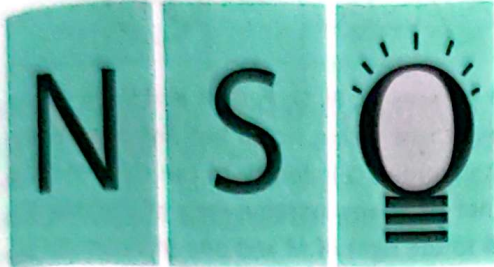
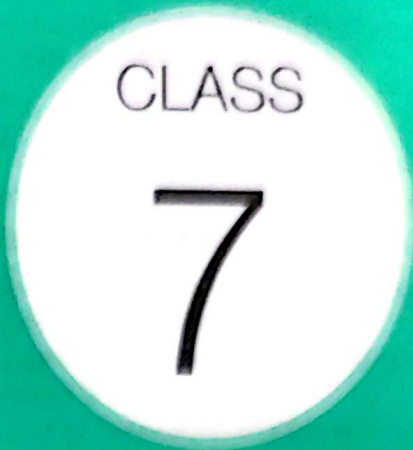
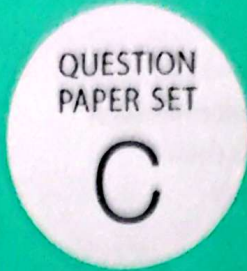




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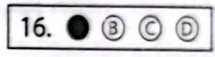


Total Questions : 50

Time : 1 hr.

Guidelines for the Candidate

- You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
- 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.
- 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 1 mark each.
- All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
- There is only ONE correct answer. Choose only ONE option for an answer.
- 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.
- Rough work should be done in the blank space provided in the booklet.
- Return the OMR Sheet to the invigilator at the end of the exam.
- Please fill in your personal details in the space provided before attempting the paper.
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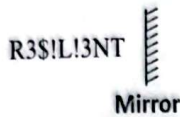
LOGICAL REASONING

1. Which of the following numbers will complete the given number series?

30, 68, 130, 222, 350, ?

- A. 621 B. 711
C. 520 D. 509

2. Select the correct mirror image of the given combination of letters, numbers and symbols.



- A. R3\$!L!3NT
B. T!E!L!2E!R
C. !N!E!T!S!E!
D. T!E!N!2!E!R

3. Three different positions of a dice are shown below. Which number is on the face opposite to the face having number 2?

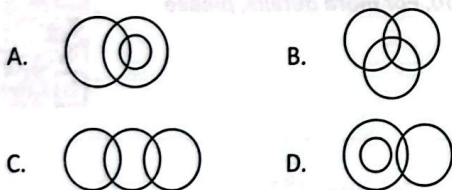


- A. 4 B. 3
C. 5 D. 1

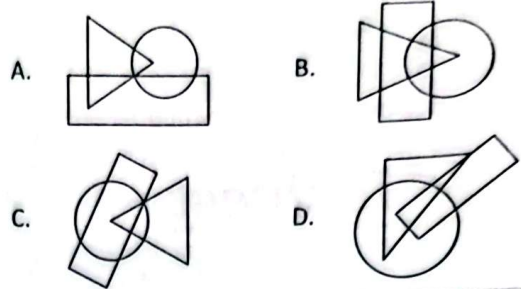
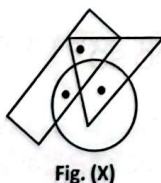
4. Pointing towards a lady, a boy said, "She is the mother of my father's only son-in-law." How is that lady related to that boy's brother-in-law?

- A. Mother-in-law
B. Sister
C. Mother
D. Can't be determined

5. Which of the following Venn diagrams best represents the relationship amongst, "Adults, Males and Nephews"?



6. Select a figure from the options which does not satisfy the same conditions of placement of the dots as in the given Fig. (X).

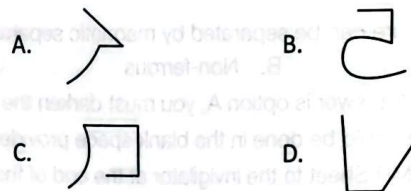
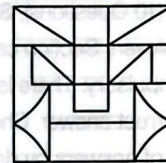


7. Seven persons M, N, O, P, Q, R and S are sitting in a straight row facing North but not necessarily in the same order. O is fourth to the right of N, who does not sit at any extreme ends of the row. S sits fourth to the right of M and one of them sits at an extreme end of the row. R sits to the immediate right of O, who sits second to the right of P.

Who among the following sits third to the left of O?

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

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



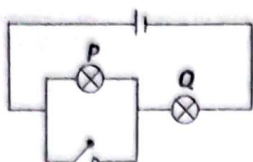
9. If '*' denotes 'x', '#' denotes '-', '@' denotes '÷' and '©' denotes '+', then which of the following equations is correct?

- A. $250 * 86 © 246 @ 6 # 3 = 213$
B. $250 © 86 # 246 @ 6 * 3 = 213$
C. $250 # 86 © 246 * 6 @ 3 = 213$
D. $250 @ 86 # 246 © 6 * 3 = 213$

10. In a certain code language, if 'RESOURCE' is written as 'PUHVFEUY', then how will 'RESTRICT' be written in the same code language?

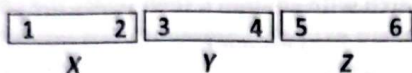
- A. UUVVUULU
B. VUVVUULU
C. UUVVUULV
D. UUVVUULU

11. The given figure shows a circuit which contains two identical lamps *P* and *Q*. When the switch is closed, which one of the following statements best describes, what happened to lamps *P* and *Q*?



- A. *P* is brighter than before, but *Q* does not light up.
- B. *P* does not light up, but *Q* is brighter than before.
- C. Both *P* and *Q* are brighter than before.
- D. Both *P* and *Q* will not light up.

12. In the given figures, three identical metal bars *X*, *Y* and *Z* are suspected of being magnets. It is found that there is attraction between poles 1 and 6, between 2 and 4, and between 2 and 6. However, there is repulsion between poles 2 and 3.



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

- I. Pole 6 can be attracted to 1 and 2 at the same time.
 - II. *X* and *Y* are magnets.
 - III. Poles 2 and 5 would repel each other.
 - IV. All three metal bars are magnets.
- | | I | II | III | IV |
|----|---|----|-----|----|
| A. | F | F | T | T |
| B. | T | F | F | F |
| C. | F | T | F | F |
| D. | F | F | T | F |

13. The states of four objects *P*, *Q*, *R* and *S* is given in the table.

Object	State at 10°C	State at 40°C	State at 90°C
<i>P</i>	Liquid	Liquid	Gaseous
<i>Q</i>	Solid	Solid	Liquid
<i>R</i>	Solid	Liquid	Gaseous
<i>S</i>	Liquid	Gaseous	Gaseous

Which object has the lowest boiling point?

- A. *P*
 - B. *Q*
 - C. *S*
 - D. *R*
14. In an eight-hour journey, find the distance covered in first 6 hours. Given that the distance covered from 6 to 8 hours is 260 km and the average speed of the journey is 60 km/h.
- A. 250 km
 - B. 260 km
 - C. 200 km
 - D. 220 km

15. A pendulum takes 1.5 seconds to swing from rest position *P* to its maximum displacement position *Q*.



Which of the following statements is/are correct?

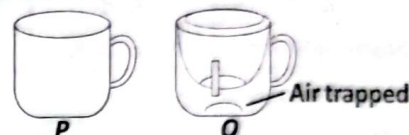
- I. Time taken for the pendulum to make 20 oscillations is 120 seconds.
 - II. Time taken for the pendulum to make one quarter of an oscillation is 1.5 seconds.
 - III. Time period is independent of length of pendulum.
- A. I only
 - B. II only
 - C. I and II only
 - D. I, II and III

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

Statement 1: Meteors are known as shooting stars.
Statement 2: Comets are not visible from the Earth.

- A. Both statement 1 and statement 2 are correct.
- B. Both statement 1 and statement 2 are incorrect.
- C. Statement 1 is correct but statement 2 is incorrect.
- D. Statement 1 is incorrect but statement 2 is correct.

17. The given figure *P* shows a single-wall cup and figure *Q* shows a double-wall cup.



Which of the following statements is/are correct?

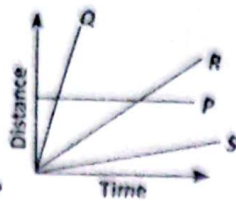
- I. Cup *Q* will keep hot water hotter for a longer period of time than cup *P*.
 - II. Cup *P* will keep cold water colder for a longer period of time than cup *Q*.
 - III. Cup *P* will allow cold water to reach room temperature faster than cup *Q*.
- A. III only
 - B. I and II only
 - C. I and III only
 - D. I, II and III

18. A man looked into a plane mirror on a wall. He saw the image of a clock behind him as shown in the given figure. Time shown by the clock in the mirror was



- A. 5 : 20
- B. 6 : 40
- C. 11 : 50
- D. 12 : 10

19. The given figure shows distance-time graphs of different objects P, Q, R and S. Which one of the given objects has maximum speed?



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

20. In the given electric circuit, how many minimum number of switches need to be closed to light up only four bulbs?

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



21. Which of the following factors decrease(s) the rate of evaporation?

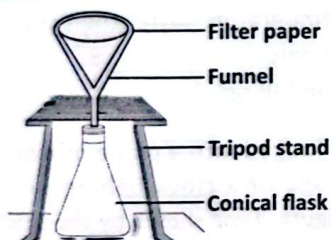
- I. Increase in surface area
II. Increase in humidity
III. Decrease in temperature
IV. Increase in wind speed
- A. I only
B. III and IV only
C. II and III only
D. I and IV only

22. Refer to the given table and select the option that correctly identifies P, Q and R.

Substance	Colour change of methyl orange	Colour change of turmeric solution
Milk of magnesia	P	Red
Q	Red	No change
Sugar solution	No change	R

- | P | Q | R |
|-----------|---------------|-----------|
| A. Yellow | Amla juice | No change |
| B. Red | Soap solution | Green |
| C. Yellow | Salt solution | No change |
| D. Red | Lemon juice | Yellow |

23. Refer to the given diagram of a method of separation of substances.

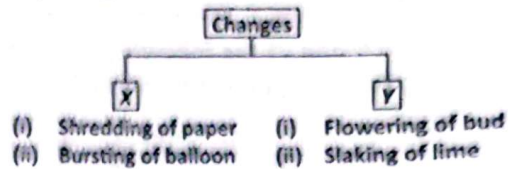


Which of the following cannot be separated by using this method?

- I. Tea leaves from tea
II. Mud from muddy water
III. Salt from sea water
IV. Oil from water
V. Butter from curd

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

24. Study the given flow chart carefully.



Identify X and Y.

- | X | Y |
|-----------------------------------|--------------------------------|
| A. Physical, reversible changes | Chemical, irreversible changes |
| B. Chemical, irreversible changes | Physical, irreversible changes |
| C. Physical, irreversible changes | Chemical, irreversible changes |
| D. Chemical, reversible changes | Physical, irreversible changes |

25. Unscramble the properties given in column II and match with column I, then select the correct option.

- | Column I | Column II |
|-----------------------------------|-------------------|
| P. Sponge | (i) LLOUBENIS |
| Q. Air | (ii) OTFS |
| R. Salt in water | (iii) RPNRTAETSNI |
| S. Chalk powder in water | (iv) BULLEOS |
| A. P-(ii), Q-(iii), R-(iv), S-(i) | |
| B. P-(iii), Q-(ii), R-(iv), S-(i) | |
| C. P-(ii), Q-(iv), R-(i), S-(iii) | |
| D. P-(iii), Q-(ii), R-(i), S-(iv) | |

26. Select the correct statements among the following.

- I. Window cleaner which contains ammonium hydroxide can turn China rose indicator to dark pink.
- II. During neutralisation reaction, evolution of heat takes place.
- III. Acidic soil can be neutralised by adding organic matter like manure.
- IV. Wasp sting contains an acid which can be neutralised by rubbing baking soda.
- V. Soda water has pH value less than 7 whereas lime water has pH value greater than 7.
- A. I, II, III and V only
B. II and V only
C. I, III and IV only
D. II, III and IV only

27. Observe the given reactions carefully.

- I. Magnesium + Oxygen \rightarrow Magnesium oxide
- II. Iron + Oxygen + Water \rightarrow Iron oxide (Rust)

Some statements are given regarding these reactions, read them carefully and select the option that correctly identifies them as true (T) or false (F) ones.

- P. Reaction I results in the evolution of heat and light.
 Q. Both reactions I and II are grouped under chemical changes and are involved in the formation of new substances having properties totally different from the original substances.
 R. Rust formation in reaction II is an example of oxidation reaction which slows down in salty water.

	P	Q	R
A.	T	T	F
B.	T	F	T
C.	T	F	F
D.	F	T	T

28. Which of the following groups of samples will not show any change in colour with China rose indicator?
- Vinegar, curd and sugar solution
 - Distilled water, sodium chloride solution and sugar solution
 - Baking soda solution, window cleaner and lime water
 - Lime water, soap solution and lemon juice

29. Given are the few processes that take place during digestion of food but in a random order.
- Food is partially digested and bacteria present in the food are killed.
 - Digestion is completed and nutrients are absorbed.
 - Food is moistened and breakdown of starch begins.
 - Water and some salts from undigested food are absorbed.

Select the option that correctly arranges these processes in an order as the food passes through the human digestive tract.

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

30. Read the given paragraph.

Carnivores have highly developed (i) to tear off flesh easily. Most rodents have highly developed (ii) for gnawing their food. On the other hand, animals like baleen whales and (iii) are toothless.

Now, select the option that correctly fills the blanks (i)-(iii) respectively.

- Incisors, Molars, Scaly anteaters
- Canines, Premolars, Walruses
- Canines, Incisors, Spiny anteaters
- Premolars, Canines, Elephants

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

Statement 1: Plants growing in salty marshes have specialised roots called pneumatophores.

Statement 2: Soil of salty marshes is deficient in oxygen and these pneumatophores bear small pores that help in gaseous exchange.

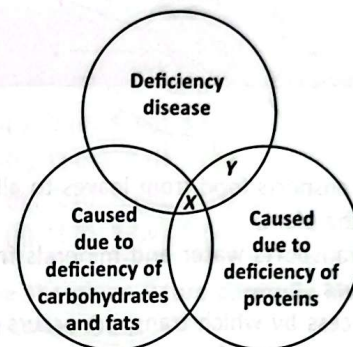
- Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- Statement 1 is true but statement 2 is false.
- Statement 1 is false but statement 2 is true.

32. Match the columns and select the correct option from the codes given below.

Column I (Enzyme)	Column II (Digestion activity)
(a) Salivary amylase	(i) Breaks down proteins into peptides
(b) Trypsin	(ii) Changes sucrose into glucose and fructose
(c) Sucrase	(iii) Breaks down peptides into amino acids
(d) Peptidase	(iv) Changes starch to sugar

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

33. Refer to the given Venn diagram and select the option that correctly identifies X and Y.



- | | X | Y |
|----|-------------|-------------|
| A. | Anaemia | Rickets |
| B. | Rickets | Anaemia |
| C. | Kwashiorkor | Marasmus |
| D. | Marasmus | Kwashiorkor |

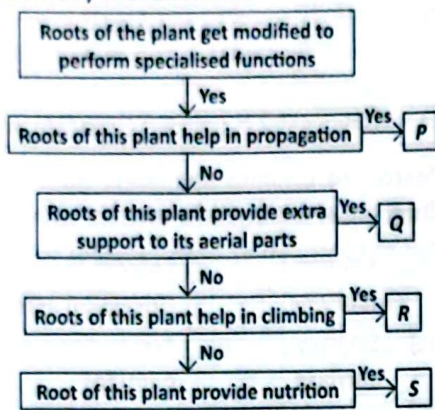
34. Names of few plants are given in the box.

1. Mustard	2. Carrot	3. Turnip
4. Chickpea	5. Paddy	6. Maize
7. Onion	8. Wheat	

Now, select the correct option that generally classifies them on the basis of their lifespan.

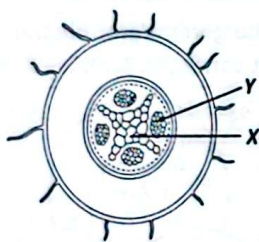
	Annual plant	Biennial plant
A.	1, 3, 7, 8	2, 4, 5, 6
B.	1, 4, 5, 6, 8	2, 3, 7
C.	3, 5, 7, 8	1, 2, 4, 6
D.	4, 6, 7, 8	1, 2, 3, 5

35. Refer to the given flow chart and select the option that correctly identifies P-S.



	P	Q	R	S
A.	Maize	Sugarcane	Orchid	Mistletoe
B.	<i>Asparagus</i>	Dodder	Ivy plant	Bamboo
C.	Sweet potato	Maize	Balsam	Turnip
D.	<i>Dahlia</i>	Banyan	Moneyplant	<i>Cuscuta</i>

36. Refer to the given figure of transverse section of root. Identify the vascular tissues X and Y and select the correct statement regarding them.



- A. X transports food from leaves to all other parts of the plant.
 B. Y transports water and minerals from roots to leaves.
 C. Process by which transport occurs through X is called ascent of sap.
 D. Y transports substances only in the upward direction.

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

- (i) Fossil fuels are renewable resources and non-polluting sources of energy.
 (ii) Soil is formed by breaking down rocks due to the action of Sun, wind, water and microorganisms.
 (iii) Rocks formed due to cooling and solidification of magma or lava are called sedimentary rocks.
 (iv) *Bawadi* is a traditional rainwater harvesting practice in Rajasthan.

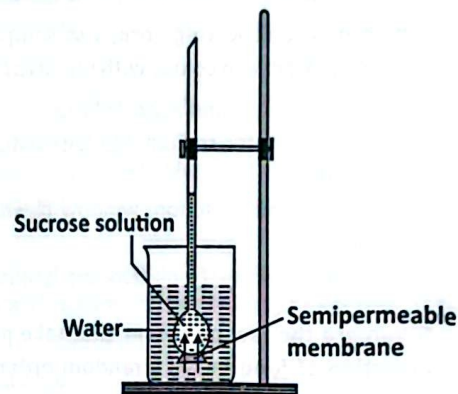
	(i)	(ii)	(iii)	(iv)
A.	T	T	F	F
B.	T	F	T	T
C.	F	T	F	T
D.	F	F	T	F

38. Unscramble the given letters to get a meaningful term and select the correct statement regarding it.

PIGELTOTIS

- A. It prevents the trachea from collapsing during breathing when pressure changes occur in the chest cavity.
 B. It is the site of gaseous exchange between air in the lungs and the blood in capillaries.
 C. It helps in sound production and contains the vocal cords.
 D. It prevents the entry of food into the lungs.

39. Identify the process shown in the given figure.



This process is also responsible for

- A. Absorption of water by the roots of a plant
 B. Absorption of sunlight by the leaves of a plant
 C. Respiration in yeast
 D. All of these.

40. The exhaled air and inhaled air have different percentages of carbon dioxide and oxygen. Select the option that correctly matches them.

	Exhaled air		Inhaled air	
	CO ₂	O ₂	CO ₂	O ₂
A.	21%	0.04%	16.4%	4.4%
B.	4.4%	16.4%	0.04%	21%
C.	16.4%	4.4%	0.04%	21%
D.	21%	4.4%	16.4%	0.04%

41. Refer to the given analogies and select the option that correctly identifies (i) and (ii).

- (a) Vitamin B₃ : Niacin :: Vitamin B₉ : (i)
 (b) Iron : Anaemia :: (ii) : Hyponatremia

	(i)	(ii)
A.	Thiamine	Phosphorus
B.	Riboflavin	Potassium
C.	Folic acid	Sodium
D.	Cobalamin	Fluorine

42. Read the given paragraph.

Sometimes, during strenuous activity such as long distance running, your body cannot get enough (i) to

produce the required energy. To get the additional energy, (ii) respiration occurs within your muscle cells. In this process, there is partial breakdown of (iii) to produce (iv), the accumulation of which in the body causes (v).

Complete the above paragraph by selecting the correct sequence of words that fill in the blanks (i)-(v) respectively.

- A. Food, Aerobic, Starch, Uric acid, Uremia
- B. Carbon dioxide, Anaerobic, Protein, Lactic acid, Bone pain
- C. Oxygen, Aerobic, Fructose, Hydrochloric acid, Muscular cramps
- D. Oxygen, Anaerobic, Glucose, Lactic acid, Muscular cramps

43. Which of the following statements is/are incorrect?

- (i) Green plants prepare food in the form of starch and store it as glucose in various parts.
- (ii) The organisms which synthesise their own food with the help of simple inorganic substances are called autotrophs.
- (iii) Maximum photosynthesis occurs in the green region of the light spectrum.
- (iv) The rate of photosynthesis increases with the increase in light intensity upto a certain limit.

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

44. Select the incorrect match of the rock and its use.

- A. Granite – Making kitchen countertops
- B. Pumice – Polishing teeth
- C. Marble – Making statues
- D. Slate – Making surgical blades

45. Read the given statements regarding adaptations shown by the organisms W, X, Y and Z.

- (i) W passes very concentrated urine.
- (ii) X has a layer of blubber under its skin.
- (iii) Y has needle-like leaves covered with a thick, waxy layer called the cuticle.
- (iv) Z possesses air spaces in its stem and is usually long and flexible.

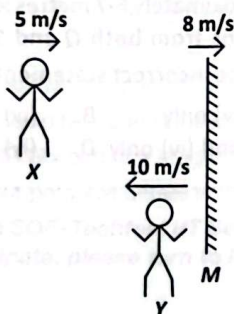
Now, select the option that correctly identifies the habitat of organisms W, X, Y and Z.

	W	X	Y	Z
A.	Grassland	Polar	Rainforest	Desert
B.	Mountain	Aquatic	Desert	Grassland
C.	Polar	Desert	Aquatic	Mountain
D.	Desert	Polar	Mountain	Aquatic

ACHIEVERS SECTION

46. Consider the situation shown in the given figure. Person X and Y are moving towards each other. The mirror M is moving towards right from X and Y.

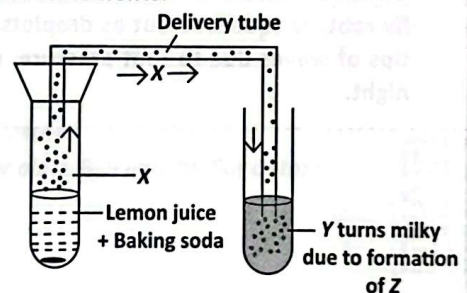
Now, match column I with column II. Select correct option from the given codes.



Column I	Column II
P. Velocity of image of X as observed by an observer on the ground is	(i) 3 m/s
Q. Velocity of image of X as observed with respect to the mirror is	(ii) 11 m/s
R. Velocity of image of X as observed by X is	(iii) 6 m/s
S. Velocity of image of X as observed by Y is	(iv) 21 m/s

- A. P-(i), Q-(ii), R-(iv), S-(iii)
- B. P-(ii), Q-(iii), R-(iv), S-(i)
- C. P-(ii), Q-(i), R-(iii), S-(iv)
- D. P-(ii), Q-(i), R-(iv), S-(iii)

47. Observe the given figure carefully and identify the correct statements.



- I. Gas X is carbon dioxide which turns lime water (Y) milky.
 - II. The chemical name of lime water (Y) is calcium hydroxide.
 - III. The formation of Z indicates a chemical reversible change.
 - IV. Z is calcium carbonate which is soluble in water.
 - V. When moist red litmus paper comes into contact with gas X, it turns blue.
- | | |
|------------------------|--------------------------|
| A. I and II only | B. I, II and IV only |
| C. II, III and IV only | D. I, II, III and V only |

48. Read the given paragraph where few words have been italicised and select the correct statement regarding them.

Respiration is the process by which living organisms break down food in the presence of *carbon dioxide* to release energy. Two main processes of respiration are breathing and cellular respiration.

Different organisms have different ways of breathing. Insects, like *grasshoppers*, breathe through small openings on their body surface called *trachea*, which are connected to a network of air tubes called *spiracles*. Fishes breathe through *pulmonary* respiration. Earthworms breathe through *tracheal* respiration.

Plants also respire. The gaseous exchange in plants occurs mainly due to *osmosis* through stomata. *Lenticels* and root surface also take part in gaseous exchange. The opening and closing of stomata is guarded by *three* bean-shaped guard cells.

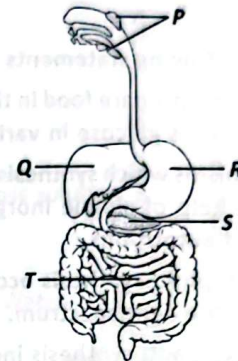
- Carbon dioxide* should not be changed as it is mentioned correctly whereas *grasshoppers* should be changed to *earthworms*.
- The positions of *trachea* and *spiracles* should be interchanged whereas *pulmonary* should be changed to *branchial* as it is mentioned incorrectly.
- Tracheal* should be changed to *cutaneous* whereas *osmosis* should not be changed as it is mentioned correctly.
- Lenticels* should be changed to *sieve tubes* whereas *three* should not be changed as it is mentioned correctly.

49. Which of the following statements are incorrect?

- Transport of water and minerals occur through the xylem fibres.
- Guttation occurs when extra water absorbed by roots is squeezed out as droplets from the tips of leaves due to root pressure, usually at night.

- When the rate of transpiration is high, the absorption of water by roots decreases.
 - Food is transported through the elongated cells of phloem called companion cells.
 - Water is a by-product of photosynthesis in plants which is removed by transpiration.
- (i) and (ii) only
 - (iii) and (v) only
 - (i), (iii), (iv) and (v) only
 - (ii), (iii) and (iv) only

50. Identify the labelled parts P-T in the given figure of human digestive system and read the following statements regarding them.



- Two pairs of P are present in the buccal cavity and their secretion helps to breakdown fats into simple sugars.
- Q is a reddish-brown coloured gland whose secretion does not contain any digestive enzymes.
- R is the widest part of our alimentary canal whose secretion kills bacteria present in the food.
- S is the largest gland of our body which stores the secretion of gall bladder.
- T is approximately 6-7 metres long and it receives secretions from both Q and S.

Now, select the incorrect statement(s) regarding P-T.

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

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Head Office: Plot 99, Sector 44 Institutional area, Gurugram -122 003 (HR), India
Email: info@sofworld.org | Website: www.sofworld.org