:



Select the incorrect statement(s) from the following.

- (i) The solutions L and M can be distinguished with the help of methyl orange indicator.
 (ii) Red cabbage indicator shows green colour in solution L and red colour in solution N.
 (iii) Phenolphthalein remains colourless in solution M and shows pink colour in solution L.
 (iv) China rose indicator turns magenta in solution L and green in solution M.

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

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

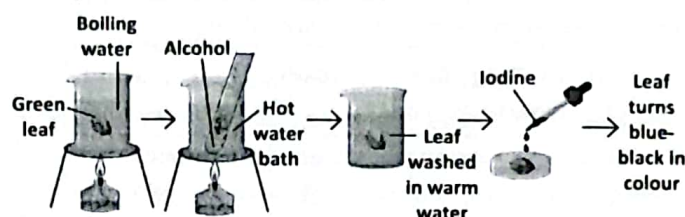
- (i) The reaction between iron and copper sulphate is an example of a double displacement reaction.
 (ii) The reaction between carbon and sulphur is exothermic in nature as heat energy is required for the reaction.

(iii) Dissolution of sugar in water is a physical change while baking of cake is a chemical change.

(iv) Physical changes are usually irreversible and are accompanied by the evolution of a gas.

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

29. The given diagram shows the steps for testing the presence of starch in a leaf.



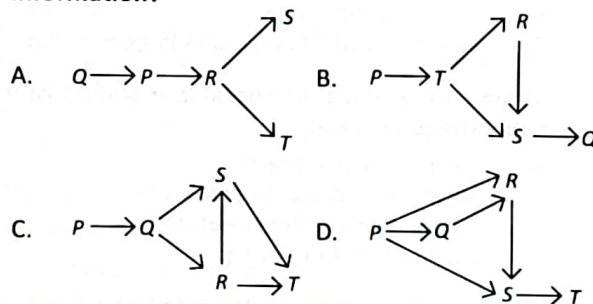
Why is the leaf boiled in alcohol in the above experiment?

- A. To kill the leaf
 B. To destroy the chlorophyll of the leaf
 C. To soften the leaf
 D. To breakdown the cell wall of the leaf

30. Read the given statements regarding the feeding habits of five organisms P, Q, R, S and T of a particular food web.

- (i) Organism Q feeds on organism P.
 (ii) Organism Q is the prey of organisms S and R.
 (iii) Organism P constitutes the first trophic level.
 (iv) Organism R is a prey of organism S.
 (v) Organism T is a tertiary consumer and predator of both R and S.

Which of the following options shows the correct representation of food web based on the given information?



31. Sara took a small amount of jaggery powder in a test tube and added solution X to it. She then heated the test tube and observed that the colour changes to brick red.

Based on the above given information, select the option that correctly answers the questions (i) and (ii).

- (i) What is Sara testing in the sample?
 (ii) What could be the solution X?

- (i) (ii)
 A. Presence of sugar Benedict's solution
 B. Presence of starch Iodine solution
 C. Presence of sugar Copper sulphate solution
 D. Presence of starch Benedict's solution

32. Unscramble the given set of letters to identify a plant and select the correct statement regarding it.

UESDNW

- A. It is fully dependent on host plant for its nutrition.
 B. It obtains water and minerals from its host plant.
 C. It exhibits both autotrophic and heterotrophic mode of nutrition.
 D. It exhibits symbiotic relationship with an algae.

33. Refer to the given list of organisms.

Hydra, Frog, Rohu, Crocodile, Leech, Lizard, Cockroach, Pigeon

How many among them are ammonotelic?

- A. 3 B. 4
 C. 5 D. 6

34. Unscramble the given letters and select the option that correctly identifies the type of response of a plant part towards touch stimulus.

- A. PHSOIGTRTIMOM B. DOIOYHSTRRPM
 C. THPOORTISPMO D. EMROGTSIPO

35. Select the correct match of the reproductive part of a flower and its function.

- A. Style – Supports and supplies nutrients to the anther
 B. Ovary – Receives pollen grains from the stamen
 C. Stamen – Produces pollen grains
 D. Stigma – Develops into a fruit

36. In which of the following parts of the human digestive system do amylases work?

- A. Mouth only
 B. Mouth and small intestine
 C. Small intestine only
 D. Mouth, small intestine and large intestine

37. Select the group that contains modified roots for the storage of food.

- A. Carrot, Banyan, Maize
 B. Sugarcane, Maize, *Dahlia*
 C. Ginger, Radish, Sweet potato
 D. Carrot, Beetroot, Turnip

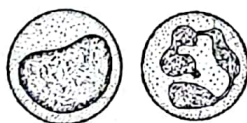
38. Read the given statements regarding a forest layer.

- (i) It is the thickest layer of the forest.
 (ii) In this layer, the branches of trees form a roof over other plants in the forest.
 (iii) This layer prevents most of the sunlight and rainwater from reaching the other layers below it.

Now, select the option that correctly identifies it.

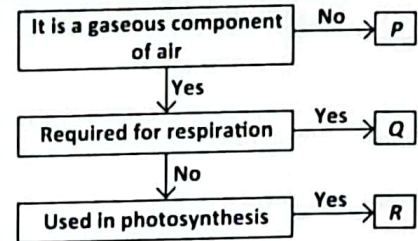
- A. Canopy B. Understorey
 C. Emergent layer D. None of these

39. The cells shown in the given figure are found in the blood. Which of the following statements is/are correct regarding these cells?



- (i) They do not have nucleus.
 (ii) They help the body to fight against infections.
 (iii) They help the blood to clot.
 (iv) They help to transport oxygen in the body.
 A. (ii) only B. (i) and (ii) only
 C. (i), (ii) and (iii) only D. (i), (iii) and (iv) only

40. Refer to the given flow chart. Identify P-R and select the incorrect statement regarding them.



- A. Amount of P varies from place to place and from time to time.
 B. Q supports the burning process.
 C. R is used to extinguish the fire.
 D. None of these

41. Which among the given seeds/fruits are dispersed by animals?

(i) Coconut, (ii) Maple, (iii) Xanthium, (iv) Balsam, (v) Castor, (vi) Urena, (vii) Madar

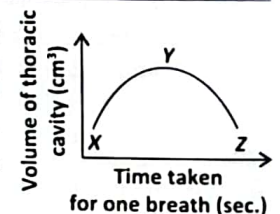
- A. (ii), (iii) and (vii) only B. (iv), (v) and (vi) only
 C. (iii) and (vi) only D. (i), (iii) and (iv) only

42. Refer to the given table and select the correct option regarding P-S.

Mineral / Vitamin	Source	Deficiency disease
P	Green leafy vegetables	Anaemia
Iodine	Q	Goitre
Vitamin A	Carrot	R
S	Chicken breast	Pellagra

- | P | Q | R | S |
|--------------|----------------|-----------------|-------------------------|
| A. Calcium | Salt | Scurvy | Vitamin B ₁₂ |
| B. Iron | Seafood | Night blindness | Vitamin B ₃ |
| C. Potassium | Fish-liver oil | Beriberi | Vitamin C |
| D. Sodium | Seafood | Hyponatremia | Vitamin D |

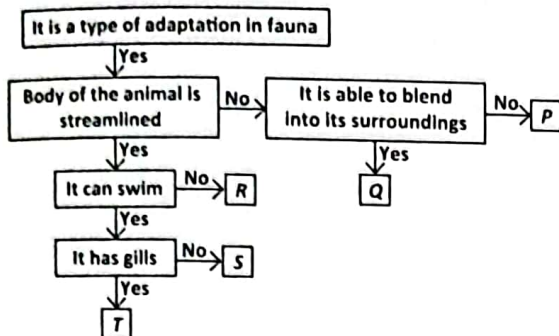
43. The given graph shows changes in the volume of thoracic cavity in a normal human being while breathing. Select the correct option regarding this.



- A. From X to Y, pressure in lungs increases whereas from Y to Z pressure in lungs decreases.
 B. From X to Y, ribs move upward and outward whereas from Y to Z ribs move downward and inward.

- C. At point Y, diaphragm is dome-shaped whereas at points X and Z, it is flat.
D. X to Y represents exhalation and Y to Z represents inhalation.

44. Study the given flow chart carefully and select the option which correctly identifies animals P-T.



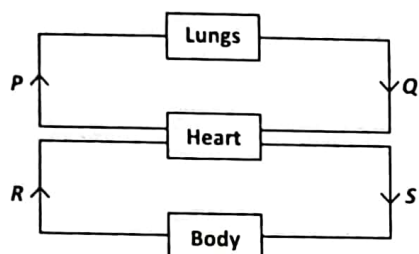
	P	Q	R	S	T
A.	Buffalo	Arctic hare	Eagle	Dolphin	Guppy
B.	Pelican	Grasshopper	Bat	Whale	Seal
C.	Penguin	Crocodile	Camel	Shark	Frog
D.	Hawk	Polar bear	Kangaroo	Crab	Walrus

45. Select the correct statement regarding air pollution.

- A. Burning of fuels like coal and petroleum causes air pollution.
B. Air pollution causes allergies, asthma and even cancer.
C. Chlorine released from the breakdown of CFCs damages the ozone layer.
D. All of these

ACHIEVERS SECTION

46. Refer to the given diagram showing blood circulation in a human body and select incorrect statement(s) regarding it.



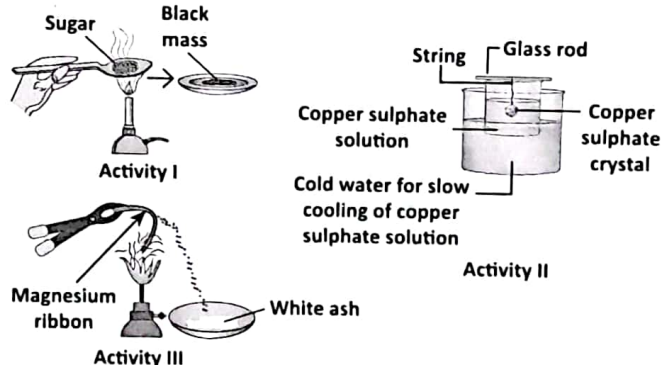
- (i) S carries oxygenated blood whereas R carries deoxygenated blood.
(ii) P could be pulmonary artery which carries deoxygenated blood.
(iii) R could be pulmonary vein which carries oxygenated blood.
(iv) The circulation of blood between heart and lungs through P and Q is called systemic circulation.
- A. (i) and (ii) only B. (iii) and (iv) only
C. (ii) only D. (i), (iii) and (iv) only

47. Match column I with column II and select the correct option from the given codes.

Column I	Column II
P. Incisor	(i) Tearing
Q. Canine	(ii) 12
R. Premolar	(iii) Crushing and grinding
S. Molar	(iv) Chisel shaped
	(v) Flat and ridged with small grooves
	(vi) Flat and wide with ridges
	(vii) Sharp and pointed
	(viii) 8

- A. P-(iv), (viii); Q-(i), (vii); R-(iii), (v), (viii); S-(ii), (iii), (vi)
B. P-(i), (vii), (viii); Q-(iv), (viii); R-(ii), (vi); S-(iii), (v)
C. P-(iii), (vi); Q-(i), (vii); R-(ii), (v), (viii); S-(iv), (viii)
D. P-(ii), (v); Q-(i), (vi), (viii); R-(iv), (vii); S-(iii), (viii)

48. Mr. Malik, a science teacher, demonstrated the following activities in the lab.



Based on these activities, fill in the blanks by selecting the correct option.

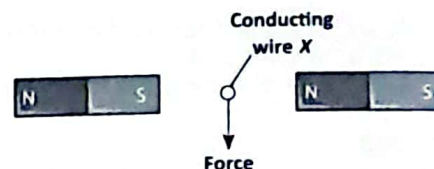
In activity I, the black mass is of (p). Activity II represents a (q) change. Activity III represents a (r) reaction and the white ash produced is of (s) which turns (t) litmus (u) when dissolved in water.

	(p)	(q)	(r)	(s)	(t)	(u)
A.	Charcoal	Physical	Combination	Magnesium oxide	Blue	Red
B.	Coke	Chemical	Decomposition	Magnesium hydroxide	Red	Blue
C.	Coal	Chemical	Displacement	Magnesium hydroxide	Blue	Red
D.	Charcoal	Physical	Combination	Magnesium oxide	Red	Blue

49. Refer to the given dichotomous key and select the incorrect statement regarding *P-T*.

- I. (a) It is an organism which reproduces asexually — Go to II
(b) It is an organism which reproduces sexually — Go to III
 - II. (a) It reproduces through budding — *P*
(b) It reproduces through spore formation — *Q*
 - III. (a) It could undergo autogamy — *R*
(b) It could undergo allogamy — Go to IV
 - IV. (a) It is pollinated by water — *S*
(b) It is pollinated by insects — *T*
- A. *P* could be *Hydra* whereas *Q* could be *Rhizopus*.
 - B. *R* could be rice whereas *T* could be *Bougainvillea*.
 - C. *S* could be *Zostera* whereas *T* could be *Mimosa*.
 - D. *Q* could be *Acacia* whereas *S* could be papaya.

50. A current carrying conducting wire *X* experiences a downward force when placed between two magnets as shown in the given figure.



Now, consider a U-shaped magnet of mass *M*, which rests on a sensitive electronic balance as shown in the given figure. The conducting wire *X* is removed from between the magnets and then it is placed between the poles of the U-shape magnet. The wire is oriented perpendicular to the plane of the paper in the same way as in between the magnets in the previous situation.



What will happen to the reading on the electronic scale?

- A. It will be more than *M*.
- B. It will be less than *M*.
- C. It will be equal to *M*.
- D. It will fluctuate continuously.

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