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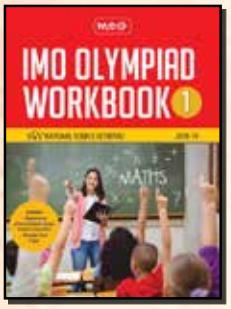

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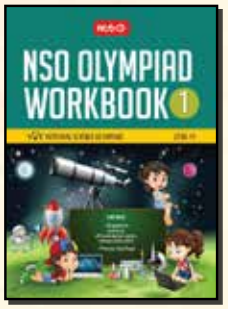

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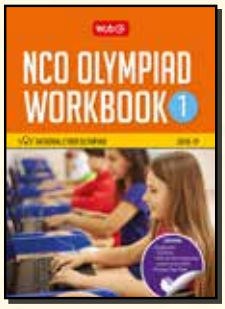

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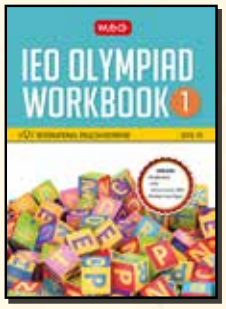

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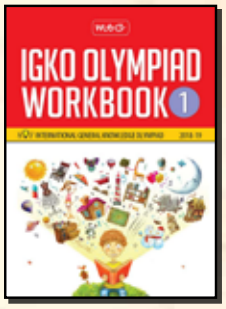

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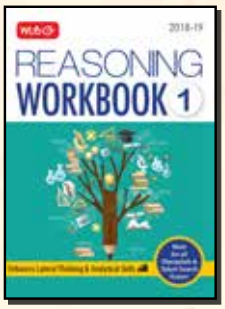

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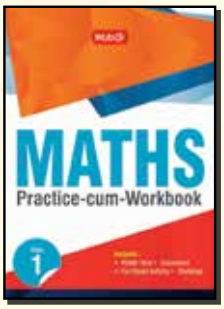

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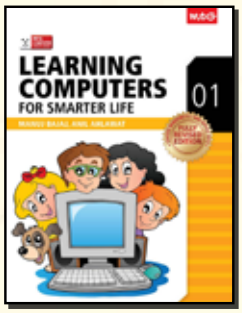

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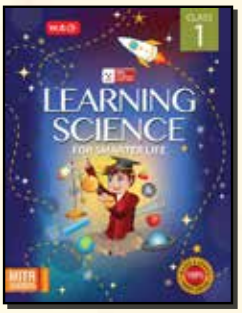

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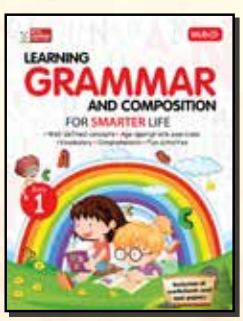

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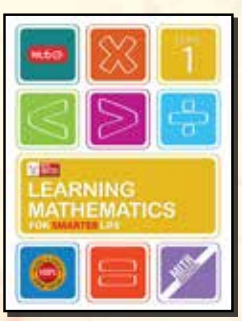

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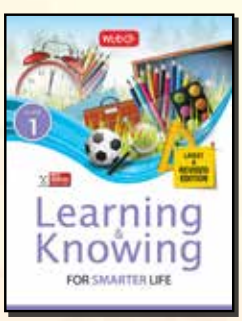

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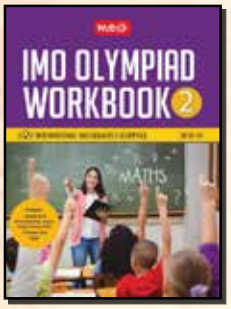

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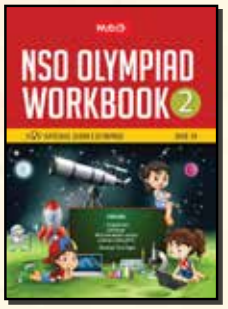

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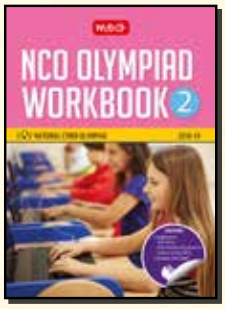

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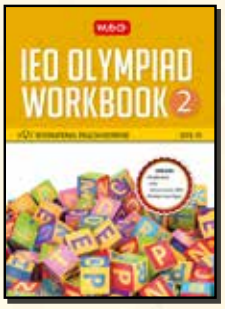

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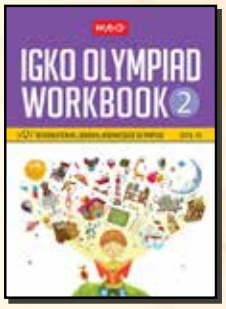

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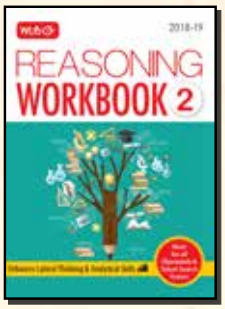

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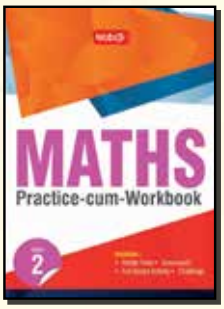

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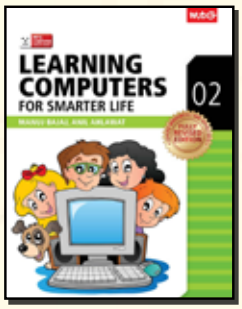

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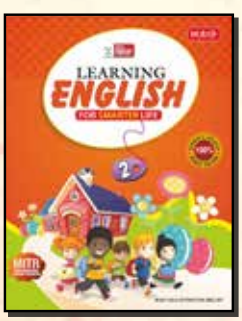

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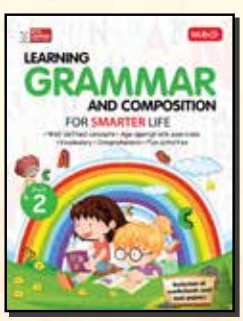

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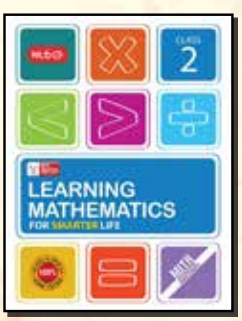

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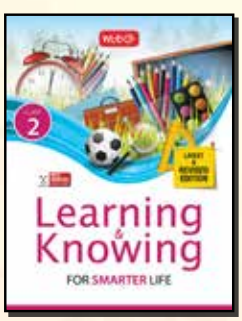

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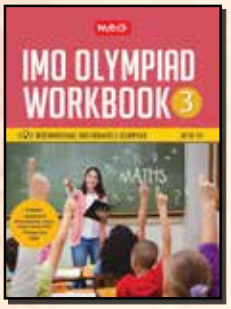

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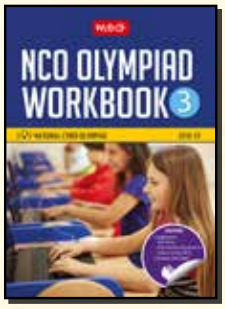

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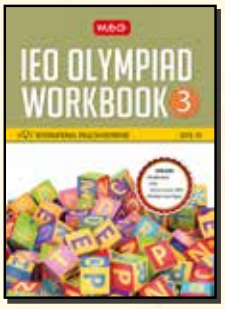

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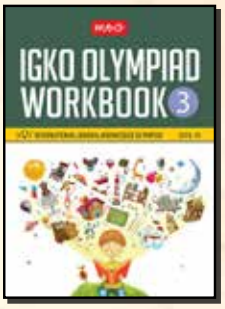

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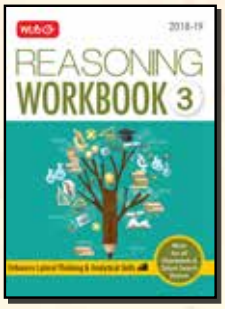

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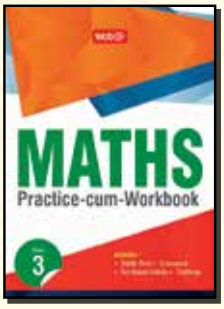

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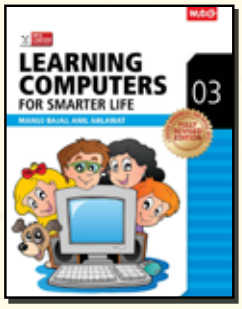

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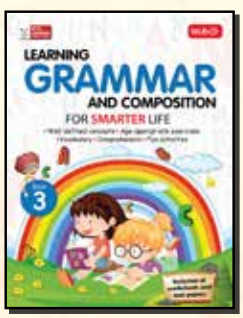

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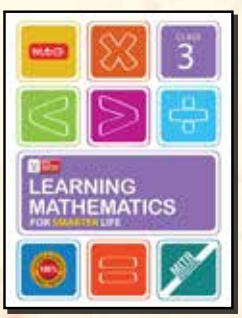

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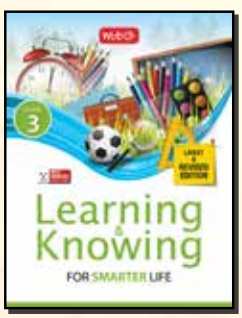

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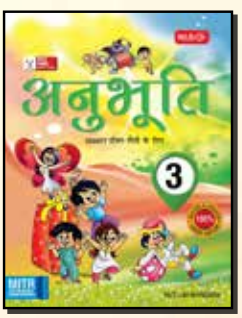

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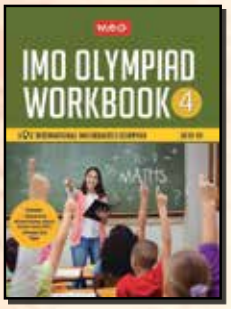

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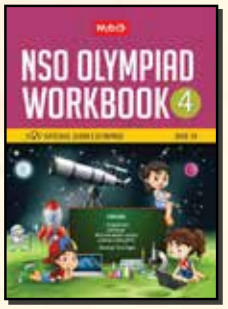

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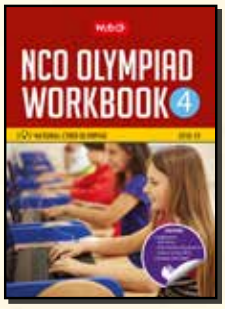

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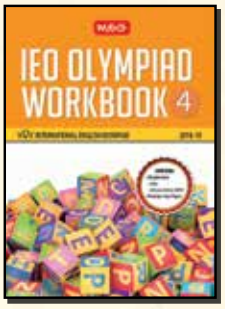

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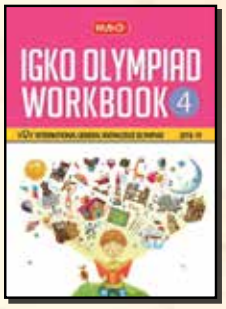

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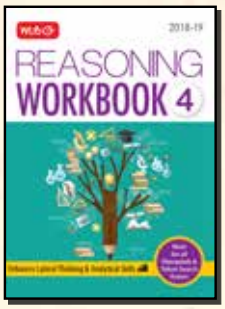

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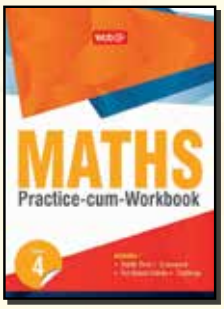

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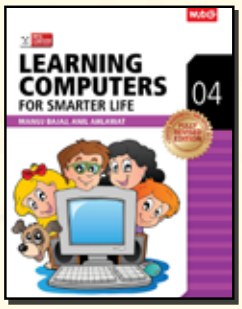

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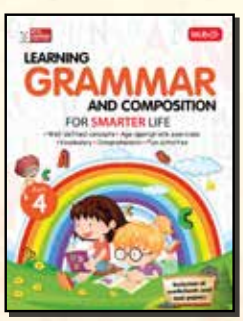

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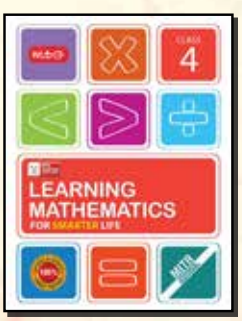

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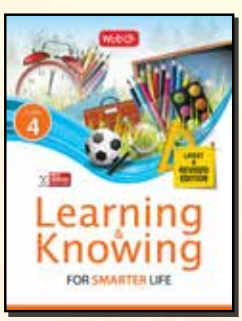

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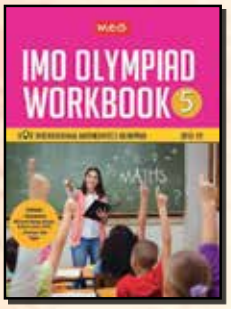

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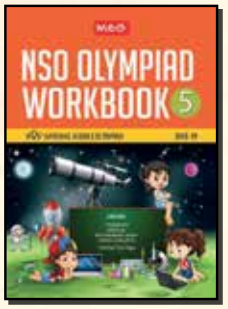

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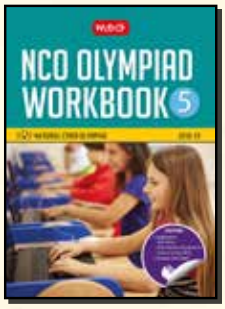

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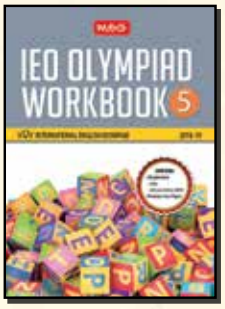

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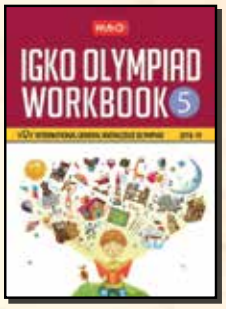

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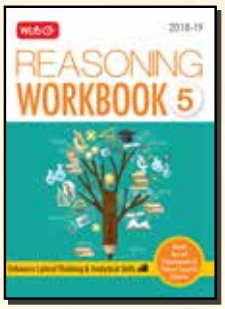

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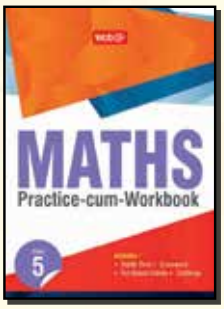

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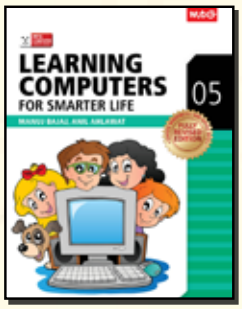

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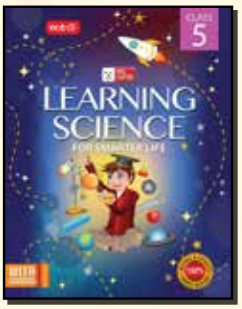

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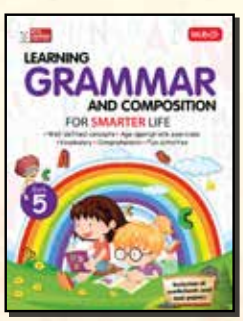

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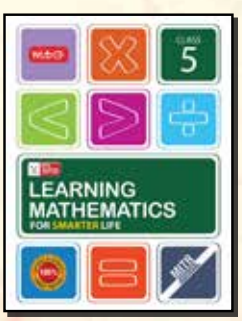

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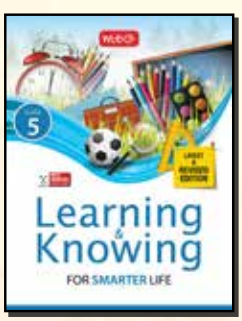

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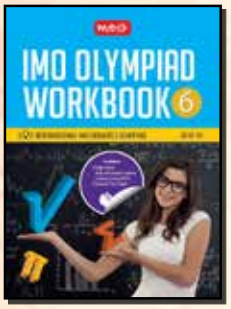

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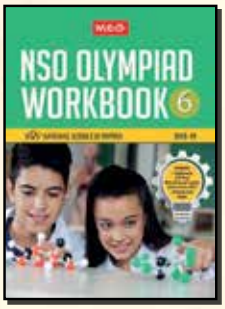

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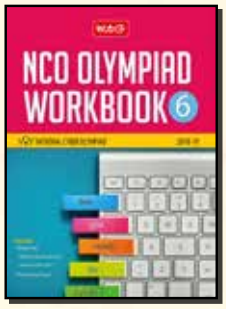

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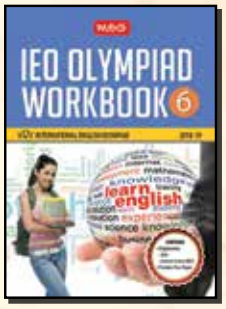

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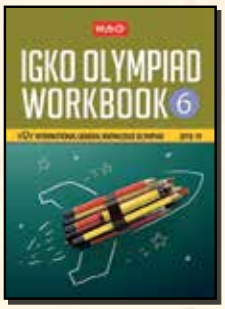

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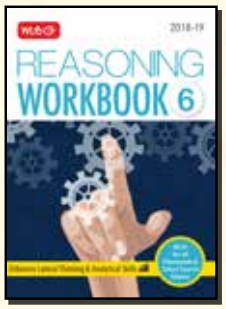

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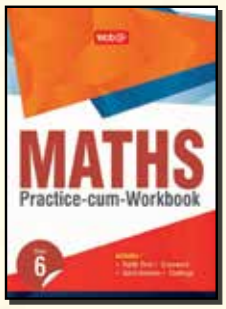
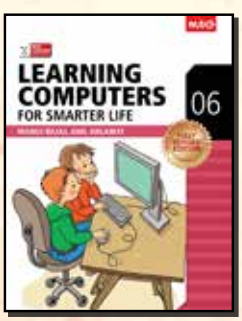


Maths Practice-cum-Workbook

Science Practice-cum-Workbook



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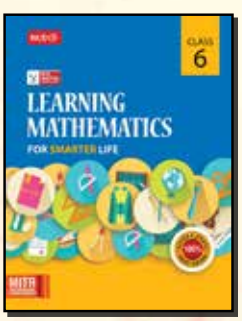

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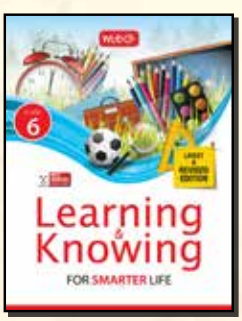

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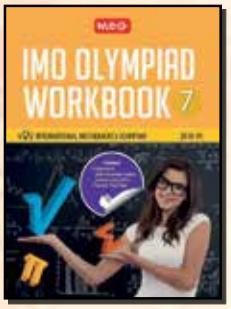

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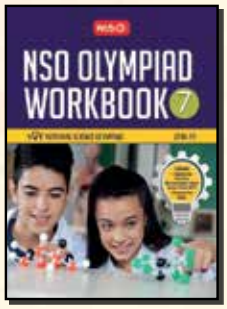

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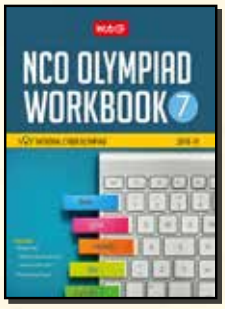

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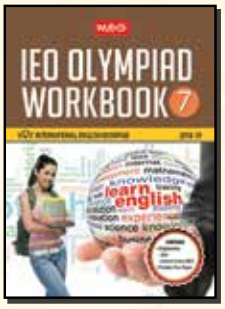

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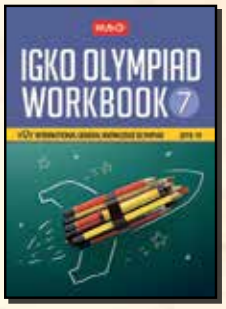

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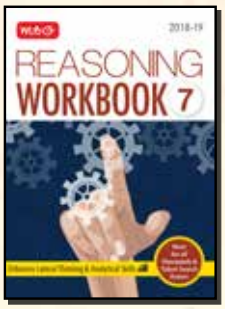

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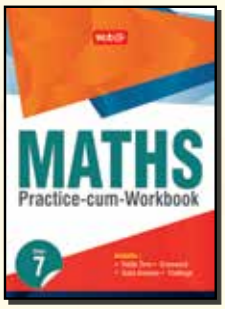
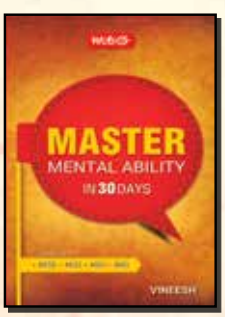


Maths Practice-cum-Workbook

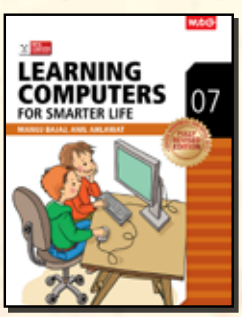
Science Practice-cum-Workbook

Math IQ Challenge

Science IQ Challenge



Master Mental Ability in 30 Days



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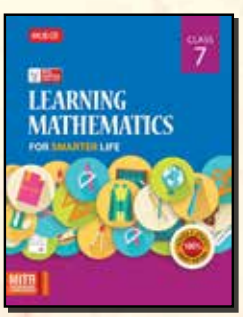

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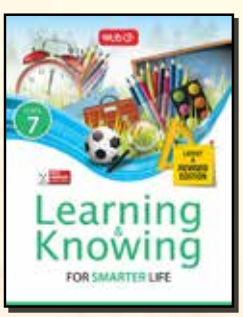

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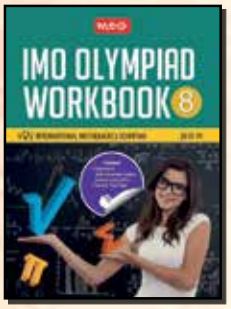
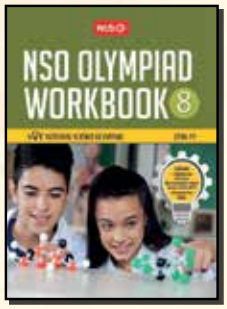


International Mathematics Olympiad



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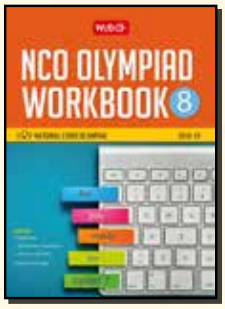

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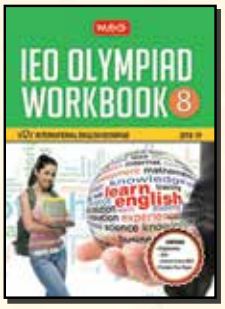

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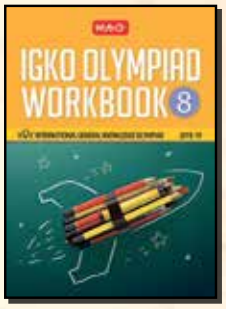
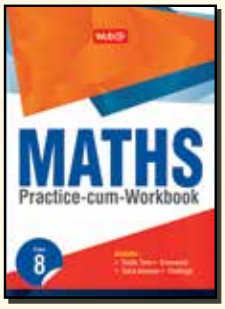


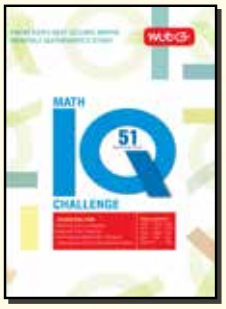
International General Knowledge Olympiad

Reasoning



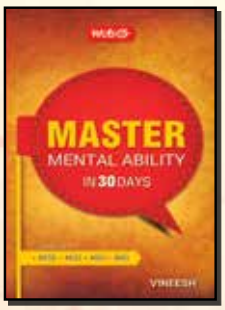
Maths Practice-cum-Workbook

Science Practice-cum-Workbook

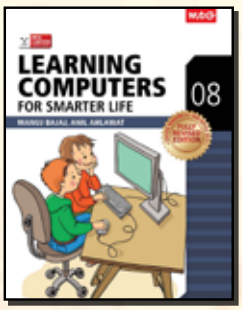


Math IQ Challenge

Science IQ Challenge



Master Mental Ability in 30 Days



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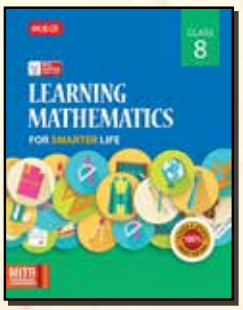

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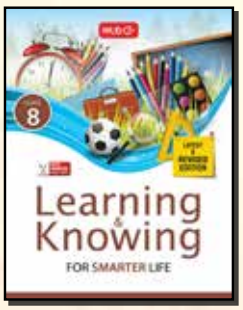

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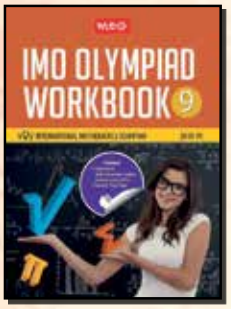
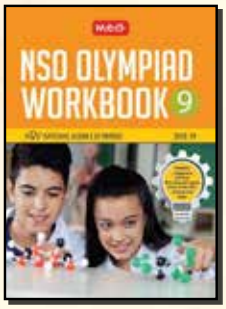


International Mathematics Olympiad



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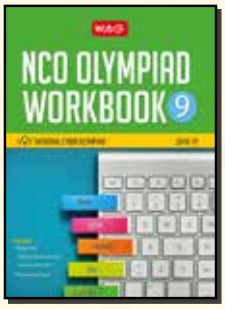

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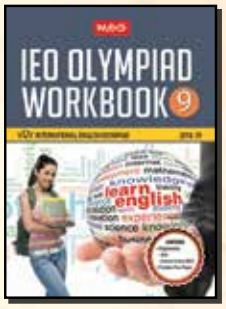

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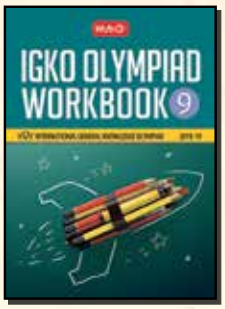
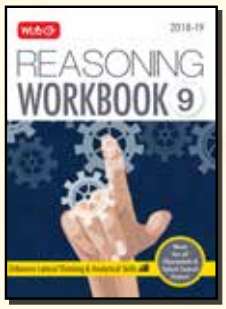


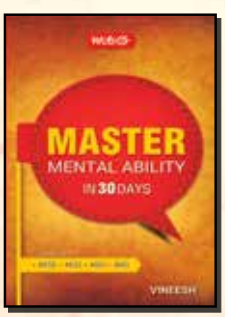
International General Knowledge Olympiad



Reasoning

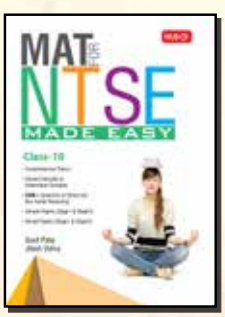
Math IQ Challenge

Science IQ Challenge



Master Mental Ability in 30 Days

Psychology of Success



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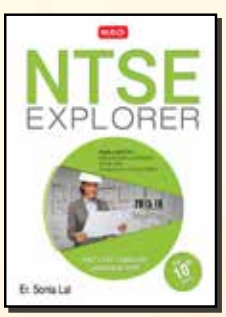

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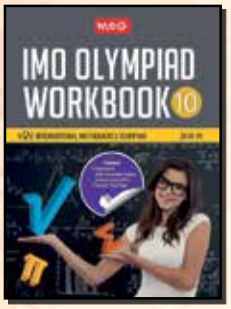

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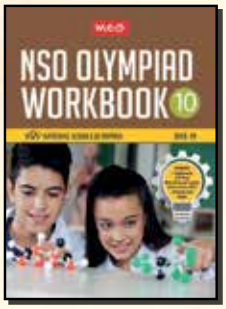

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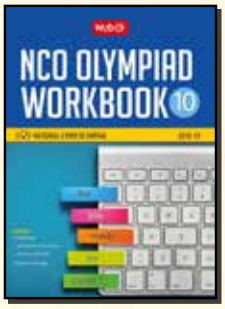

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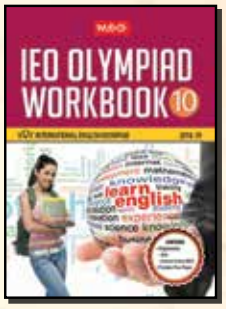

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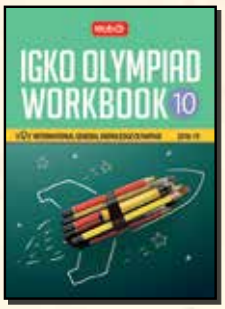
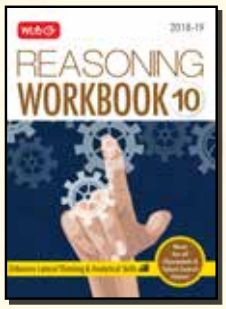


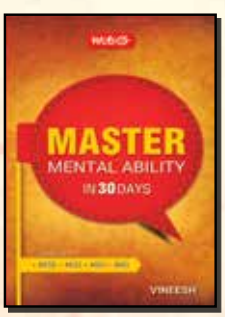
International General Knowledge Olympiad



Reasoning

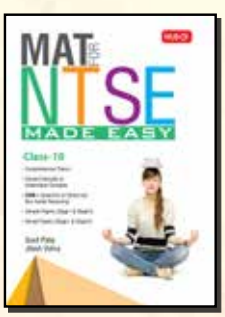
Math IQ Challenge

Science IQ Challenge

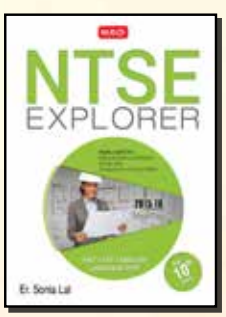


Master Mental Ability in 30 Days

Psychology of Success



MAT for NTSE



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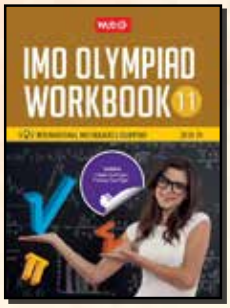

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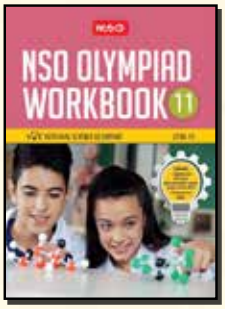

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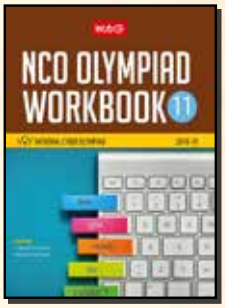
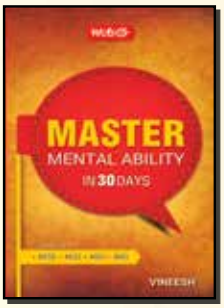


National Cyber Olympiad

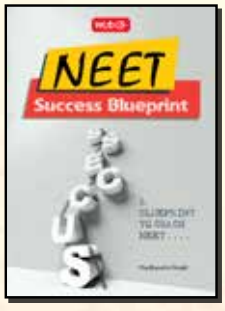
Math IQ Challenge

Science IQ Challenge



Master Mental Ability in 30 Days

Psychology of Success



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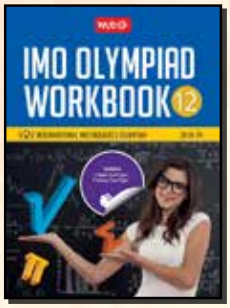
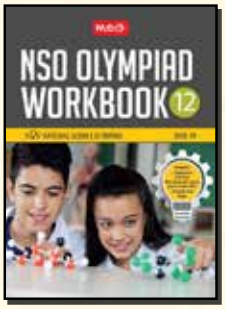
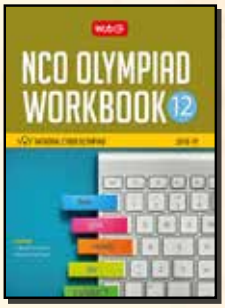


International Mathematics Olympiad



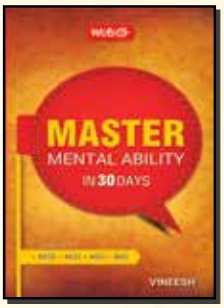
National Science Olympiad



National Cyber Olympiad

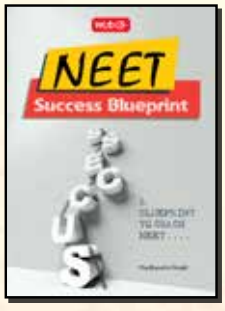
Math IQ Challenge

Science IQ Challenge



Master Mental Ability in 30 Days

Psychology of Success



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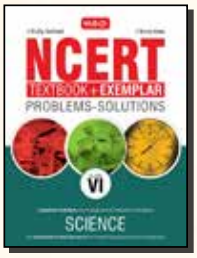
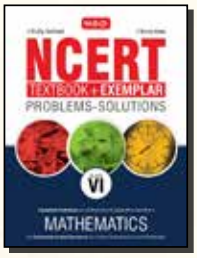
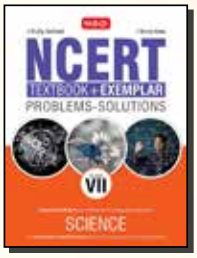
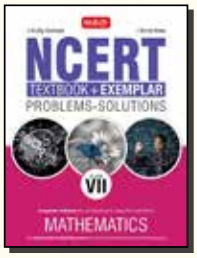


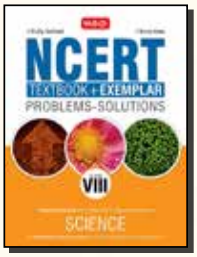


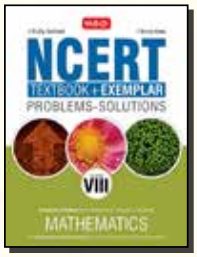
Class 7



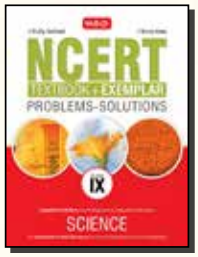


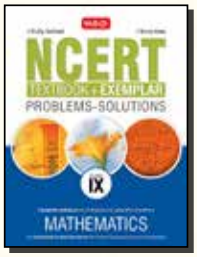
Class 8





Class 9





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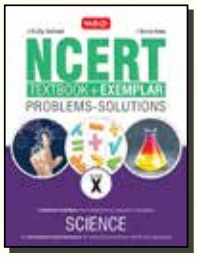
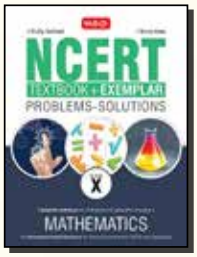
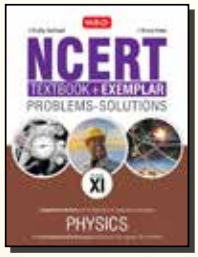
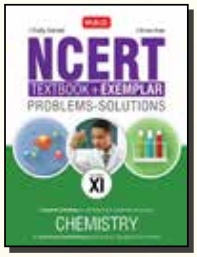
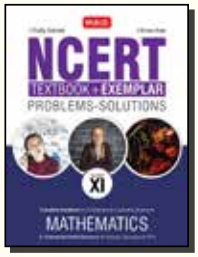


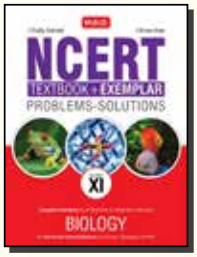


11 Class

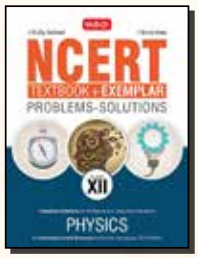


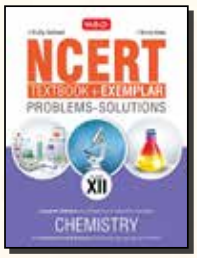


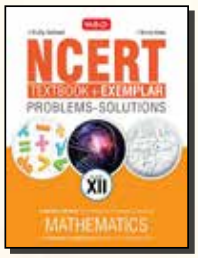


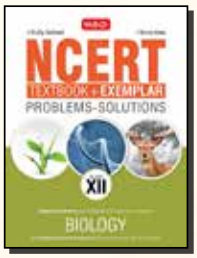


12 Class









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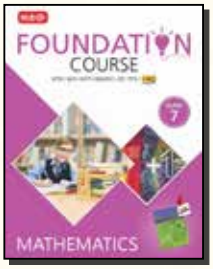
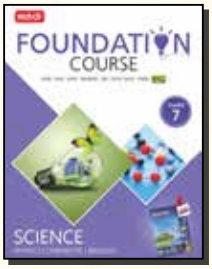
FOUNDATION COURSE

For Classes 6, 7, 8, 9 & 10

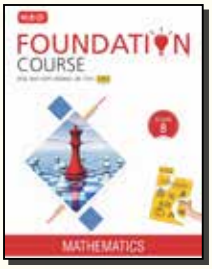
Class 6

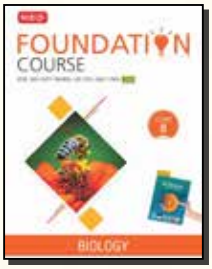
Class 7





Class 8





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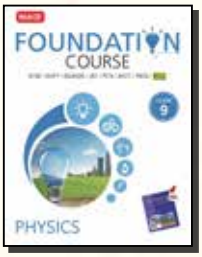

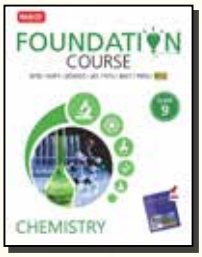

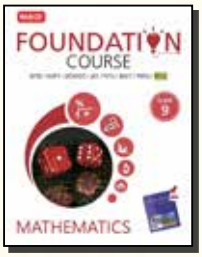

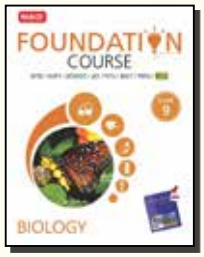

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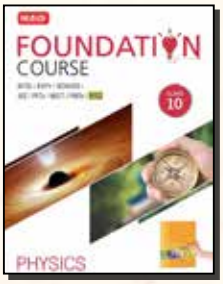
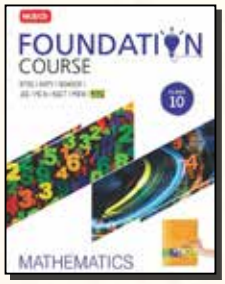
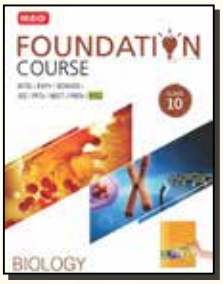






SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set A

Year 2013

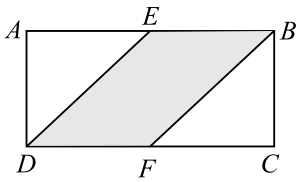
1. Which property holds in the given below statement?

$$a \times (b + c) = (a \times b) + (a \times c)$$

A. Property of division
B. Multiplicative identity of multiplication
C. Distributive property of multiplication distributes over addition
D. Distributive property of addition distributes over multiplication

---

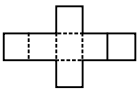
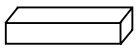
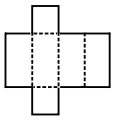
2. *ABCD* is a rectangle, *E* is the mid-point of *AB* and *F* is the mid-point of *DC*. What percentage of the rectangle is unshaded?



A. 50%
B. 25%
C. 15%
D. 75%

---

3. Select the correct match.

	Solid	Net
A.		
B.		
C.		
D.		

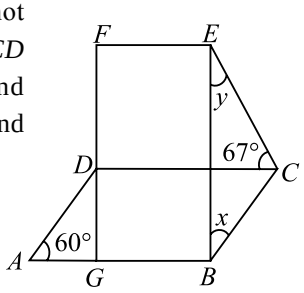
---

4. Find the value of $(2^{1001} - 2^{1000}) \div (2^{501} - 2^{500})$.

A. 2^{2000}
B. 2^{500}
C. 2^{1000}
D. 2^{200}

---

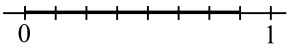
5. In the given figure (not drawn to scale), *ABCD* is a parallelogram and *GBEF* is a rectangle. Find $x - y$.

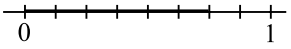


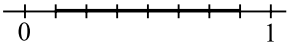
A. 7°
B. 8°
C. 6°
D. 9°

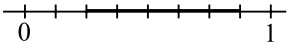
---

6. On which number line dark portion represents the sum $\frac{3}{8} + \frac{1}{2}$.

A. 

B. 

C. 

D. 

---

7. Select the wrong step in the simplification of

$24 - [2.4 - \{0.24 \times 2 - (0.024 - x)\}] = 22.0584$

(i) $24 - [2.4 - \{0.24 \times 2 - (0.024 - x)\}] = 22.0584$
(ii) $24 - [2.4 - \{0.48 - 0.024 - x\}] = 22.0584$
(iii) $24 - [2.4 - 0.456 - x] = 22.0584$
(iv) $24 - 1.944 + x = 22.0584$
(v) $x = 22.0584 - 22.056 = 0.0024$

A. Both (ii) and (iii)
B. Only (ii)
C. Only (v)
D. Both (iii) and (iv)

---

8. The given table shows the weights of some marbles.

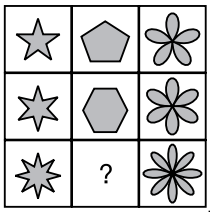
Marbles	(A)(A)(B)	(A)(B)(B)
Weight in grams	500	400

What is the average weight of marbles *A* and *B*?

A. 450 grams
B. 150 grams
C. 300 grams
D. 600 grams

---

9. Which is the missing figure?

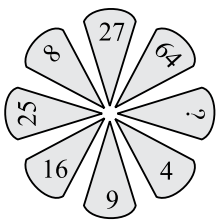


A. 
B. 
C. 
D. 

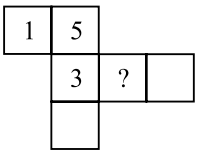
---

10. What is the missing number?

A. 36
B. 125
C. 343
D. 512



11. A cube has faces numbered 1, 2, 3, 4, 5 and 6. The numbers on the opposite faces of the cube add up to 7. The net of the cube is shown below. The numbers on 3 faces are not shown. Find the number on the face indicated by the '?'



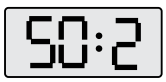
A. 6
B. 4
C. 2
D. 5

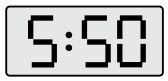
12. Select the correct mirror image of given below figure (X).

Fig. (X)

A. 

B. 

C. 

D. 

13. The clock shows 9 O' clock. What time will it show, if the hour hand makes a $\frac{3}{4}$ - turn in the anti-clockwise direction and minute hand do not change its position?

A. 12 : 15
B. 12 : 00
C. 3 : 00
D. 3 : 15

14. ☺ and ☹ are whole numbers and ☺ × ☹ = 48. What is the smallest possible value of ☺ + ☹ ?

A. 20
B. 12
C. 14
D. 16

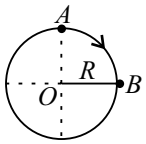
15. When two lines intersect each other at a common point, this common point is called the _____. But when three or more lines pass through a single common point, then this point is called the _____ of the lines.

A. Point of concurrency, same point
B. Unique point, point of concurrency
C. Point of intersection of the lines, point of concurrency
D. Point of intersection of the lines, point of collinearity

SCIENCE

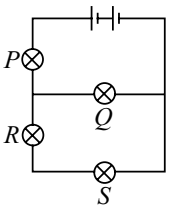
16. An object start moving in a circular path of radius R, from point A. The magnitude of displacement of the object, when it reaches point B is

A. πR
B. $\sqrt{2}R$
C. $\sqrt{2}\,\pi R$
D. $\frac{\pi R}{2}$



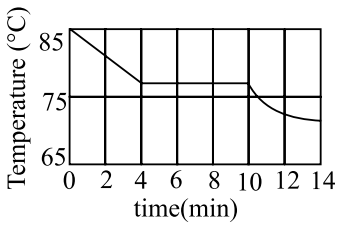
17. A battery lights up all the four lamps as shown in figure. When one of the lamp filament melts, the other three lamps stay on. Which of the following lamp filaments melt?

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



18. The hot liquid is poured into a test tube. The figure shows how the temperature of the contents of the test tube changes with time what is the physical state of the contents of the tube at time 8 minute?

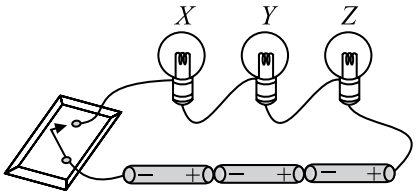
A. Mixture of liquid and vapour
B. Mixture of liquid and solid
C. Liquid
D. Solid



19. The images of clouds and trees in water are always less bright than in reality, it is because

A. Water is making the image dirty.
B. There is an optical illusion due to which the image appears to be less bright.
C. Only a portion of the incident light is reflected and quite a large portion goes mid water.
D. Air above the surface of water contains a lot of moisture.

20. Three bulbs *X*, *Y* and *Z* are connected in a circuit as shown in figure. When the switch is put on, then



A. All the bulbs will glow at the same time
B. Bulbs will glow in the order of *X*, *Y* and *Z*
C. Bulb *X* will glow first whereas bulbs *Y* and *Z* will glow simultaneously after some time
D. Bulb *Z* will glow first

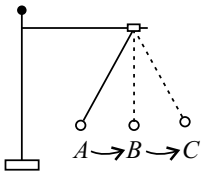
---

21. Following are the precautions one must take in the case a storm is accompanied by lightning. Which one of the following statements is not correct?
A. Do not take shelter under a tall tree.
B. Do not take shelter inside a closed car.
C. Do not take shelter under an umbrella.
D. Do not take shelter under an open garage.

---

22. A pendulum is oscillating as shown in the figure. If it takes 0.4 s to swing from *A* to *B*, then how long will it take to make 5 oscillations?

A. 1.6 s
B. 3.2 s
C. 8.0 s
D. 4.2 s



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23. Match the column I with column II.

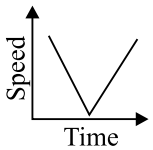
	Column I		Column II
(a)	Convex mirror	(i)	used as magnifying glass
(b)	Convex lens	(ii)	used as side view mirror in vehicles
(c)	Concave mirror	(iii)	image is erect and smaller than object
(d)	Concave lens	(iv)	used by dentists to see enlarged image

A. a-(i), b-(iii), c-(iv), d-(ii)
B. a-(iv), b-(ii), c-(iii), d-(i)
C. a-(ii), b-(i), c-(iv), d-(iii)
D. a-(iii), b-(iv), c-(ii), d-(i)

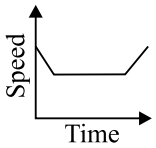
---

24. Which of the following speed-time graphs represents the case of a body first decelerating then moving with a constant speed and finally accelerating?

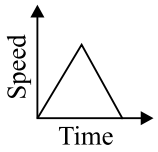
A.



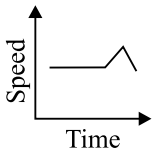
B.



C.



D.



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25. Ranjana was given three unknown solutions *P*, *Q* and *R*. She performed certain tests and observed the following:
Solution *P* → gives green colour with China rose indicator.
Solution *Q* → phenolphthalein remains colourless.
Solution *R* + sugar solution → turns methyl orange to yellow.
Identify the solutions *P*, *Q* and *R* respectively.
A. Orange juice, Salt solution, Baking soda
B. Soap solution, Lime water, Lemon juice
C. Soda water, Vinegar solution, Shampoo
D. Salt solution, Milk of magnesia, Antacid

---

26. Methods of separation depend on the nature of the constituents in a mixture. Study the methods of separation as given below.

	Types of mixture	Methods of separation
1.	Solid - Solid	Handpicking, Sieving
2.	Solid - Liquid (insoluble)	Sedimentation, Decantation, Filtration
3.	Liquid - Liquid (immiscible)	Decantation, Separating funnel
4.	Solid - Liquid (soluble)	Filtration, Decantation
5.	Liquid - Liquid (miscible)	Distillation

Which of these is incorrect method of separation?
A. 1 and 2
B. 5
C. 1 and 5
D. 4

---

27. Ankit, Sahil and Manish living in different parts of the country bought new bicycles on the same day. Ankit lives near sea coast. Sahil lives in a city with cool and moist climate whereas Manish lives near desert. After two years, whose bicycle will be in the worst condition due to rusting?
A. Ankit
B. Sahil
C. Manish
D. Ankit and Manish

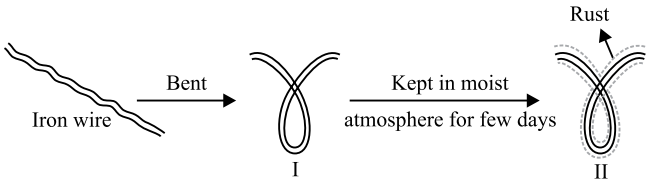
28. Rishab was performing an experiment with a blue coloured solution (X) in a beaker. By mistake a shaving blade fell into the beaker. After half an hour, he found that the colour of the solution in beaker changed to green (Y). What could be the solutions X and Y respectively?

A. Copper sulphate, Iron sulphate
B. Iron sulphate, Copper sulphate
C. Iron sulphate, Zinc sulphate
D. Copper sulphate, Zinc sulphate

29. Each cell in our body contains a/an _____ the DNA, which controls every feature of the body such as our looks, complexion, etc. Proteins that build part of our cells are made of _____. The fats in our body contain _____.

A. Neutral, bases, acids
B. Acid, amino acids, fatty acids
C. Base, nutrients, neutral substances
D. Amino acid, zinc carbonate, formic acid

30. Study the given figures carefully.



What type of changes occurred in the wire?

A. I is a chemical change while II is a physical change.
B. I is a physical change while II is a chemical change.
C. Both I and II are physical changes.
D. Both I and II are chemical changes.

31. Four students P, Q, R and S have to dissolve maximum amount of sugar in the same amount of water so as to win in a game.

P : Took hot boiling water.
Q : Took ice cold water.
R : Added more water on dissolving sugar in hot water.
S : Took ice cold water and added more water.

Whom do you think would win the game?

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

32. Consider the following four adaptations and select the ones required for animals to survive in tropical rain-forests.

(i) Living on the trees, development of strong tails.
(ii) Burrowing in soil to escape high temperature.
(iii) Sensitive hearing, sharp eyesight, thick skin, ability to camouflage.
(iv) Bask in Sun when temperature is low.

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

33. Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?

A. The lungs can be made fully empty by forcefully breathing out all air from them.
B. One can breathe out air through Eustachian tube by closing both nose and mouth.
C. One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.
D. One can breathe out air totally without oxygen.

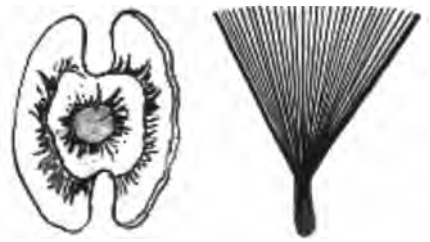
34. Root hairs are most important to a plant because they _____.

A. Anchor a plant to the soil
B. Provide a habitat for N_2 fixing bacteria
C. Increase the surface area for absorption
D. Contain xylem tissue.

35. When domestic sewage mixes with river water _____.

A. Small animals like rats will die after drinking river water.
B. The population of microbes increases and concentration of dissolved oxygen decreases.
C. The river water is still suitable for drinking as impurities are only about 0.1%.
D. The increased microbial activity releases micronutrients such as iron.

36. The given figures show two kinds of fruits :

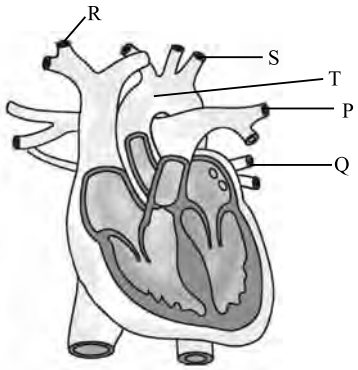


X Y

How are 'X' and 'Y' adapted for their dispersal in the surroundings?

	X	Y
A.	Fleshy and sweet	Hair-like structure to stick onto bodies of animals
B.	Able to float on water	Hook-like structure to stick onto fur of animals
C.	Air trapped within its structure	Dry seeds
D.	Wing-like structure	Hair-like structure to get blown off with the wind

37. In the given figure, which blood vessels represent pulmonary vein, pulmonary artery and vena cava respectively?



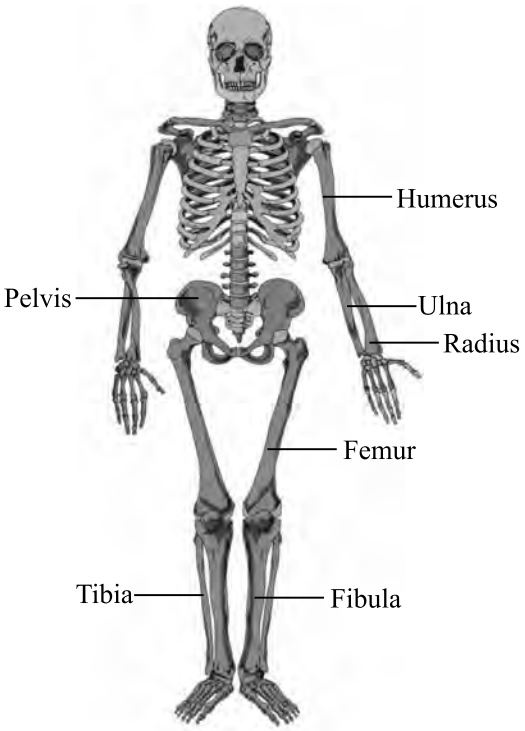
A. P, Q and R B. Q, P and R
C. P, Q and S D. Q, P and T

38. A group of social workers has transformed a dry area in the Rajasthan's Alwar district into a green place. They have revived dried-up rivers by constructing water-harvesting structures.
What are the names of those rivers?
A. Arveri and Ruparel
B. Sarsa and Bhagani
C. Arveri and Jahazwali
D. All of these

39. 

Which of the following are the functions of the part marked X?
P : It stores food for the developing embryo.
Q : It is called the 'poor man's protein'.
R : It can grow into new plant.
S : It absorbs water from the soil.
T : It holds the plant firmly in the ground.
A. P and R B. P, Q and R
C. P only D. S and T

40. Which of the following is an incorrect match?
A. Ginning – Separation of fibres from seeds
B. Recycling – Making useful things from waste
C. Stratosphere – It is the coldest layer of atmosphere
D. Refuse – The fourth 'R'

41. 

The given figure shows the skeleton of an adult human with some of its parts labelled. Identify the incorrectly labelled parts.
A. Femur and Pelvis B. Radius and Ulna
C. Tibia and Fibula
D. Radius and Humerus

42. Which of the following is an incorrect statement?
A. Cotton yarn shrinks away from flame and burns and smells like burning paper.
B. Silk has come under fire from animal right activists.
C. Wool fibres have an outer layer scales that reduce the ability of dirt and dust to penetrate the fibre.
D. A spinneret is used to make nylon but is not needed to make cotton or wool fibres.

43. Which of the following is classified correctly?

A. Banana : Fibrous root : Reticulate venation

B. Banyan : Tap root: Parallel venation

C. Rose : Tap root : Reticulate venation

D. Maize : Fibrous root : Reticulate venation

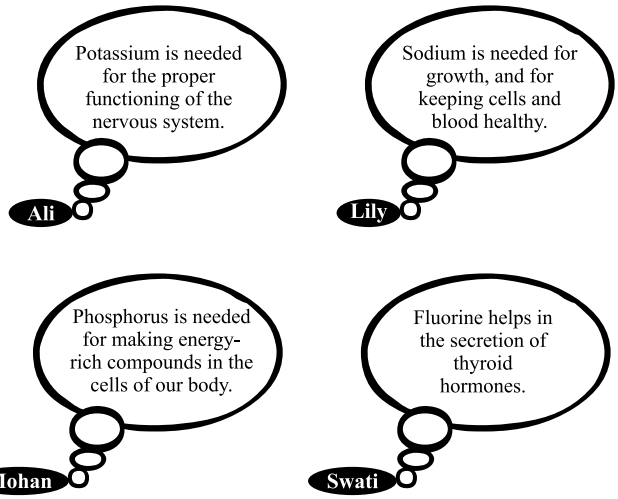
44. The given predator-prey relationships were observed among four living things P, Q, R and S.

P is eaten by S.
P feeds on R.
S feeds on R but not Q.
R gets its food from Q.

Which one of the following is the correct classification of the living things?

	Food producer	Prey	Prey/ Predator	Predator
A.	Q	S	R	P
B.	Q	R	P	S
C.	R	Q	S	P
D.	S	R	P	Q

45. Given below are statements about importance of minerals made by four students :



Which of the students have made incorrect statements?

A. Ali and Swati

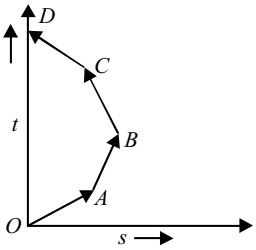
B. Ali and Lily

C. Ali, Lily and Swati

D. Mohan and Swati

ACHIEVERS SECTION

46. Which of the following options is correct for the object having a straight line motion represented by the graph shown in figure?



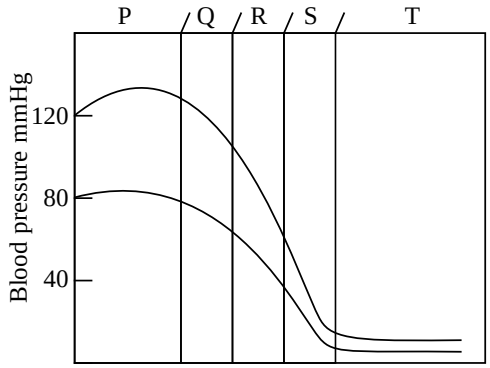
A. The object moves with constantly increasing velocity from *O* to *A* and then it moves with constant velocity.

B. Velocity of the object increases uniformly.

C. Average velocity is zero.

D. The graph shown is impossible.

47. The given graph represents the pressure (systolic and diastolic) of a volume of blood moving through circulatory system *via* different blood vessels labelled as P, Q, R, S and T.



Match the vessels given in Column-I with their corresponding letters given in Column-II and select the correct option.

	Column-I		Column -II
(a)	Venules	(i)	P
(b)	Capillaries	(ii)	T
(c)	Arterioles	(iii)	R
(d)	Veins	(iv)	Q
(e)	Arteries	(v)	S

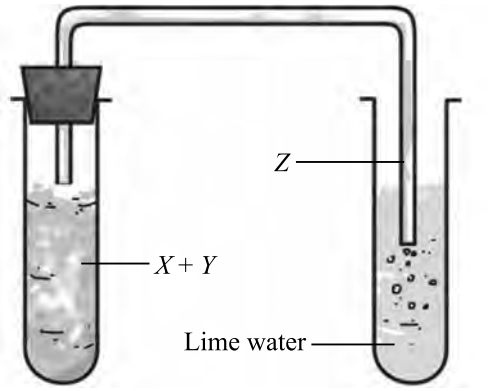
A. a-(i), b-(iv), c-(ii), d-(iii), e-(v)

B. a-(i), b-(iii), c-(v), d-(iv), e-(ii)

C. a-(v), b-(iii), c-(iv), d-(ii), e-(i)

D. a-(ii), b-(iii), c-(iv), d-(v), e-(i)

48. Study the given set up to pass gas *Z* through lime water.



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

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Direction (Q. 49 & 50) : Refer the given passage and answer the following questions.

Some organisms like fungi, etc. take in nutrients in solution form from dead and decaying matter, and are called saprotrophs. Fungi also grow on pickles, leather clothes and other articles that are left in hot and humid weather for long time. Certain fungi live in the roots of trees and share shelter and nutrients. This is called symbiotic relationship.

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

(i) Fungi are called saprotrophs because they grow on pickles, leather and clothes.
(ii) Saprotrophs lack chlorophyll, so cannot make food by photosynthesis.
(iii) Like some fungi, lichens also show symbiotic relationship.
(iv) The bacterium called *Rhizobium* shows symbiotic relationship as it provides shelter, water and minerals to legumes and, in return, the legumes provide food which they prepare by photosynthesis.

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

---

50. Which of the following organisms shows symbiotic relationship?

A. All fungi B. Lichens
C. *Rhizobium* D. Both B & C

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

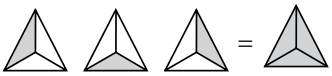
NSO

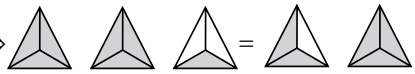
Set B

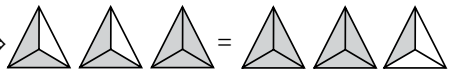
Year 2013

1. Select the correct match of shaded fraction.

A. $2\times\frac{2}{5}$ ⇒  =

B. $3\times\frac{1}{9}$ ⇒  =

C. $4\times\frac{2}{3}$ ⇒  =

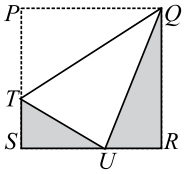
D. $7\times\frac{1}{3}$ ⇒  =

2. In the given question, which number will replace the question mark?

2	4	0
1	2	4
3	1	3
36	?	91

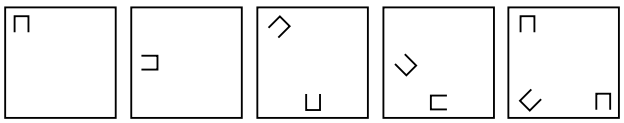
A. 25
B. 59
C. 48
D. 73

3. The figure shows a square *PQRS* being folded along *QT* such that point *P* touches *SR* at point *U*. Given that ∠*TQU* is 41°, find ∠*RQU*.

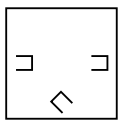
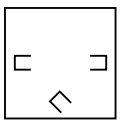
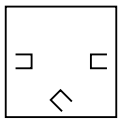
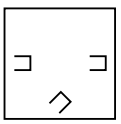


A. 8°
B. 7°
C. 9°
D. 11°

4. Find the figure from the options which will continue the series established by Problem figures.



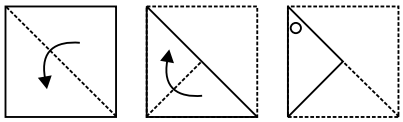
1 2 3 4 5

A. 
B. 
C. 
D. 

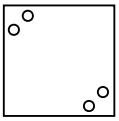
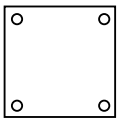
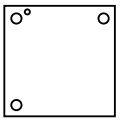
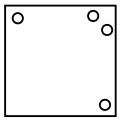
5. The ratio of the number of fiction books to non-fiction books to dictionaries was 2 : 5 : 4. After a librarian bought another 68 books of each type, the new ratio became 23 : 32 : 29. How many dictionaries were there at first?

A. 16
B. 14
C. 12
D. 48

6. A piece of sheet is folded and cut and then unfolded as shown in the figure. Select a figure which exactly resembles the unfolded paper.



1 2 3

A. 
B. 
C. 
D. 

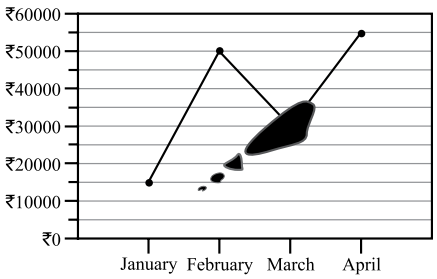
7. The average perimeter of a rectangle 42 cm × 74 cm and a square is 244 cm. What is the ratio of the area of rectangle to the area of square?

A. 677 : 1204
B. 677 : 1024
C. 777 : 1024
D. 777 : 1204

8. 0.63 of Mohit's money is equal to 1.5 times Tarun's money. If Mohit has ₹ 116 more than Tarun, how much money does Mohit have?

A. ₹ 200
B. ₹ 84
C. ₹ 190
D. ₹ 80

9. The line graph shows the profit made by a company from January to April. Some ink was spilled on the graph. What was the average amount of profit made by the company from January to March?



A. ₹ 20,667
B. ₹ 31,667
C. ₹ 30,667
D. ₹ 25,667

10. Sonu is taller than Sarthak. Amit is taller than Sonu. Sahil is taller than Amit. Samir is the tallest. If they are arranged according to their heights, who will be in the middle?

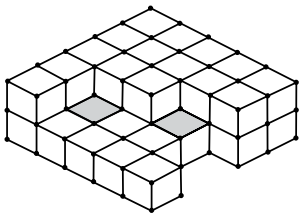
A. Sonu
B. Sahil
C. Sarthak
D. Amit

11. If □ = $\frac{1}{2}$ and □ = $\frac{1}{4}$, which one of the following has the greatest value?

A. □ + □
B. □ ÷ □
C. □ × □
D. □ – □

12. Count the number of cubes in the given figure?

A. 37
B. 39
C. 38
D. 35

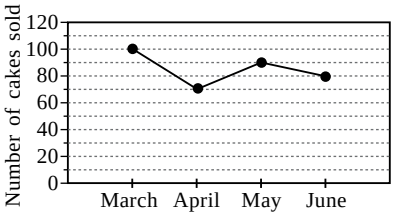


13. If $\frac{1}{6.198}$ = 0.16134, then the value of $\frac{1}{0.0006198}$ is

A. 0.016134
B. 0.16134
C. 1613.4
D. 16134

14. The line graph shows the number of cakes Zarrin sold from March to June. If Zarrin earned ₹ 12 for every cake sold, then how much did she earn from March to June?

A. ₹ 340
B. ₹ 360
C. ₹ 4080
D. ₹ 4800

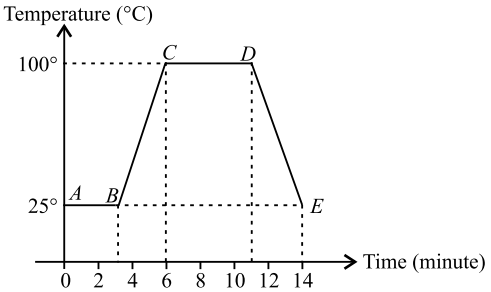


15. Number of factors of the product of the highest common factor of 18 and 24 and the eighth multiple of 6 is

A. 18
B. 288
C. 22
D. 16

SCIENCE

16. The temperature changes in a closed kettle of water was recorded for 14 minutes and represented in the graph below. Which of the following statement is true?



A. The kettle of water was heated for 6 minutes.
B. There was less water in the kettle at point *E* than at point *A*.
C. The water took 6 minutes to reach its boiling point after it was heated.
D. The water in the kettle started boiling at *C*.

17. Marking on a bulb is 60 W, 220 V. What does it signify?

A. The bulb is connected across the 220 volts, 60 joules of energy is consumed for every second.
B. The bulb is connected across 60 joules, 220 volts of energy is consumed.
C. 60 unit of current will flow in the bulb.
D. 220 unit of current will flow in the bulb.

18. Human eye has a converging lens system that produces an image at the back of the eye. If the eye views a distant object, which type of image is produced?

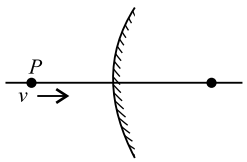
A. Real, erect, same size
B. Real, inverted, diminished
C. Virtual, erect, diminished
D. Virtual, inverted, magnified

19. An electric kettle is plugged in and switched on. The fuse in the plug blows immediately. Which single fault could cause this ?

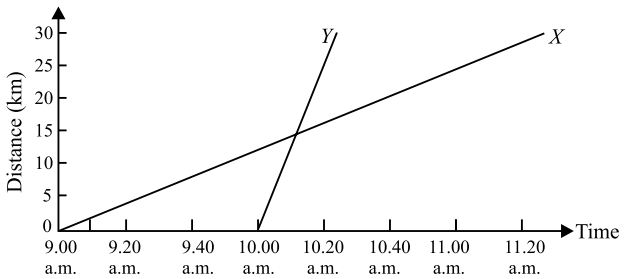
A. The earth wire is not connected to the kettle.
B. The line wire and neutral wire connections in the plug are swapped around.
C. The line wire touches the metal case of the kettle.
D. The wires connected to the plug are too thin.

20. A point object P moves towards a convex mirror with a constant speed v, along its optic axis. The speed of the image

A. Is always less than v
B. Is always more than v
C. Is equal to v
D. Decreases as P comes closer to the mirror.



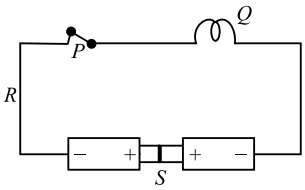
21. Two friends X and Y started from the same location and went 30 km along a road in the same direction as shown in graph. Which among the following statement is correct?



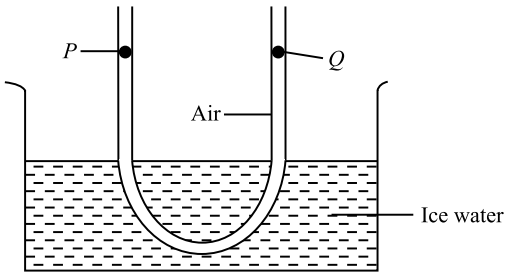
A. Both are moving with same speed.
B. Y moves with non uniform speed.
C. X completes his journey early.
D. Y overtakes X at 10:10 a.m.

22. The bulb in the circuit given here does not glow. Which labelled part is responsible for this ?

A. P and S
B. P only
C. R only
D. S only



23. A U tube is immersed in ice water as shown in the figure. What will you observe after sometime ?



A. P and Q will move downwards.
B. P and Q will move upwards.
C. P will move upwards and Q will move downwards.
D. P will move downwards and Q will move upwards.

24. Which of the following statement (s) is/are true?

(I) We can find east-west direction with the help of a magnet.
(II) Copper is a magnetic material.
(III) A cylindrical magnet has only one pole, either north or south pole.

A. Only I
B. Both (I) and (II)
C. Only (III)
D. Both (I) and (III)

25. Mr. Kumar forgot a water bottle in his car parked out on a sunny day. On the next day, when he came back and took the bottle out, he observed some water droplets on the inner surface of the empty portion of the bottle.
These droplets of water were formed due to

A. Saturation and evaporation
B. Boiling and condensation
C. Evaporation and condensation
D. Condensation and saturation

26. The rocks underneath the lake located close to Rahul's house are made of limestone. Which of the following are correct about the lake's water after an acid rain?

1. It turns red litmus to blue.
2. Neutralisation reaction occurs.
3. Phenolphthalein remains colourless

A. 1 and 2
B. 1 and 3
C. 2 and 3
D. 1, 2 and 3

27. Read the given statements and select the correct option.
Statement 1 : The ash produced from burning a magnesium ribbon is dissolved in water to get a basic solution.
Statement 2 : It is a physical change as the substance formed is also composed of same elements Mg, H and O.

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 and statement 2 is false.
D. Both statements 1 and 2 are false.

28. During a group discussion on the topic "Rusting", three students, Naina, Rohit and Mehak gave the following statements:
Naina : Stainless steel rusts more quickly as it contains carbon and metals like chromium, nickel and manganese.
Rohit : Salty water slows the process of rust formation as it contains many salts.
Mehak : Depositing a layer of iron on zinc is called galvanisation.
Choose the correct option.
A. Rohit and Mehak are correct.
B. Naina and Rohit are correct.
C. Naina is correct while Rohit and Mehak are wrong.
D. All the three are wrong.

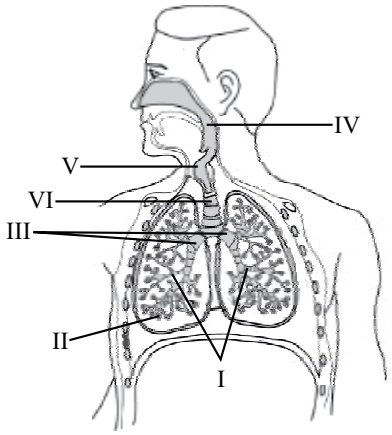
29. I can form a separate layer on water. You use me for making paper translucent. Who am I?
A. Lemon juice
B. Honey
C. Mustard oil
D. Sugar solution

30. Some bags of cement were lying in the open playground of Raghu's school for the construction purpose. Due to rain at night, all the bags got wet. If the sun shines brightly on next day, then what type of change will Raghu observe in the cement?
A. Seasonal change
B. Reversible change
C. Irreversible change
D. Periodic change

31. Rima prepared an indicator paper by dipping a paper strip in a solution of *X*. She put a few drops of an unknown solution *Y* which contains H^+ ions less than OH^- ions on this paper. She observed that the colour of paper changed to yellow. What do you think was solution *X*?
A. Red litmus solution
B. Phenolphthalein
C. Methyl orange
D. Turmeric solution

32. Which one of the following is an incorrect statement?
A. Pulmonary artery carries oxygenated blood from the lungs to the heart.
B. Ozone present in the troposphere is harmful to animals.
C. The seeped water collects between layers of hard rocks, this is called an aquifer.
D. Eutrophication is a natural phenomenon in freshwater bodies.

33. Given below is the diagrammatic sectional view of the human respiratory system. Which set of three parts out of I-VI have been correctly identified?



A. (I) Bronchioles, (IV) Pharynx, (VI) Bronchus
B. (III) Bronchi, (IV) Pharynx, (VI) Trachea
C. (I) Bronchioles, (II) Alveolus, (VI) Bronchus
D. (II) Alveolus, (IV) Larynx, (V) Glottis

34. Which of the following is not the correct example of structural adaptation in animals?
A. A desert fox losing excess heat through its large ear.
B. A monkey using its strong, long limbs and tail for grasping branches.
C. A polar bear balancing itself on its paws with stiff hair.
D. Toucan has developed sticky pads on its feet to help it to reach the fruits on branches which are otherwise too weak to support its weight.

35. A rare plant in a botanical garden has been infected with specific fungi that feed on sugar molecules. After careful examination, a botanist suggested the following surgical intervention : removing the infected portion *i.e.*, a ring of bark about 2 inches in height and about 2 cms wide. This will remove the cambial cells, phloem, endodermis, cortex and epidermis of the stem. Which of the following will be the consequence of such a surgical intervention?
A. Flow of food downwards will be affected but flow of water upwards will be maintained.
B. Flow of water upwards will be affected but flow of food will be maintained.
C. Both the flow of food and water will be affected.
D. Neither the flow of food nor the water movement will be affected.

36. Silk obtained from silkworm is a product of ____.
A. Skin of caterpillar
B. Salivary glands of silk moth
C. Salivary glands of caterpillar
D. Skin of silk moth

37. Which of the following statements is incorrect?
A. Soil helps forests to grow and regenerate.
B. Forests protect the soil from erosion.
C. Forests influence the climate and water cycle.
D. Plants and animals in forest are not dependent on each another.

38. Study the given diagrams showing the cross-section of two flowers. Which of the following statements is/are correct regarding them?

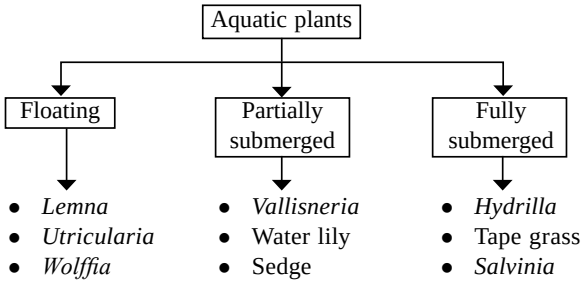
Flower X **Flower Y**

(i) The flowering plants have developed from seeds.
(ii) Flower X is a female flower and flower Y is a bisexual flower.
(iii) Fertilization can take place in both flowers.
A. (i) only
B. (ii) only
C. (i) and (iii)
D. (ii) and (iii)

39. The clean and selected wool fibres are passed through rollers, which straightens the fibres and removes the unwanted matter. This process is called as ____.
A. Shearing
B. Scouring
C. Carding
D. Spinning.

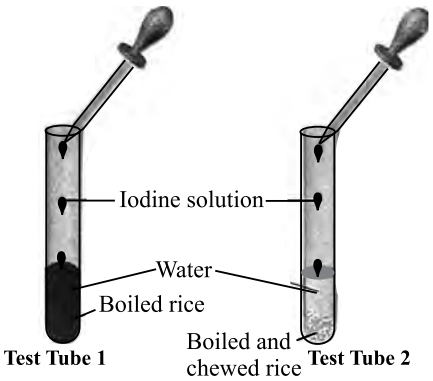
40. Read the given statements and select the correct option.
Statement 1 : Climate is the current condition or the state of atmosphere of a particular place in terms of humidity, cloudiness, temperature, wind, etc.
Statement 2 : Weather refers to the long term (usually 25-30 years) average environmental conditions of a particular place.
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 and statement 2 is false.
D. Both statements 1 and 2 are false.

41. Refer the given flow chart.



Which of the following plants are incorrectly classified?
A. *Utricularia*, *Vallisneria*, *Salvinia*
B. *Lemna*, *Vallisneria*, *Salvinia*
C. *Wolffia*, Water lily, Tape grass
D. *Utricularia*, Water lily, Tape grass

42. Ridhima took two test tubes labelled as 1 and 2 as shown in the figure. In test tube 1, she put one table spoon of boiled rice and in test tube 2, she put one table spoon of boiled rice after chewing it for 3-5 minutes. Then she added 3-4 mL of water in both the test tubes. Thereafter, she poured 2-3 drops of iodine solution in each of the test tubes.



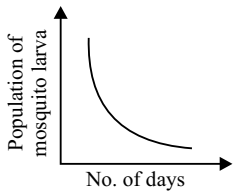
Which of the following would be the expected observation by Ridhima?
A. Colour changes to blue-black in test tube 1 as rice is rich in starch.
B. Colour changes to blue-black in test tube 2 as saliva breaks down the starch into sugars.
C. Colour changes to blue-black in both the test tubes.
D. Colour does not change in either of the test tubes.

43. Which one of the following pairs is correctly matched?
A. Tibia and Fibula – Both form part of knee joint
B. Crabs and Cockroaches – Possess exoskeleton
C. Shoulder joint and Elbow joint – Ball and socket type of joint
D. Vitamin D – Helps in blood clotting

44. Rehan saw a dead rat in his garden. He also spotted some earthworms and millipedes near the rotten rat. Rehan went to school and told his teacher that earthworms and millipedes are decomposers. His teacher told him that he is not correct because _____.

A. Earthworms and millipedes break down the dead rat into simpler substances
B. Earthworms and millipedes break down the dead rat into smaller pieces for easy digestion
C. Earthworms and millipedes break down the dead rat into simpler substances and return it to the soil as nutrients
D. Earthworms and millipedes break down the dead rat into smaller pieces to speed up the process of decomposition.

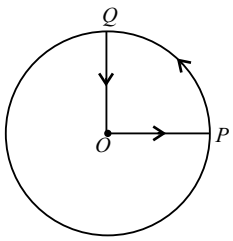
45. Which of the following is likely the reason for the shown change in the population of mosquito larva in a pond?



A. Occurrence of oil spill over the pond
B. Fish are introduced into the pond
C. Most of the mosquito larvae have changed into mosquitoes
D. All of these

ACHIEVERS SECTION

46. A cyclist starts from the centre O of a circular park of radius 1 km, reaches the edge P of the park, then cycles along the circumference and returns to the centre along QO as shown in figure. If the round trip takes 10 minutes, then the average speed of cyclist is



A. $\frac{\pi+4}{10}$ km per minute
B. $\frac{\pi+4}{20}$ km per minute
C. $\frac{\pi}{4}$ km per minute
D. π km per minute

47. Fill in the blanks by choosing the correct option.

Vinegar + Baking soda [P] → [Q] + Other substances

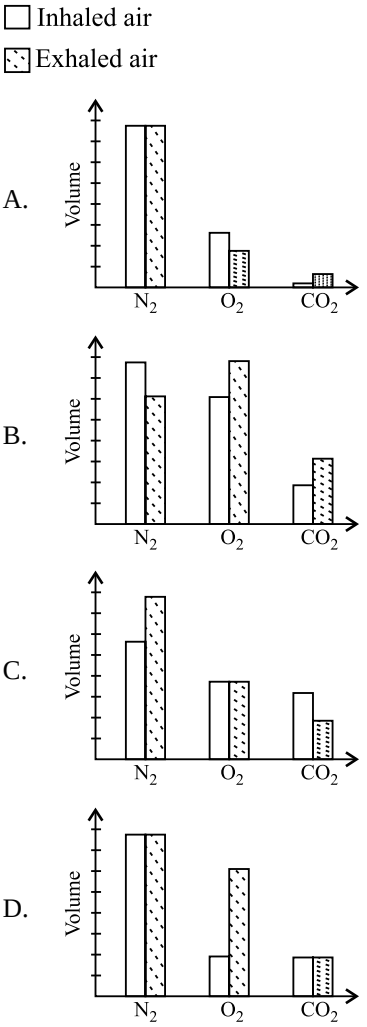
Vinegar → Turns China rose to [X]

Baking soda → Turns phenolphthalein to [Y]

[Q] + $Ca(OH)_2$ → [R] + H_2O

	P	Q	R	X	Y
A.	Sodium hydrogen carbonate	CO_2	$CaCO_3$	Red	Pink
B.	Lime water	H_2	CaO	Colourless	Green
C.	Sodium hydrogen carbonate	H_2	CaO	Pink	Red
D.	Magnesium hydroxide	CO_2	$CaCO_3$	Colourless	Green

48. Which one of the following bar charts best represents the composition of nitrogen (N_2), oxygen (O_2) and carbon dioxide (CO_2) in inhaled and exhaled air during breathing in human beings?



DIRECTION (Q. 49 & 50) : Refer the given passage and answer the following questions.
A farmer is growing crop regularly in his field. He uses chemical fertilizers, pesticides, organic manures as well as biofertilizers. There is a huge lake nearby to his field and a factory which emits smoke as a by product.

49. A considerable increase in water pollution was noticed as the farming activity intensified. The most likely reason for this could be _____.
    A. Chemical fertilizers leached into the lake from the field
    B. Living organisms used in biofertilizers polluted the lake
    C. Organic manure leached into the lake from the field
    D. Smoke particles from the industry got settled in moist surroundings of the lake

50. An expert agriculturist suggested the farmer to minimize the use of chemical fertilizers and instead use biofertilizers as they have many advantages over chemical fertilizers. Which of the following is not true regarding biofertilizers?
    A. They are economical.
    B. They will least pollute lake.
    C. They are renewable.
    D. They require large set-up for their production.

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

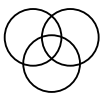
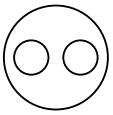
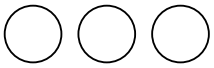
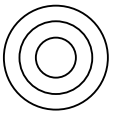
Set A

Year 2014

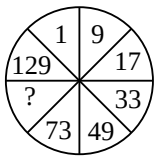
1. Four friends M, N, O and P are playing cards. If P faces towards North and M faces towards West, then who faces towards South?
   A. O
   B. N
   C. P
   D. Data inadequate

2. Pointing towards a man, Radhika said, "His sister is my daughter's brother's mother." How is the man related to Radhika?
   A. Brother
   B. Father
   C. Uncle
   D. Grandfather

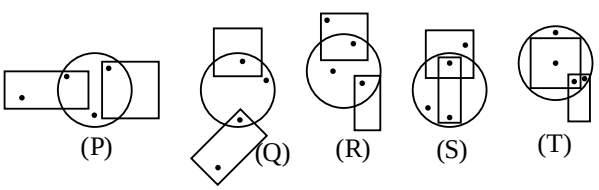
3. Select the option which will replace the question mark in the given number series.
   198, 194, 185, 169, ?
   A. 92
   B. 112
   C. 136
   D. 144

4. Which of the following Venn diagrams represents the best relationship amongst "Men, Trees and Living beings"?
   A. 
   B. 
   C. 
   D. 

5. Which of the following numbers will complete the given figure?
   A. 90
   B. 97
   C. 107
   D. 117



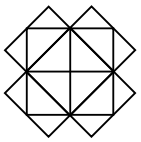
6. Select a pair of figures from the options which has same condition of placement of dots.



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

7. If the digits of a watch are replaced by every alternate letter in alphabets starting from 12, in the reverse order, i.e. 12 is replaced by A, 11 is replaced by C and so on, then at which letter would be the hour hand when it is 5:00 pm?
   A. P
   B. N
   C. O
   D. Q

8. Count the number of rectangles in the given figure.
   A. 20
   B. 18
   C. 16
   D. 14



9. Find the mirror image of the given Figure (X), if the mirror is placed vertically to the left.

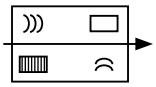
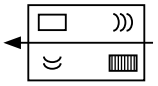
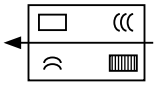
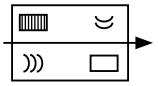
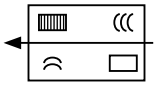


Figure (X)

   A. 
   B. 
   C. 
   D. 

10. Arrange the given units in a meaningful sequence.
    1. Hecto 2. Centi 3. Deca 4. Kilo 5. Deci
    A. 1, 3, 4, 5, 2
    B. 1, 5, 3, 4, 2
    C. 2, 5, 3, 1, 4
    D. 5, 2, 1, 4, 3

11. Two positions of a dice are given below. Find the number at the bottom, when number 6 is at the top.

    A. 1
    B. 4
    C. 5
    D. Can't be determined

12. 121 is related to 12 in the same way as 25 is related to _____.
A. 1
B. 2
C. 6
D. 7

13. A bird shooter was asked how many birds he had in his bag. He replied that there were all sparrows but six, all pigeons but six, and all ducks but six. How many birds did he have in all in his bag?
A. 9
B. 18
C. 27
D. 36

14. Which of the following is exactly in the middle of the 17th from the right end, and 18th from the left end, in the given arrangement?

3 D 6 $ C 4 E 8 # N 5 F 1 A P ★9 M @ K 2 B % 7 H U
A. A
B. 1
C. F
D. %

15. Which of the following options will complete the pattern in Figure (X)?

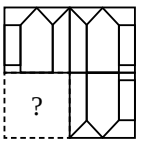
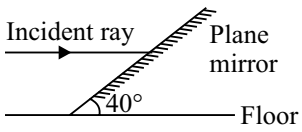


Figure (X)

A. 
B. 
C. 
D. 

SCIENCE

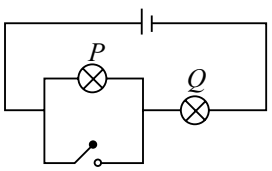
16. A ray of light parallel to the floor strikes a plane mirror, which is inclined at an angle 40° as shown in figure. What is the angle of reflection?
A. 40°
B. 80°
C. 50°
D. 90°



17. When you heat a system, its temperature _____.
A. Always increases
B. Sometimes decreases
C. May stay the same
D. Always goes up or down, depending on the heat

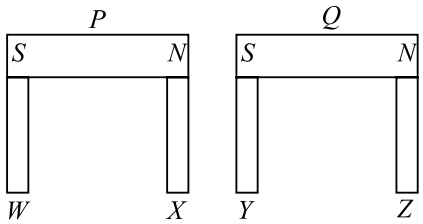
18. Two boys, *P* and *Q* are running along the same path. *P* is 10 m ahead of *Q* initially. However, *Q* catches up with *P*, after running 50 m. Assuming that both boys are running at a constant speed, what is the ratio of the speeds of *P* and *Q*?
A. 6 : 5
B. 5 : 6
C. 4 : 1
D. 4 : 5

19. The given figure shows a circuit which contains two identical lamps. When the switch is closed, which 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. *P* and *Q* both will not light up.

20. Two magnets, *P* and *Q* attract four soft iron bars, *W*, *X*, *Y* and *Z* at their poles, as shown in the given figure. What will happen to the iron bars, when the two magnets move towards each other, and attract each other?



A. Nothing will happen.
B. *X* and *Y* will drop off.
C. *X* and *Y* will repel away each other.
D. *W* and *Z* will attract *X* and *Y* respectively.

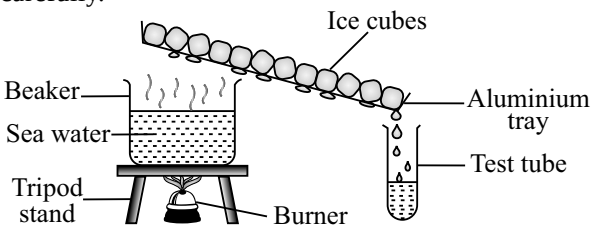
21. A laboratory thermometer gave the reading of –1°C and 99°C when inserted into melting ice and boiling water respectively, both at standard atmospheric pressure. What is the error when the same thermometer is used to measure the difference between two arbitrary temperatures?
A. –1°C
B. 1°C
C. 0°C
D. 2°C

22. Metal pots are often made shiny on surface outside especially on the top and side and that makes sense thermally because this _____.
A. Conducts heat better
B. Radiates less energy out from the pot
C. Lowers the loss due to conduction
D. Appreciably decreases convection losses

23. Komal and Kavita start at one end of a street (the origin), run to the other end, and then head back. On the way back, Komal is ahead of Kavita. Which of the given statements is correct, regarding the distance covered and the displacement from the origin at the moment?
A. Kavita has run a greater distance, but her displacement is less than that of Komal.
B. Kavita has run a greater distance and her displacement is greater than that of Komal.
C. Komal has run a greater distance, but her displacement is less than that of Kavita.
D. Komal has run a greater distance and her displacement is greater than that of Kavita.

24. During the formation of rain, when water vapours change back to liquid in the form of rain drops, _____.
A. Heat is absorbed
B. Heat is released
C. Heat is first absorbed, and then released
D. There is no exchange of heat

25. Observe the following experimental set-up carefully.

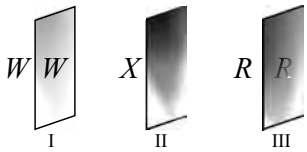


Identify liquid (*X*) in the test tube, residue (*Y*) left in the beaker, process (*Z*) involved.

	X	*Y*	*Z*
A.	Sea water	Sugar	Sedimentation and decantation
B.	Water	Salt	Evaporation and filtration
C.	Sea water	Salt	Condensation and evaporation
D.	Water	Salt	Evaporation and condensation

26. Read the given statements and select the correct option.
Statement 1: Acid rain causes damage to buildings, historical monuments, plants and animals.
Statement 2: Air pollutants such as carbon dioxide, sulphur dioxide and nitrogen dioxide dissolve in rain drops to form carbonic acid, sulphuric acid and nitric acid respectively.
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 and statement 2 is false.
D. Both statements 1 and 2 are false.

27. Reyansh placed three different types of glasses in front of letters as shown below :



Which of the following observations is correct?
A. Glass I is transparent and unclear.
B. Glass I is translucent and clear.
C. Glass II is opaque and frosted.
D. Glass III is translucent and frosted.

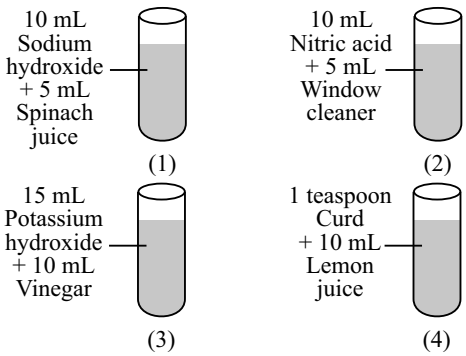
28. Preeti has collected some items from her kitchen :

i.	*Amla*	ii.	Baking soda
iii.	Tamarind	iv.	Soap
v.	Lime water	vi.	Common salt
vii.	Sugar		

She classified them as acidic, basic and neutral substances. Which of the following classification is correct?

	Acidic	**Basic**	**Neutral**
A.	(i), (ii)	(iv), (vii)	(iii), (v), (vi)
B.	(iv), (vi)	(i), (ii), (iii)	(v), (vii)
C.	(i), (iii)	(ii), (v), (vi)	(iv), (vii)
D.	(i), (iii)	(ii), (iv), (v)	(vi), (vii)

29. A science teacher arranged the following sets of test tubes and added different indicators to the solutions.

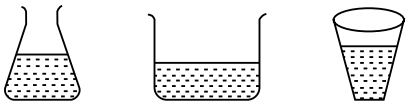


She asked the students to find out the incorrect result from the following.
A. Test tubes 1 and 3 turn turmeric solution to red.
B. Test tubes 2 and 4 turn China rose indicator to green.
C. Methyl orange turns yellow in test tubes 1 and 3.
D. Phenolphthalein remains colourless in test tubes 2 and 4.

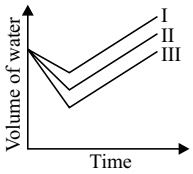
30. Some examples of changes are given below :
a. Cutting a log of wood into pieces.
b. Breaking down of ozone.
c. Melting of glaciers.
d. Lime water turns milky.
e. Digestion of food.
f. Punching a hole in a paper.
Classify the above changes into
I. Irreversible physical change
II. Chemical change
III. Reversible physical change

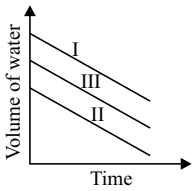
A.	I - a, f	II - b, d, e	III - c
B.	I - a, b, e	II - d, f	III - c
C.	I - a	II - b, d	III - c, e, f
D.	I - f	II - c, e	III - a, b, d

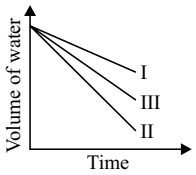
31. 50 mL of water at 25°C was poured into each of the three containers as shown in the given figure. The containers were then left in a closed room.

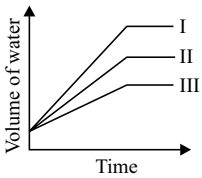


Which of the following graphs correctly shows the volume of water in each container after five hours?

A. 

B. 

C. 

D. 

32. Which of the following statements is/are true (T) or false (F) regarding nutrition in organisms?
(i) Photosynthesis also occurs in leaves having colour other than green.
(ii) The process of photosynthesis first produces a simple carbohydrate called glucose which then gets converted into a complex carbohydrate called starch.
(iii) *Cuscuta* is a yellow-coloured plant but it can synthesize its own food by photosynthesis.
(iv) In a symbiotic association, *Rhizobium* bacteria derive their nutrition from fungus.

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

33. Read the given passage.
The water-bearing layer of the earth called __*P*__ is made up of two components __*Q*__ and __*R*__. The top level of layer __*P*__ is called __*S*__. When too many tubewells are used in an area, the level of __*S*__ in that area goes down.
Select the correct sequence of words to fill up the blanks in the above passage.

	P	*Q*	*R*	*S*
A.	Sea	Permeable rocks	Soil	Aquifer
B.	Water table	Soil	Permeable rocks	Aquifer
C.	Lake	Permeable rocks	Soil	Water table
D.	Aquifer	Soil	Permeable rocks	Water table

Direction : Read the given passage carefully and answer Q. No. 34 and 35.
The phenomenon in which a bird or other animal moves from one place to another in one season, and returns again in a different season is called migration. It is an adaptation to escape the harsh conditions of their normal habitat so as to survive.

34. The __(i)__ flies from its native place in Russia to places like __(ii)__ in Rajasthan and __(iii)__ in Haryana during a particular season. It stays in India for a few months and then goes back in __(iv)__ season. The general name given to birds like these is __(v)__ birds.
Select the correct sequence of words to fill up the blanks in the above passage.

	(i)	(ii)	(iii)	(iv)	(v)
A.	Toucan	Sultanpur	Bharatpur	Autumn	Adaptatory
B.	Siberian crane	Bharatpur	Sultanpur	Winter	Migratory
C.	Arctic tern	Bharatpur	Sultanpur	Spring	Migratory
D.	Siberian crane	Sultanpur	Bharatpur	Summer	Adaptatory

35. Which of the following is the probable method these migratory birds use to travel to the same place year after year?
A. They have built-in sense of direction and probably use land-marks to guide themselves.
B. They are guided by the position of the sun during the day and by the position of stars at night.
C. They use the magnetic field of earth to find the direction so as to reach the same place.
D. All of these

36. A teacher showed the following plants to students and asked them to write their methods of reproduction.

W *X* *Y* *Z*

Given below are answers written by the students :

Student *P* : *W*, *X* and *Y* propagate vegetatively through stem.

Student *Q* : *W* and *X* are rhizomes which propagate vegetatively through roots.

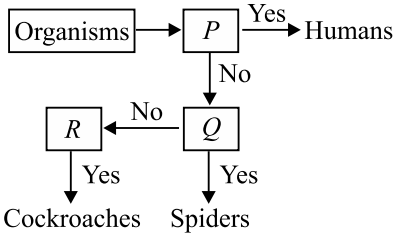
Student *R* : *Z* is called bulbil which propagates vegetatively through stem.

Student *S* : *Y* vegetatively propagates through roots.

Which student(s) wrote the correct answer?

A. Students *P* and *S*
B. Only Student *S*
C. Students *Q* and *R*
D. Only Student *Q*

37. Refer to the given flow chart showing the characteristics *P*, *Q* and *R* which are present in some animals and absent in others.



Identify *P*, *Q*, *R* and select the correct option.

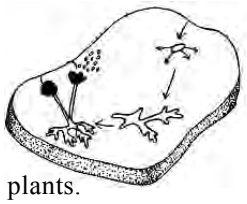
	P	*Q*	*R*
A.	Diaphragm	Book lungs	Operculum
B.	Throat	Spiracles	Book lungs
C.	Lungs	Book lungs	Spiracles
D.	Diaphragm	Operculum	Spiracles

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

	Column - I	Column - II
(a)	Clothing material	(i) Nylon
(b)	Twisted fibre	(ii) Fabric
(c)	Synthetic fibre	(iii) Yarn
(d)	Animal fibre	(iv) Cotton
(e)	Plant fibre	(v) Silk

A. (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv), (e) - (v)
B. (a) - (ii), (b) - (iii), (c) - (v), (d) - (i), (e) - (iv)
C. (a) - (ii), (b) - (iii), (c) - (i), (d) - (v), (e) - (iv)
D. (a) - (i), (b) - (iv), (c) - (iii), (d) - (ii), (e) - (v)

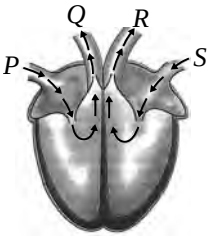
39. Which of the following statements best describe the organism growing on the given piece of bread?



(i) It belongs to flowering plants.
(ii) It reproduces by spores.
(iii) It is a chlorophyllous organism.
(iv) It prepares its own food.
(v) It obtains food from dead and decaying organic matter.

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

40. The given diagram shows blood circulation pathway in the heart. Which of the following correctly shows the relative amount of oxygen and carbon dioxide at *P*, *Q*, *R* and *S*?



	More CO_2	More O_2
A.	*R*	*P*, *Q*, *S*
B.	*Q* and *R*	*P* and *S*
C.	*S*	*R*
D	*P* and *Q*	*R* and *S*

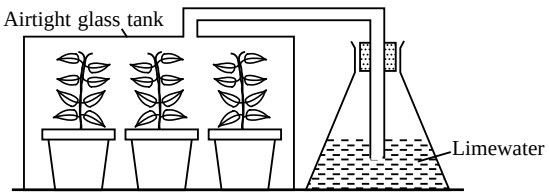
41. Which of the following statements are correct regarding the given animals?

X *Y*

(i) Both *X* and *Y* possess streamlined body and webbed feet.
(ii) Both are good swimmers.
(iii) *Y* has a thick layer of fat under its skin with fur on its body, while *X* has thick skin and a layer of fat under its skin.
(iv) Both live together in large numbers and huddle together to keep themselves warm.
(v) *Y* has very strong sense of smell unlike *X*.

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

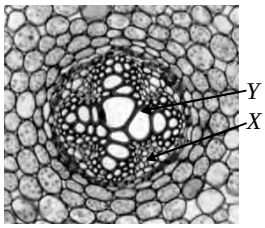
42. Jayesh placed 3 potted plants in an airtight glass tank as shown in the given diagram.

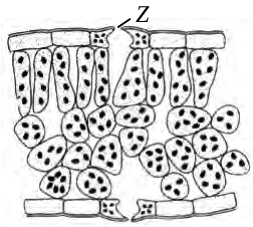


If he placed the set-up in a dark cupboard for a few hours, what would happen to the limewater, after a few hours?

A. It would turn dark blue.
B. There would be slightly less limewater left.
C. It would turn milky.
D. There would be no change.

43. Refer to the given figures and answer the question that follows.





What are the main functions of *X*, *Y* and *Z*?

	X	***Y***	***Z***
A.	Supports the plant	Transports food	Gaseous exchange
B.	Transports water and minerals	Transports food	Release water vapour
C.	Transports water and minerals	Supports the plant	Take in CO_2
D.	Transports food	Transports water and minerals	Gaseous exchange

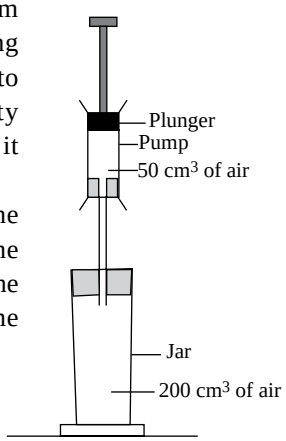
44. Given below are the four food components (*P*-*S*) and their corresponding sources.

P – meat, fish, eggs
Q – butter, ghee, margarine
R – bread, biscuits, potatoes
S – amla, tomato, orange

Select the incorrect statement regarding them.

A. Deficiency of *P* causes Marasmus in children and Kwashiorkor only in adults.
B. Amongst *P*, *Q*, *R* and *S*, 1 gram of *Q* produces the maximum energy.
C. Excess of *R* gets stored in body cells, and is used for production of energy, whenever required.
D. Deficiency of *S* leads to a disease, in which gums swell up and bleed.

45. Study the given diagram carefully. A pump containing 50 cm^3 of air is connected to the glass jar. The capacity of the jar is 200 cm^3 and it contains 200 cm^3 of air.
The plunger is pushed all the way into the pump and all the air from the pump goes into the jar. What will be the volume of air in the jar now?



A. 250 cm^3
B. 200 cm^3
C. 50 cm^3
D. Cannot be calculated

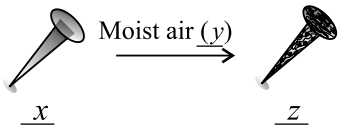
ACHIEVERS SECTION

46. A fish sees the face of a scuba diver through a thin bubble, as shown in figure. Compared to the face of the diver, the image seen by the fish will be _____.

Diver Bubble Fish

A. Smaller and erect
B. Smaller and inverted
C. Larger and erect
D. Cannot predict

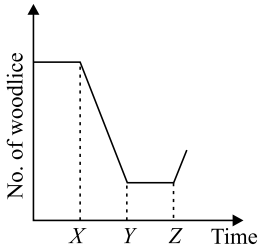
47. Fill in the blanks by observing the following chemical process.



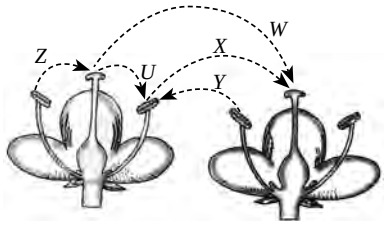
The above process becomes faster when humidity is __a__ and can be prevented by applying a coat of __b__, or by depositing a layer of a metal like __c__ on iron.

	x	*y*	*z*	*a*	*b*	*c*
A.	Mg	O_2	MgO	low	water	copper
B.	Ca	CO_2	$CaCO_3$	high	oil	magnesium
C.	Fe	O_2 & H_2O	Fe_2O_3	high	grease	chromium
D.	Fe	H_2O & O_2	FeO	low	paint	zinc

48. A leaf litter community has woodlice as primary consumers and centipedes and millipedes as secondary consumers. The given graph shows the changes in the population of woodlice over a period of time. Which of the following is the incorrect possibility, as per given graph?



A. The number of centipedes in the habitat increases at point *X*.
B. There is an increase in the quantity of dead leaves in the habitat at point *Z*.
C. The number of millipedes in the habitat decreases at point *X*.
D. There is a shortage in the quantity of dead leaves in the habitat at point *X*.

49. 

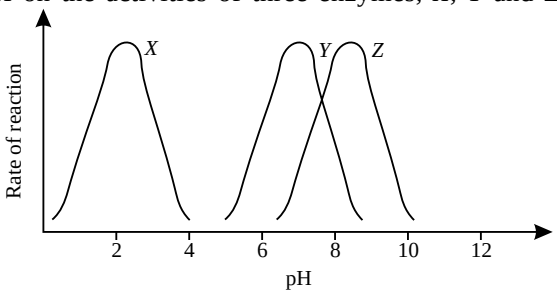
The given figure shows the longitudinal section of two flowers of the same type. Study the following statements with reference to the given figure.

(i) *Z* and *U* show self pollination, whereas *Y* shows cross pollination.
(ii) *W*, *X* and *Z* show transfer of pollen grains that will result in fruit formation.
(iii) *Z* shows self pollination, while *X* shows cross pollination.
(iv) *X* and *Z* show pollination that will result in fruit formation.
(v) *W*, *X* and *Y* show cross pollination.

Which of the given statements are true or false?

A. (i) and (iv) are true; (ii), (iii) and (v) are false.
B. Only (v) is true; rest are false.
C. (i), (ii), (iii) and (v) are true; (iv) alone is false.
D. (i), (ii) and (v) are false; (iii) and (iv) are true.

50. Refer to the given graph which shows the effect of pH on the activities of three enzymes, *X*, *Y* and *Z*.



The three enzyme samples, *X*, *Y* and *Z* are taken from which parts of the human alimentary canal?

	X	*Y*	*Z*
A.	Duodenum	Mouth	Stomach
B.	Mouth	Stomach	Duodenum
C.	Stomach	Duodenum	Mouth
D.	Stomach	Mouth	Duodenum

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set B

Year 2014

1. Which would be the ascending order of the following?

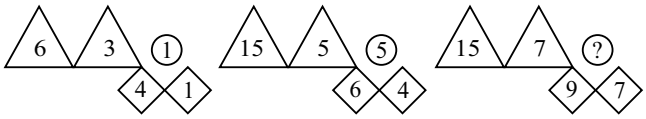
   1. Trillion
   2. Thousand
   3. Billion
   4. Hundred
   5. Million

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

2. If the days of the week are replaced by every alternate letter of the English alphabet, with Wednesday replaced by E, Thursday by G and so on, then fifth day beginning from Friday will be shown by which of the following ?

   A. E
   B. I
   C. O
   D. Q

3. A set of figures carrying certain characters is given. Assuming that the characters in each set follows a similar pattern, find the missing character.

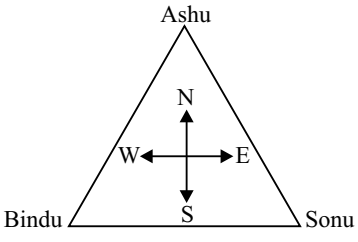


   A. 5
   B. 6
   C. 4
   D. 3

4. Three of the following four are alike in a certain way and hence form a group. Which is the one that does not belong to that group?

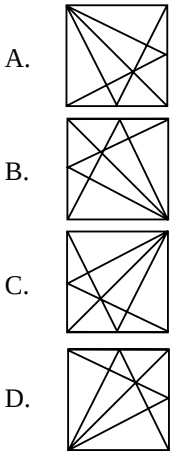
   A. 1331
   B. 2197
   C. 3375
   D. 4913

5. Ashu, Bindu and Sonu are standing at the corners of an equilateral triangle as shown in figure. They all run along the sides in clockwise direction and stops after covering 1½ sides. Now which of the following statements is true?



   A. Bindu is to the west of Sonu.
   B. Ashu is to the south-east of Bindu.
   C. Ashu is to the south-west of Sonu.
   D. Sonu is to the north-west of Ashu.

6. Select a figure from the options, which when placed in the blank space of Fig. (X) would complete the pattern.



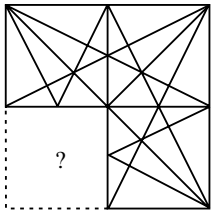
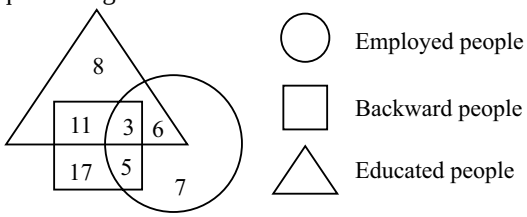


Fig. (X)

7. Study the Venn diagram carefully and answer the question given below.



   Which region represents the backward uneducated people those are employed?

   A. 14
   B. 5
   C. 7
   D. 11

8. Find the mirror image of the Fig. (X), if the mirror is placed vertically to the right.

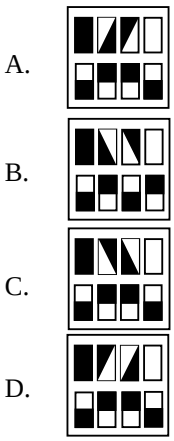
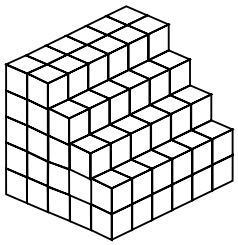



Fig. (X)

9. A man, pointing to a photograph, says, "The lady in the photograph is my nephew's maternal grandmother." How is the lady in the photograph related to the man's sister who has no other sister?

   A. Sister-in-law
   B. Mother-in-law
   C. Mother
   D. Data inadequate

10. How many cubes are there in the pile?



A. 95
B. 114
C. 100
D. 115

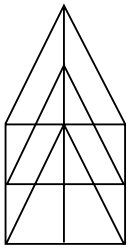
11. At the end of a business conference, all the ten people present shake hands with each other once. How many handshakes will there be altogether?

A. 20 B. 45
C. 55 D. 90

12. If the alphabets are written in reverse order after interchanging alphabets from 'C to M' with those from 'P to Z' respectively, which letter would be midway between E and S in the new order ?

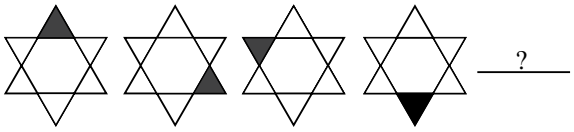
A. Z B. Y
C. N D. X

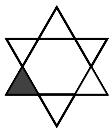
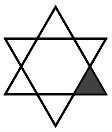
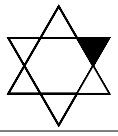
13. How many triangles are there in the given figure?



A. 21
B. 23
C. 25
D. 22

14. Which of the following figures will continue the given series?



A. 
B. 
C. 
D. 

15. Select a figure from the options in which Fig. (X) is exactly embedded as one of its part.

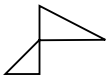
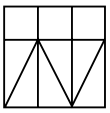
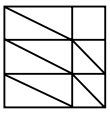
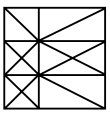
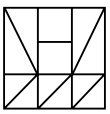
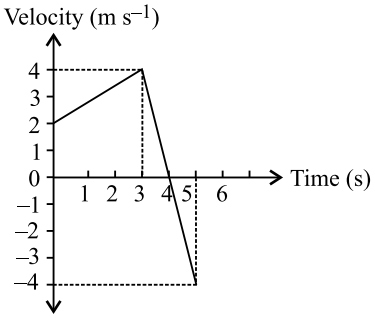


Fig. (X)

A. 
B. 
C. 
D. 

SCIENCE

16. The diagram shows the velocity against time graph for the motion of a body. What is its displacement in the first 5 s?

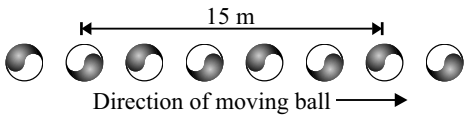


A. 11 m
B. 13 m
C. 7.5 m
D. 9 m

17. The melting point of a substance is 125°C, and its boiling point is 305°C. At 105°C, the substance is in the _____ .

A. Solid state
B. Liquid state
C. Gaseous state
D. Solid and liquid state

18. The given diagram shows a series of images of a moving ball captured by a camera.



The ball was moving at a constant velocity and the images were taken at a constant rate of 10 per second. What is the speed of the ball?

A. 30 m s^{-1} B. 20 m s^{-1}
C. 45 m s^{-1} D. 15 m s^{-1}

19. A camera makes use of a converging lens to produce an image. If the camera captures a distant object, then which of the following sets of characteristics of image is correct?

A. Virtual, inverted, same size
B. Real, inverted, diminished
C. Real, upright, same size
D. Virtual, upright, diminished

20. Bulb 1 and bulb 2 are connected in series as shown in the given figure (i).
What will happen to the brightness of these two bulbs when a third identical bulb is connected across bulb 1 as shown in the given figure (ii)?

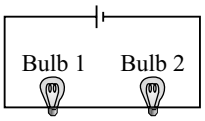


Figure (i)

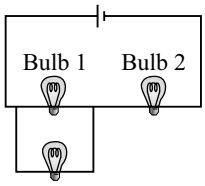


Figure (ii)

	Bulb 1	Bulb 2
A.	Brighter	Brighter
B.	Brighter	Dimmer
C.	Dimmer	Dimmer
D.	Dimmer	Brighter

21. An old man moves along a semi-circular track of radius 40 m during morning walk. If he starts at one end of the track and reaches the other end, the distance covered and displacement of the man with respect to the starting point are respectively _____ .

A. 120 m, 40 m
B. 126 m, 80 m
C. 110 m, 60 m
D. 50 m, 120 m

22. A sphere, a cube and a thin circular plate, all of same material and same mass, are initially heated to same high temperature. Then the _____ .

A. Sphere will cool fastest and cube the slowest
B. Plate will cool fastest and sphere the slowest
C. Cube will cool fastest and sphere the slowest
D. Sphere will cool fastest and plate the slowest

23. Rohan blows air with a straw near the opening of another straw which has its other end in a soft drink bottle as shown in the given figure. The level of the soft drink in the straw rises up as soon as air is blown over its open end. Which one of the following best explains the reason for rise in level of the drink?

A. Blowing of air increases pressure over the open end of straw.
B. Blowing of air decreases the pressure on the surface of soft drink in the bottle.
C. Blowing of air decreases pressure over the open end of straw.
D. Blowing of air increases the pressure on the surface of soft drink in the bottle.

24. If the strength of the current flowing through a coil is increased, then which of the following statements is true regarding it?

A. Strength of the magnetic field decreases.
B. Strength of the magnetic field increases.
C. Amount of heat generated due to resistance decreases.
D. Strength of the magnetic field remains constant.

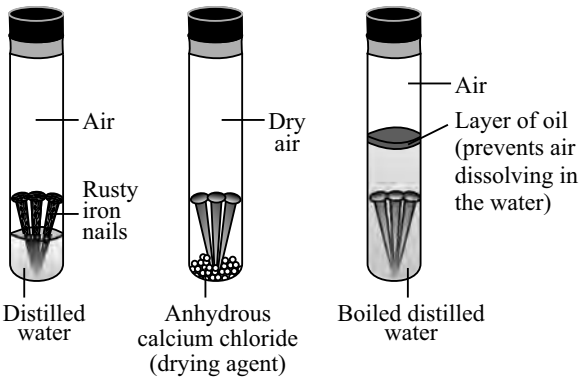
25. Some changes are classified as given below :

S. No.	Change	Chemical change	Reversible change
I.	Sliced apple turning brown	×	×
II.	Crystallisation of sugar	×	✓
III.	Cooking of vegetables	×	✓
IV.	Photosynthesis	✓	×
V.	Developing photo-graphic films	×	✓
VI.	Crumpling of paper	×	✓

Which of the above changes are incorrectly matched?

A. I, II, III and VI
B. I, III and V
C. II, IV and VI
D. All are correct.

26. Observe the following experimental set-up carefully.



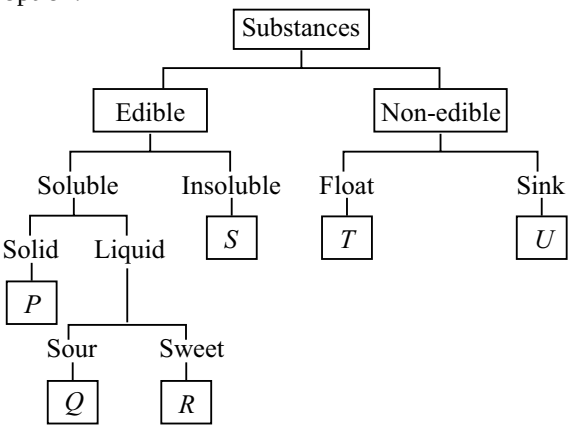
What conclusion can you draw?

A. Only air (dry) can cause rusting.
B. Air and water are needed for rusting.
C. Only water (air free) can cause rusting.
D. Data is insufficient to conclude anything.

27. Yash wants to prepare lemonade for his mother. He has no idea about the quantity of water, salt, sugar and lemon to be added. Suddenly, he observes that no more salt or sugar can be dissolved in the amount of water he has taken.
Which of the following statements is not correct?

A. The solution obtained is saturated solution.
B. Yash can solve his problem by using large quantity of water.
C. By stirring well, more salt can be dissolved.
D. Some more sugar can be dissolved in solution by heating.

28. Study the given flowchart and select the appropriate option.



	P	*Q*	*S*	*U*
A.	Glucose	Lemon juice	Mustard oil	Eraser
B.	Eraser	Mustard oil	Thermocol balls	Honey
C.	Thermocol balls	Lemon juice	Mustard oil	Glucose
D.	Honey	Glucose	Eraser	Thermocol balls

29. In the given reaction :

$(P) + CO_2 \longrightarrow (Q) + (R)$ (Milky)

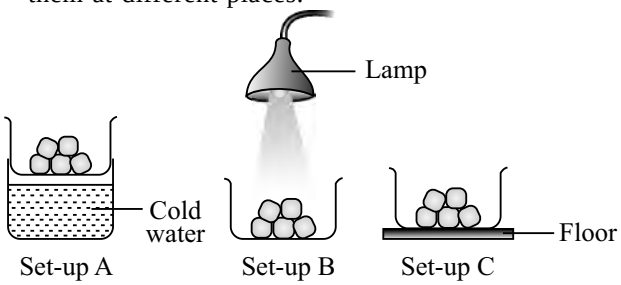
China rose indicator → Turns green

Red litmus solution → No change in colour

P, *Q* and *R* are respectively

A.	$CaCO_3$	$Ca(OH)_2$	H_2O
B.	$Ca(OH)_2$	$CaCO_3$	H_2O
C.	$Mg(OH)_2$	H_2O	MgO
D.	$Ca(OH)_2$	H_2O	$CaCO_3$

30. Kritika set-up the experiment as shown in the diagram. She took three identical containers with ice and left them at different places.



After 10 minutes, she observed that lowest amount of water was present in

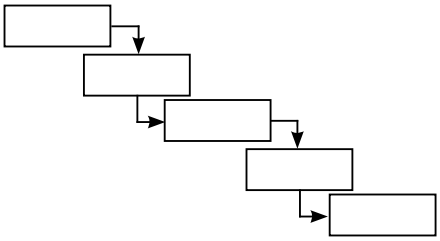
A. Set-up A
B. Set-up B
C. Set-up C
D. All set-ups contain equal amount of water.

31. Match the problems given in Column-I with their remedies in Column-II and mark the correct option from the given codes.

	Column-I		**Column-II**
a.	Indigestion	(i)	Calamine solution
b.	Bee sting	(ii)	Calcium carbonate
c.	Tooth decay	(iii)	Milk of magnesia
d.	Wasp sting	(iv)	Vinegar

A. a-(iii), b-(iv), c-(ii), d-(i)
B. a-(iii), b-(i), c-(ii), d-(iv)
C. a-(i), b-(iii), c-(iv), d-(ii)
D. a-(iv), b-(i), c-(iii), d-(ii)

32. The given diagram was drawn to show the sequence of events associated with acid rain pollution but was mistakenly left blank.

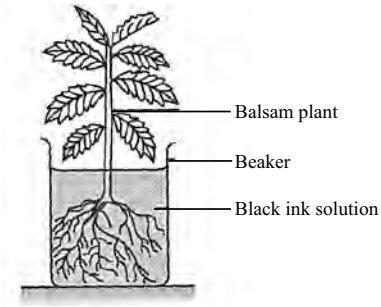


Complete the diagram with correct sequence of events from the following list.

a. Sulphur dioxide rises into the atmosphere
b. Acid rain falls
c. Fish die in acidified lakes
d. Discarded car batteries leak acid
e. Fuel combustion in power stations
f. Ozone is produced in power stations
g. Pollutant combines with water vapour

A. e, d, a, f, c
B. e, a, g, b, c
C. d, f, g, b, c
D. c, g, f, e, b

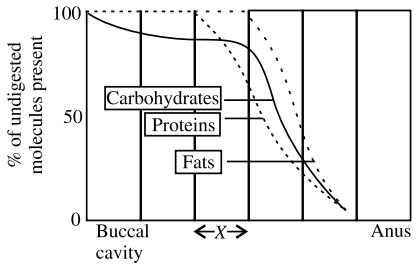
33. Siddhi put a balsam plant in a beaker of black ink as shown below. After 3 days, she cut open a section of the stem of the plant and observed it.



Which one of the following diagrams would she observe?

A. 
B. 
C. 
D. 

34. The given graph shows the percentage of undigested carbohydrates, proteins and fats through successive parts of the human alimentary canal.

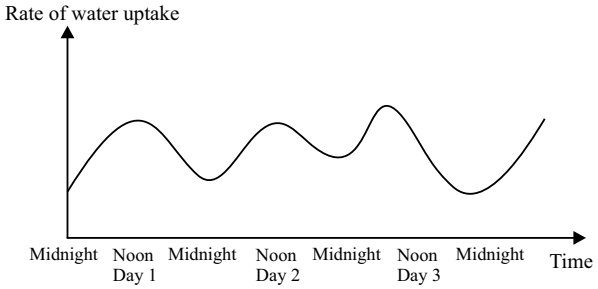


Why does the percentage of undigested carbohydrates remain constant in part *X*?

A. All the starch has been digested and only other carbohydrates remain.
B. Protease at part *X* prevents the salivary amylase from acting on starch.
C. The acidic conditions of part *X* prevent salivary amylase from acting on starch.
D. All the carbohydrates have been digested before reaching part *X*.

---

35. The rate of water uptake by a *Hibiscus* plant kept outdoors was recorded over a few days. The graph below shows the results obtained.



Which of the following does not explain why water uptake was higher at noon than midnight on all the three days?

A. Transpiration pull is stronger in high light intensity.
B. The rate of transpiration increases with temperature.
C. The occurrence of photosynthesis in the guard cells opens the stomata during the daytime.
D. Air is generally more humid in day time which increases the transpiration pull.

---

36. Kanika noticed that her potted plant was not growing healthily. She put three earthworms into the pot. After a few weeks, she noticed that her plants looked healthier. What could be the possible reason for this?

A. The earthworms ate up the pests in the soil.
B. The earthworms helped the plant to take in water.
C. The earthworms allowed the plant to make food faster.
D. The earthworms increased the air and nutrient content of the soil.

37. Which conditions would result in the highest rate of movement of oxygen from the alveolus into the blood capillaries?

	Concentration of oxygen in the alveolus	Concentration of oxygen in blood capillary	Rate of blood flow in blood capillary
A.	High	Low	Fast
B.	High	Low	Slow
C.	Low	High	Fast
D.	Low	High	Slow

---

38. Fish are adapted for swimming and their swimming speed depends on several factors such as shape of the fins, body etc. Keeping this in mind, arrange the following fish in order, starting from the fastest swimmer to the slowest.

P *Q* *R*

A. *P*, *Q*, *R*
B. *P*, *R*, *Q*
C. *Q*, *R*, *P*
D. *Q*, *P*, *R*

---

39. Garima carried out a fair test to find out the speed with which water passed through four different kinds of soil. She recorded her findings in the table below.

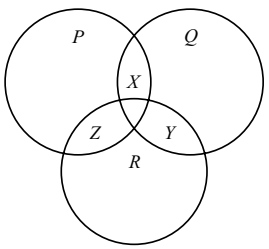
Kind of soil	*P*	*Q*	*R*	*S*
Time taken (seconds)	33	23	45	18

In which type of soil would you find the mangrove trees growing in?

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

---

40. The given Venn diagram represents characteristics of three gases *P*, *Q* and *R*. In atmosphere, more than 3/4 part of air consists of *R*, about 1/4 part consists of *P* and a very minor fraction is composed of *Q* and other gases.



Select the incorrect option regarding the characteristics of *X*, *Y* and *Z*.

A. *X* – Support life on earth
B. *Y* – Inhibit combustion
C. *Z* – Form compounds that are components of acid rain
D. None of these

41. Which of the following statements support(s) the fact that the upper surface of a leaf is usually greener than the lower surface?
(i) More chlorophyll is present on the upper surface to absorb more light.
(ii) There are more stomata present on the upper surface than the lower surface.
(iii) More sugar is formed on the lower surface.
(iv) The green leaves look greener under the hot Sun.
A. (i) only B. (ii) and (iii)
C. (ii) and (iv) D. (iv) only

42. Read the following statements (i-iv) with blanks and select the option that correctly fills the blanks in any two of the statements.
(i) The process of unwinding the silk filaments from the cocoon and combining them together is called _____.
(ii) _____ is removal of fleece from animal.
(iii) _____ is the principle component of silk.
(iv) _____ straightens the woollen fibre and also removes residual dirt.
A. (i) Reeling, (ii) Sorting
B. (ii) Scouring, (iv) Carding
C. (iii) Fibroin, (iv) Carding
D. (i) Weaving, (iii) Fibroin

43. The oxygen cycle is a delicately balanced process. Which of these, however, can upset this balance?
A. Acid rain and ozone depletion
B. Deforestation and excessive burning of fuels
C. Excessive use of fertilizers and pesticides
D. Overpopulation and forestation

44. The given passage is on the production of cotton fabric. It has some errors. One of which is highlighted for your reference. Select the number of errors in it, including the given error.
Cotton is a soft fibre that grows around the fruit of the cotton plant (cottonbolls). After maturing, cottonbolls are burst open, the seeds are then separated from the cotton fibres by shearing. This process was earlier done by machines, nowadays done by hands. The raw cotton fibres are pulled apart and cleaned to remove all dust and impurities. This process is known as carding. The fibre is then cleaned, straightened and made into soft, untwisted fabrics. This process of making fabrics is known as spinning. A yarn is made from two sets of fabrics arranged together. This is done by knitting.
A. 4 B. 8
C. 10 D. 5

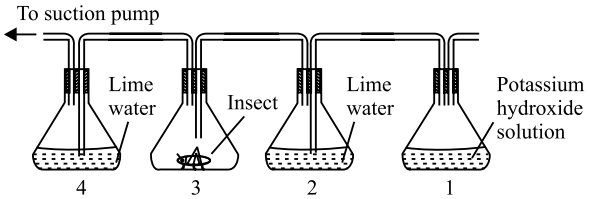
45. Match column I with column II and select the correct option from the codes given below.

Column I (Foods)		Column II (Major Nutrient present)
(a)	Cheese, egg, milk	1. Iron
(b)	Yellow or orange coloured fruits or vegetables	2. Vitamin D
(c)	Guava, tomato, citrus fruit	3. Calcium
(d)	Green leafy vegetables	4. Vitamin A
		5. Vitamin C
		6. Proteins

A. a-3; b-2, 5; c-5; d-1, 4
B. a-3, 6; b- 4; c-5; d-1, 2
C. a-3, 6; b-1, 2; c-4; d-5
D. a-4, 5; b-1; c-3, 6; d-2

ACHIEVERS SECTION

Direction (Q. No. 46 and 47) : Refer to the given experimental set-up to answer the questions.

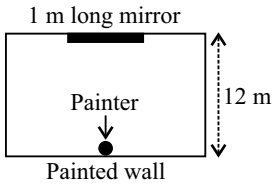


46. What is the purpose of flask 2?
A. To dry the air entering flask 3 for oxygen
B. To test the air entering flask 3 for carbon dioxide
C. To test whether the gas produced by the insect contains carbon dioxide
D. To remove carbon dioxide from the air entering flask 3

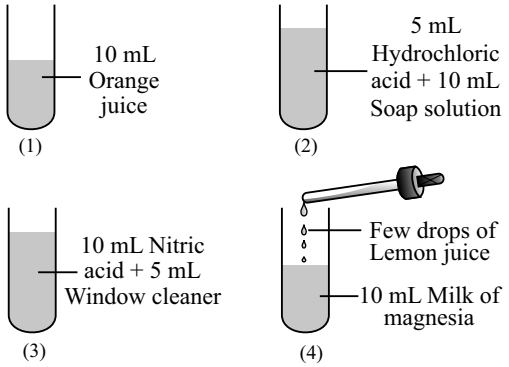
47. Which of the following statements regarding this set-up is not true?
A. Any carbon dioxide found in flask 3 is produced by the insect.
B. Only the solution in flask 4 should show a visible change.
C. The insect will die after some time due to the lack of oxygen.
D. The purpose of flask 1 is to remove carbon dioxide from the air.

48. A painter leans his back against a painted wall while looking into a 1 m long mirror at the opposite end of a rectangular room as shown in the given figure. How much of the painted wall can he see through the given mirror?

A. 1 m
B. 2 m
C. 6 m
D. 12 m



49. A science teacher has arranged the following sets of test tubes.



She asked the students to fill in the blanks by observing the above experimental set-up carefully.

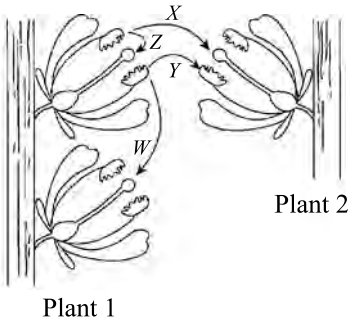
(a) Turmeric solution turns red in test tubes __(i)__ and __(ii)__.

(b) China rose indicator turns dark pink in test tubes __(iii)__ and __(iv)__.

(c) Phenolphthalein gives pink colour in test tubes __(v)__ and __(vi)__.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
A.	2	4	3	4	1	3
B.	4	2	1	3	4	1
C.	1	3	2	4	1	3
D.	2	4	1	3	2	4

50. The diagram below shows two plants of the same species. Refer to the diagram to answer the following questions.



(i) Which arrow indicates a process that would not lead to sexual reproduction?

(ii) Which arrow represents a type of pollination that would result in greater adaptability of the particular species to potential environmental changes?

A. (i)-*Y*, (ii)-*Z*
B. (i)-*Z*, (ii)-*X*
C. (i)-*Y*, (ii)-*X*
D. (i)-*X*, (ii)-*Y*

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set 1

Year 2015

1. Select a figure from the options which does not satisfies the same condition of placement of the dots as in Fig. (X).

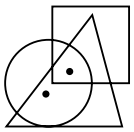
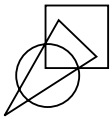
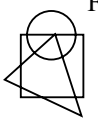
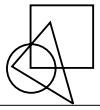
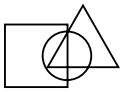


Fig. (X)

A. 

B. 

C. 

D. 

2. If in a certain code 'VERBAL' is written as 'YHUEDO', then how will 'PERFECT' be written in the same code language?

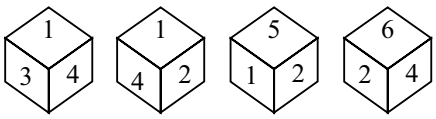
A. CTZXPUV B. RGTHGEV
C. SHUIHFW D. SHTHGFW

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

7, 3, 8, 6, 10, 9, 13, 12, 17, ?, 22

A. 13 B. 14
C. 15 D. 16

4. The four different positions of a dice are given below.



Which number is on the face opposite to 1 ?

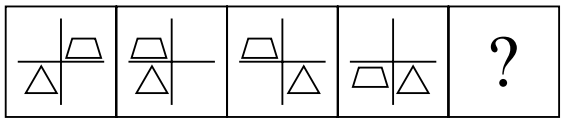
A. 6 B. 2
C. 3 D. 4

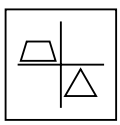
5. Pointing to a photograph X said to his friend Y, "She is the only daughter of the father of my mother." How X is related to the person in the photograph?

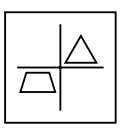
A. Sister B. Son
C. Nephew D. None of these

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

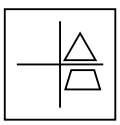
Problem Figures



A. 

B. 

C. 

D. 

7. Five friends Aman, Karan, Gaurav, Raman and Pawan are sitting around a circle facing the centre. Pawan is second to the left of Raman, who is to the immediate left of Gaurav. Karan is the neighbour of Gaurav. Then who is sitting to the immediate right of Gaurav?

A. Aman B. Pawan
C. Raman D. Karan

8. Tarun faces towards North. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?

A. South-West B. South
C. North-West D. South-East

9. Select a figure from the options, which when placed in the blank space of Fig. (X) would complete the pattern.

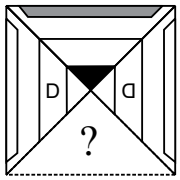
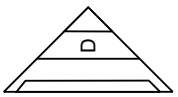
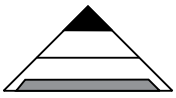
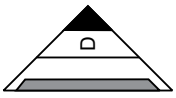


Fig. (X)

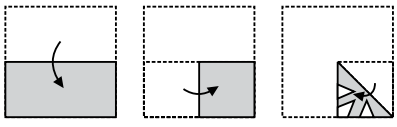
A. 

B. 

C. 

D. 

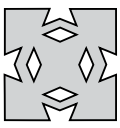
10. The question consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. Select a figure from the options which would most closely resemble the unfolded form of fig. (Z).

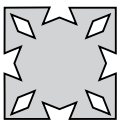


X Y Z

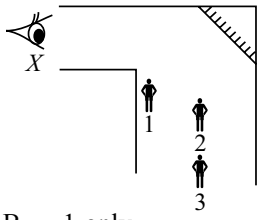
A. 

B. 

C. 

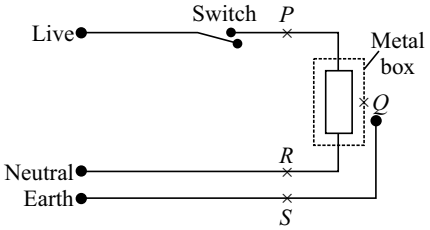
D. 

11. A plane mirror is positioned at the corner of a road as shown in the given figure. Which man/men can the observer *X* see through the mirror?



A. 2 only
B. 1 only
C. 1 and 2 only
D. 2 and 3 only

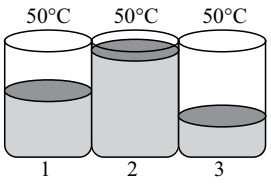
12. The given diagram shows an electrical appliance with a metal box, indicated by the dotted line, connected to a mains supply. Where should the fuse be placed?



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

13. Which of the following statements are true?
(i) High speed wind increases air pressure.
(ii) At night, the land cools faster than water which results in land breeze.
(iii) At poles, the air is very cold and sinks close to the surface creating high pressure area.
(iv) Air exerts pressure sometimes only.
A. (i) and (ii)
B. (ii) and (iii)
C. (iii) and (iv)
D. (i), (ii) and (iii)

14. Three glasses containing water at the same temperature, are placed side by side touching each other as shown in the given figure. Given that glass 1 contains 0.3 kg of water, glass 2 contains 0.5 kg of water and glass 3 contains 0.1 kg of water. Which of the following statements is true?

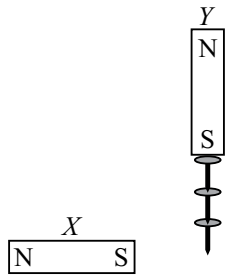


A. Heat flows from glass 1 to glass 2 and from glass 2 to glass 3.
B. Heat flows from glass 2 to glass 1 and from glass 2 to glass 3.
C. Heat flows from glass 1 to glass 2 and from glass 3 to glass 2.
D. Heat does not flow among these three glasses.

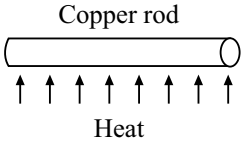
15. Which of the following is correct for lateral inversion?
A. Right side of the object will be right side of the image.
B. Left side of the object will be left side of the image.
C. Upside of the object will be down side of the image.
D. Right side of the object will be left side of the image.

16. Read the given statements and mark the correct option.
Statement 1 : One complete to and fro motion of a clock's pendulum takes one second.
Statement 2 : Anything that occurs or appears at regular intervals can help us to measure time.
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. Statement 1 is false but statement 2 is true.

17. A magnet *X* is being moved slowly towards another magnet *Y* which has attracted steel pins as shown in the given figure. The string of attracted pins
A. Remains stationary
B. Gets attracted to the left
C. Gets repelled to the right
D. Falls off from the magnet.

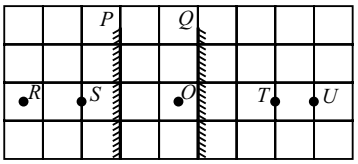


18. The diagram shows a thin copper rod being heated evenly along its length. Which of the following statements is true about the rod?



A. The bar expands and becomes lighter.
B. The bar will become shorter in length.
C. The bar expands and its length increases.
D. The bar expands and becomes heavier.

19. An object *O* is placed in between two plane mirrors, *P* and *Q*, as shown in the given figure.



Which is a possible image of the object?
A. *R*
B. *S*
C. *T*
D. *U*

20. Reeta puts two different objects in each of the following containers.

Container (i) : Copper coin and iron nail

Container (ii) : Steel nail and aluminium earring

Container (iii) : Marble and gold coin

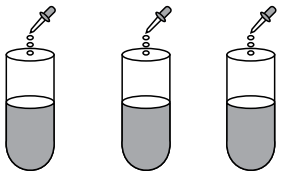
Container (iv) : Nickel coin and steel nail

She can use a magnet to separate the objects in containers _____ .

A. (i) and (ii) B. (i), (ii) and (iii)

C. (i), (ii) and (iv) D. (i), (ii), (iii) and (iv)

21. The given figures show the colour changes in test tubes I, II and III, when China rose indicator is added to them. The respective solutions in test tubes I, II and III are



A. Soda water, Nitric acid, Orange juice

B. Vinegar, Lime water, Sugar solution

C. Sodium hydroxide, Lemon juice, Baking soda

D. Tamarind juice, Salt solution, Soap solution

22. On the basis of physical and chemical changes, find the odd one out.

P. Oxidation of a slice of brinjal

Q. Burning of magnesium ribbon

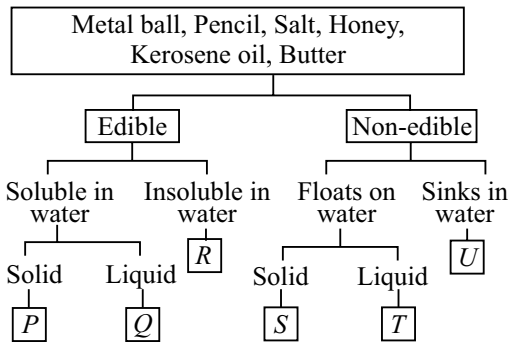
R. Crystallisation of copper sulphate

S. Corrosion of a metal

A. *P* B. *Q*

C. *R* D. *S*

23. The given flowchart was prepared by Neelima for sorting materials into different groups. She handed over the chart to her teacher with few blanks. Fill in the blanks from the given options.



A. *P*-Butter, *Q*-Honey, *R*-Salt, *S*-Metal ball, *T*-Kerosene oil, *U*-Pencil

B. *P*-Salt, *Q*-Honey, *R*-Butter, *S*-Pencil, *T*-Kerosene oil, *U*-Metal ball

C. *P*-Salt, *Q*-Butter, *R*-Honey, *S*-Metal ball, *T*-Pencil, *U*-Kerosene oil

D. *P*-Pencil, *Q*-Honey, *R*-Butter, *S*-Salt, *T*-Kerosene oil, *U*-Pencil

24. Which of the following changes does not require heat?

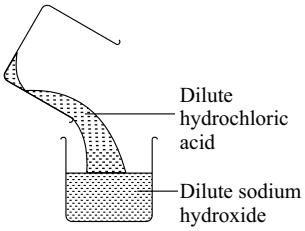
A. Wet clothes to dry clothes

B. Rolling out *roti* from a ball of dough

C. Baking of a cake

D. Expansion of metal rim

25. Dilute hydrochloric acid is added to dilute sodium hydroxide as shown in the figure.



Which of the following is incorrect about the mixing of these substances?

I. There is no change in the arrangement of atoms.

II. On mixing the substances, two new products will be formed.

III. The word equation for the reaction is

Hydrochloric acid + Sodium hydroxide $\longrightarrow$ Sodium chloride + Water

IV. The chemical reaction is called neutralisation and it is endothermic.

A. II and III B. III and IV

C. I and II D. I and IV

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

	Column I		**Column II**
P.	Ascorbic acid	(i)	Organic matter
Q.	Indigestion	(ii)	Calamine solution
R.	Ammonium hydroxide	(iii)	*Amla*
S.	Ant bite	(iv)	Milk of magnesia
T.	Basic nature of soil	(v)	Window cleaner

	P	**Q**	**R**	**S**	**T**
A.	(iii)	(iv)	(v)	(i)	(ii)
B.	(v)	(ii)	(iv)	(iii)	(i)
C.	(ii)	(iii)	(v)	(i)	(iv)
D.	(iii)	(iv)	(v)	(ii)	(i)

27. A mixture contains three different substances *P*, *Q* and *R*. The properties of these substances are listed in the given table.

Substances	**Properties**
P, *Q* and *R*	All of same size
P	Heavy, insoluble in water
Q	Light, insoluble in water
R	Powder, soluble in water

Which of the following sequence of methods will be suitable for separating each of the components from the mixture?

A. Filtration followed by evaporation

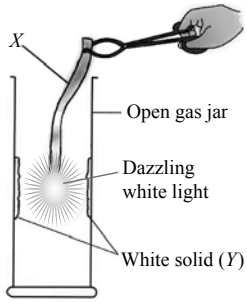
B. Churning followed by magnetic separation

C. Sedimentation-decantation and filtration followed by evaporation

D. Evaporation followed by winnowing

28. Observe the given diagram carefully.

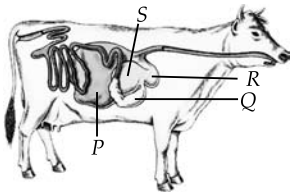
Y + Water $\longrightarrow$ Z
(Base)



X, Y and Z are respectively

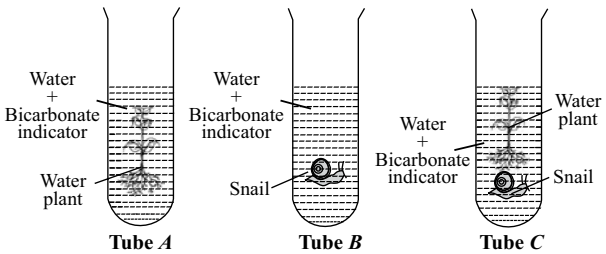
A. Ca, CaO, $Ca(OH)_2$
B. Mg, MgO, $Mg(OH)_2$
C. Na, Na_2O, NaOH
D. C, CO_2, H_2CO_3

29. Refer to the given diagram of stomach of ruminant mammal with its parts labelled as P, Q, R and S and select the correct option.



A. The parts labelled P, Q, R and S are called reticulum, rumen, abomasum and omasum, respectively.
B. The part labelled Q is true stomach.
C. Food is completely digested in chambers P and R.
D. Digestion of cellulose takes place in P, S and R.

30. Three tubes A, B and C, as shown in the figure, were left in sunlight for one hour. Each tube was provided with a bicarbonate indicator which is used to indicate the presence of carbon dioxide in aqueous solutions. The indicator was red at the start of experiment.



Which of the following changes in the colour of indicator will be observed in the experiment?

A. Bicarbonate indicator will stay red in all the three tubes.
B. Colour of bicarbonate indicator in test tube C will change to yellow.
C. Colour of bicarbonate indicator in test tube A will change to purple.
D. Colour of bicarbonate indicator will change to purple in test tube B.

31. Sheep are the major source of wool. During the production of wool from a sheep, it passes through several steps, such as scouring (P), drying (Q), dyeing (R), spinning (S), shearing (T) and carding (U).
Which of the following options shows the correct sequence of these steps?

A. $T \rightarrow P \rightarrow Q \rightarrow U \rightarrow R \rightarrow S$
B. $P \rightarrow T \rightarrow Q \rightarrow R \rightarrow U \rightarrow S$
C. $U \rightarrow P \rightarrow R \rightarrow Q \rightarrow T \rightarrow S$
D. $R \rightarrow P \rightarrow Q \rightarrow T \rightarrow S \rightarrow U$

32. Read the given paragraph.
__W__ is a form of malnutrition in which nutrients are over supplied relative to amounts required for normal growth, development and metabolism. It leads to __X__. Deficiency is another form of malnutrition. Deficiency of nutrients like protein leads to __Y__ whereas deficiency of proteins and calories leads to __Z__.
Identify W, X, Y and Z and select the option that correctly fills the blanks in above paragraph.

	W	*X*	*Y*	*Z*
A.	Overnutrition	Obesity	Kwashiorkor	Marasmus
B.	Undernutrition	Scurvy	Marasmus	Kwashiorkor
C.	Overnutrition	Blood pressure	Anaemia	Rickets
D.	Undernutrition	Obesity	Marasmus	Goitre

33. Match the items given in column I with the items in columns II and III and select the correct option.

	Column I		**Column II**		**Column III**
P.	Polar bear	*a.*	Desert	1.	Well-padded wide feet
Q.	Monkey	*b.*	Polar region	2.	Flat and broad paws
R.	Camel	*c.*	Tropical forests	3.	Feet with sticky pads
S.	Penguin			4.	Thin and long tail
T.	Red-eyed frog			5.	Streamlined body and webbed feet

	P	*Q*	*R*	*S*	*T*
A.	*b*, 3	*c*, 4	*a*, 4	*c*, 5	*a*, 2
B.	*b*, 2	*c*, 4	*a*, 1	*b*, 5	*c*, 3
C.	*b*, 1	*a*, 4	*c*, 2	*a*, 5	*c*, 5
D.	*b*, 2	*a*, 4	*a*, 3	*b*, 5	*a*, 5

34. Which of the following food items are sources of sucrose, starch and cellulose respectively?

A. Meat, fruits and potatoes
B. Spinach, corn and meat
C. Table sugar, rice and grass
D. Fruits, eggs and wheat

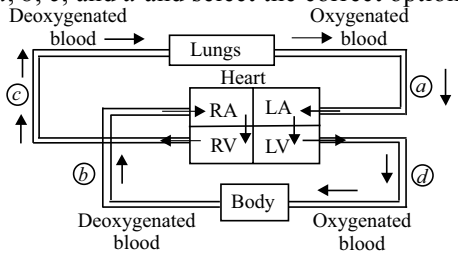
35. Various technical terms related to respiratory system of different organisms are hidden in the given word grid.
Which of the following is not present in the given word grid?

R	M	S	L	U	N	G
I	G	I	L	L	N	T
B	A	O	I	D	O	R
C	R	M	Y	M	S	A
A	H	A	A	N	T	C
G	P	T	B	Z	R	H
E	A	A	T	S	I	E
P	I	R	A	C	L	A

(i) The air tubes of insects.
(ii) Skeletal structure which protects the lungs.
(iii) The opening through which humans inhale air.
(iv) Small opening on the sides of the body of an insect.
(v) A flap like structure which covers the glottis at the time of swallowing in humans.
(vi) Respiratory organ of fish.

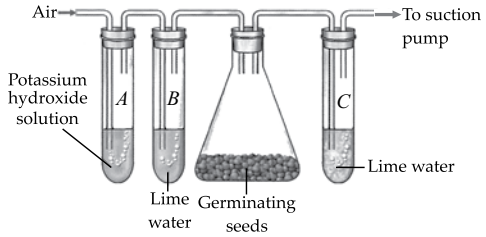
A. (i) and (ii) only
B. (ii), (v) and (vi) only
C. (iii) and (iv) only
D. (iv) and (v) only

36. The diagrammatic representation shows the pulmonary and systemic circulations. Identify the parts labelled as *a*, *b*, *c*, and *d* and select the correct option.



A. *a*- Pulmonary artery, *b*- Pulmonary vein, *c*- Aorta, *d*- Vein
B. *a*- Pulmonary vein, *b*- Vein, *c*- Pulmonary artery, *d*- Aorta
C. *a*- Pulmonary vein, *b*- Aorta, *c*- Vein, *d*- Pulmonary artery
D. *a*- Aorta, *b*- Vein, *c*- Pulmonary vein, *d*- Pulmonary artery

37. Priya conducted an experiment as shown here.



Select the correct statement regarding this.
A. Lime water in test tube *B* does not turn milky because potassium hydroxide solution absorbs the CO_2 from incoming air.
B. Lime water in test tube *C* turns milky as germinating seeds release CO_2 which enters test tube *C*.
C. Lime water in test tube *B* turns milky because germinating seeds release CO_2 into it.
D. Both A and B

38. The given picture shows a camel with its different parts labelled as *P, Q, R, S, T* and *U*.

Which of the following statements is incorrect regarding its adaptations?
(i) *Q* is slit-like and has flap to prevent the entry of sand.
(ii) *R* is leathery for chewing thorny plants.
(iii) *T* is used for storing water.
(iv) *S* is sticky and webbed to prevent it from sinking into sand.
A. (i) and (iii) only
B. (ii) and (iv) only
C. (iii) and (iv) only
D. (ii) and (iii) only

39. The given table shows the characteristics of four different seeds or fruits *P*, *Q*, *R* and *S*.

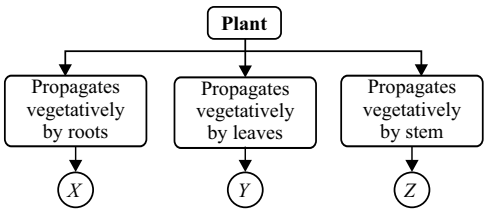
Seed/Fruit	Size	Weight	Other characteristics
P	Small	Light	It has hooks.
Q	Small	Light	It has wings.
R	Big	Heavy	It has fleshy and sweet pulp.
S	Big	Heavy	It is buoyant with a fibrous husk.

By which method *P*, *Q*, *R* and *S* get most likely dispersed?

	P	***Q***	***R***	***S***
A.	By wind	By animals	By water	By animals
B.	By animals	By animals	By explosion	By water
C.	By animals	By wind	By animals	By water
D.	By explosion	By water	By animals	By wind

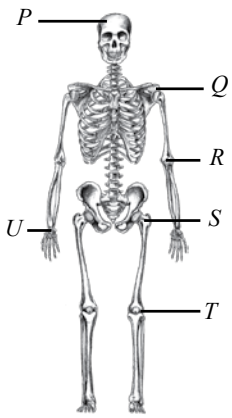
40. Read the given statements and select the correct option.
Statement 1 : The level of groundwater below the surface of the earth at a given place is known as the water table.
Statement 2 : Extensive use of groundwater in cities for domestic and industrial purposes is resulting in lowering of water table.
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.

41. Study the given concept map and identify *X*, *Y* and *Z*.



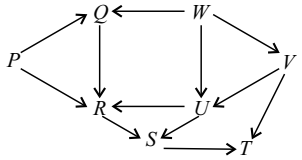
	X	***Y***	***Z***
A.	*Bryophyllum*	*Bougainvillea*	Carrot
B.	*Dahlia*	*Bigonia*	Potato
C.	*Bigonia*	Ginger	*Asparagus*
D.	*Bryophyllum*	Strawberry	*Dahlia*

42. Refer to the given diagram of human skeletal system with various joints labelled as *P*, *Q*, *R*, *S*, *T* and *U*. Select the correct option regarding this.



A. Joints *R*, *T* and *U* move in one plane only.
B. Joints *P, R* and *T* move in more than one plane.
C. Joint *P* is an immovable joint.
D. Joints *R, S* and *T* move in more than one plane.

43. Refer to the given food web.



Which of the following statements is incorrect regarding it?

A. In the given food web, *P* and *W* are producers.
B. The food web consists of more than five food chains.
C. In the given food web, *R* behaves both as primary consumer as well as secondary consumer.
D. In the given food web, *T* could be a deer or rabbit.

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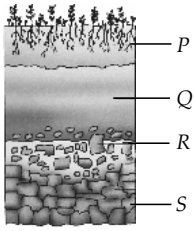
44. The given diagram shows soil profile where different soil layers are labelled as *P*, *Q*, *R* and *S*.



Select the incorrect option regarding this.

A. *P* is rich in humus.
B. Few plant roots can reach *Q*.
C. *R* is saturated with moisture and represents water table.
D. *S* is a porous layer and consists of rock pieces with diameter less than 2 mm.

---

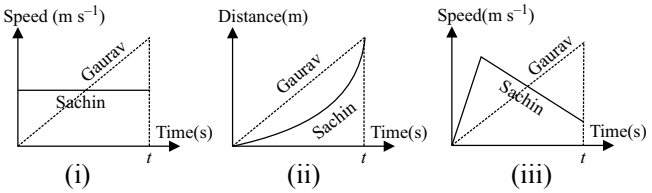
45. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
P.	Weaving	*a.*	Process of making yarn from fibres
Q.	Knitting	*b.*	Spun from fibres and then used to make fabric
R.	Ginning	*c.*	A single yarn is used to make fabric
S.	Spinning	*d.*	Process of arranging two sets of yarns together to make a fabric
T.	Yarn	*e.*	Combing of cotton fibres to remove seeds

	P	***Q***	***R***	***S***	***T***
A.	*c*	*d*	*e*	*a*	*b*
B.	*d*	*c*	*a*	*e*	*b*
C.	*d*	*c*	*e*	*a*	*b*
D.	*c*	*d*	*e*	*b*	*a*

ACHIEVERS SECTION

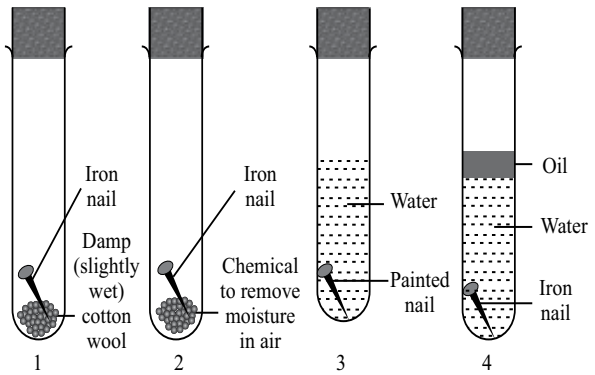
46. In a 100 m race, Gaurav and Sachin reached the finishing line at the same time. Which of the following are possible graphs to show that both competitors reached the finishing line at time *t*?



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

---

47. Anamika has arranged the following experimental set-up to study the conditions necessary for rusting to take place.



Fill in the blanks with an appropriate option.

Both __(i)__ and __(ii)__ are essential for rusting. In test tube __(iii)__, the iron nail will rust faster. The process of depositing a layer of a metal like chromium or zinc on iron to prevent rusting is called __(iv)__.

	(i)	**(ii)**	**(iii)**	**(iv)**
A.	carbon dioxide	moist air	2	oxidation
B.	oxygen	water	1	galvanisation
C.	water	oxygen	3	galvanisation
D.	water	nitrogen	4	corrosion

---

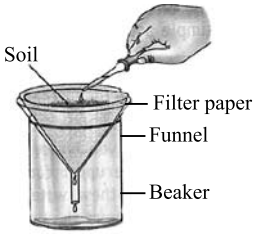
48. Raj is fond of gardening. He planted two different types of flowering plants, pea and papaya in his garden. Both the plants grew healthily in the garden and then flowered after sometime.

To check the fruit setting of these plants Raj covered the flowers of both plants using a polythene bag.

After some days, he removed the polythene bags and found small pea fruits, but no fruits in papaya. What could possibly be the reason for this?

A. Papaya plant did not get essential nutrients for setting fruits and seeds.
B. Papaya plant has unisexual flowers and female flowers can produce fruits in presence of pollinators only.
C. The flower of pea plant gets converted to fruit without pollination and fertilisation.
D. Papaya plant is pollinated by insects whereas pea plant is pollinated by the agency of water.

49. Radha bought three different types of soil samples, *P*, *Q* and *R* from the market and then set-up an experiment as shown to test the suitability of these soils for making statue.



She put 50 gms of dry powdered soil of each sample separately in three different funnels placed over three different beakers and then slowly poured water on the soil samples till the water just started dripping from the funnel. She then weighed the three soil samples separately.

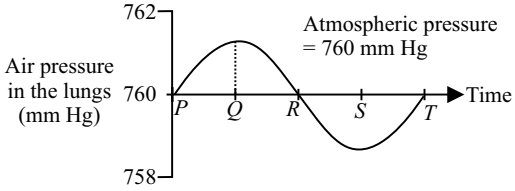
The results are shown in the given table.

Type of soil	**Original weight of soil**	**Weight of soil sample after pouring water**
P	50 gm	60 gm
Q	50 gm	100 gm
R	50 gm	70 gm

Which soil sample can she use for making statue?

A. *P* B. *Q*
C. Both *P* and *Q* D. Both *Q* and *R*

50. The given graph shows changes in the pressure in lungs during breathing.



Which of the following is incorrect regarding this?

(i) Region *R* to *T* represents inhalation.
(ii) Region *P* to *R* represents inhalation.
(iii) Region *P* to *R* represents exhalation.
(iv) Ribcage will move upward and diaphragm will get flattened at point *S*.
(v) Ribcage will move downward and diaphragm will become dome shaped at point *S*.

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

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set 2

Year 2015

1. Three of the following four options are alike in a certain way based on their positions in the given arrangement and so form a group. Find the one that does not belong to that group.

   B 4 @ D A © 7 9 F % 2 R 5 H 6 E * N $ 1 U W 3 P T 8 δ V # Y I

   A. 5 6 2 B. W P U
   C. © 9 D D. δ # T

2. There is a certain relationship on the either side of ::. Identify the relationship and find the missing term.

   REASON : SFBTPO :: MAGNET : ?

   A. NBHMFU B. NBIPFS
   C. NBHOFU D. OCIPGU

3. Which of the following figures do not satisfies the same condition of placement of dots as in Fig. (X)?

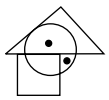
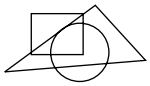
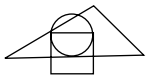


Fig. (X)

A.  B. 

C.  D. 

4. Some boys are sitting in three rows all facing North such that S is in the middle row. P is just to the right of S. Q is just behind of P while R is in the North of S. In which direction of R is Q?

   A. South B. South-West
   C. North-East D. South-East

5. Which of the following options will complete the pattern in Fig. (X)?

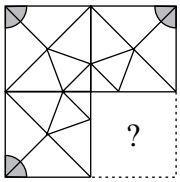


Fig. (X)

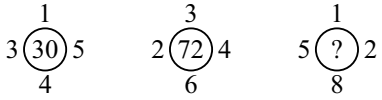
A.  B. 

C.  D. 

6. Anu remembers that her friend had visited her after 13th but before 18th of the month, while Anu's sister remembers that Anu's friend had visited after 16th but before 20th. If it was Friday on 1st of the month, then on which day of the week, Anu's friend visit to her?

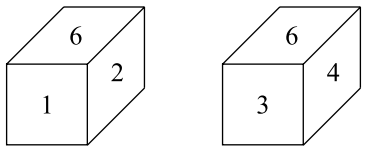
   A. Saturday
   B. Monday
   C. Sunday
   D. Friday

7. Find the missing number, if a certain rule is followed in all the three figures.



   A. 66 B. 40
   C. 61 D. 90

8. Two positions of a dice are shown below.



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

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

9. Select the term from the options which will continue the given series.

   2B11, 4E13, 8H15, ___?___

   A. 15K17
   B. 16K19
   C. 16J17
   D. 16K17

10. Select the correct mirror image of the Fig. (X), if the mirror is placed vertically to the right.

Fig. (X)

A.  B. 

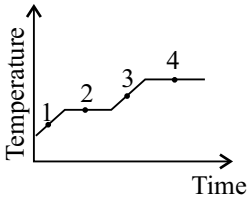
C.  D. 

11. Which of the following statements is/are true regarding the effects of using a thin converging lens instead of a thick converging lens?

(i) The image formed will be brighter.
(ii) The focal length will be longer.
(iii) The image formed will always be virtual.

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

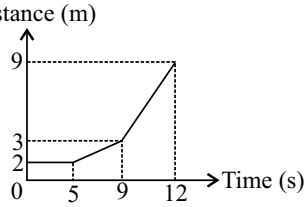
12. A solid substance is placed in a boiling tube and heated steadily. The temperature-time graph of the substance is shown in figure. At which labelled point would the substance be a mixture of liquid and gas?



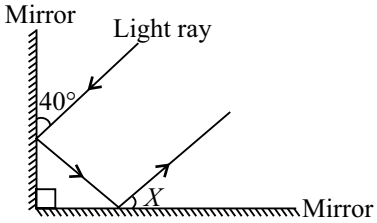
A. 1 B. 2
C. 3 D. 4

13. The distance-time graph of motion of a cycle is shown here. What is the average speed of cycle over a time period of 12 s?

A. 0.48 m s^{-1}
B. 0.58 m s^{-1}
C. 2.17 m s^{-1}
D. 3.17 m s^{-1}



14. Two plane mirrors are placed at 90° to each other. A ray of light strikes one mirror and follows the path as shown in the figure.



What is the value of angle *X*?

A. 20° B. 30°
C. 40° D. 50°

15. A piece of ice is being heated till it turns to water and then to steam. Which of the following statements is true?

A. The molecules expand as ice changes to steam.
B. The molecules move faster as ice changes to steam.
C. The molecules move closer to each other as ice changes to steam.
D. The intermolecular force of attraction increases as ice changes to steam.

16. Which of the following statements about cyclone is/are incorrect?

(i) Cyclones are accompanied by very strong winds.
(ii) The centre of cyclone is a high pressure area.
(iii) Cyclones are known as typhoons in American continent.
(iv) There is heavy rain fall in the centre of cyclone.

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

17. Which car, moving from rest, has an average acceleration of 2.0 m s^{-2}?

A. A car reaching a speed of 10 m s^{-1} in 2 s.
B. A car reaching a speed of 20 m s^{-1} in 5 s.
C. A car reaching a speed of 30 m s^{-1} in 10 s.
D. A car reaching a speed of 40 m s^{-1} in 20 s.

18. Read the given statements and mark the correct option.

Statement 1 : Convex lens can form real and inverted images.

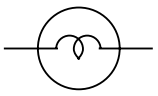
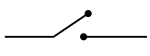
Statement 2 : Convex lens is used as magnifying glass.

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. Statement 1 is false but statement 2 is true.

19. Which coil will make the strongest electromagnet for a given flow of current?

A. A 10 cm coil with 100 turns.
B. A 5 cm coil with 200 turns.
C. A 10 cm coil with 200 turns.
D. A 20 cm coil with 200 turns.

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

	Column I		Column II
(a)	Bulb	(i)	
(b)	Cell	(ii)	
(c)	Battery	(iii)	
(d)	Open switch	(iv)	

A. (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
B. (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
C. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
D. (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

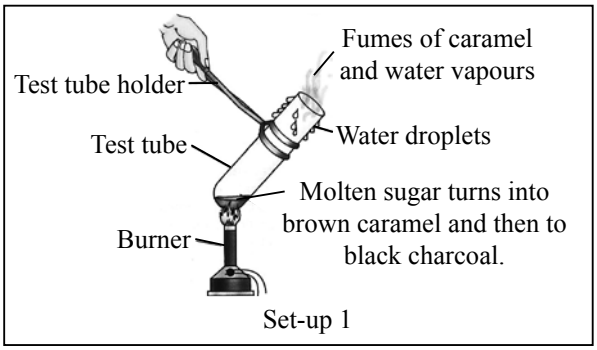
21. Kanika identified the nature of few substances with the help of three different indicators. She listed down her observations in the given table with some blanks.

S. No.	Substance	Red litmus paper	Turmeric solution	China rose indicator
1.	Lime water	blue	*p*	green
2.	Curd	no change	no change	*q*
3.	Table salt	no change	no change	no change
4.	Toothpaste	*r*	red	*s*
5.	Lemon juice	no change	no change	magenta

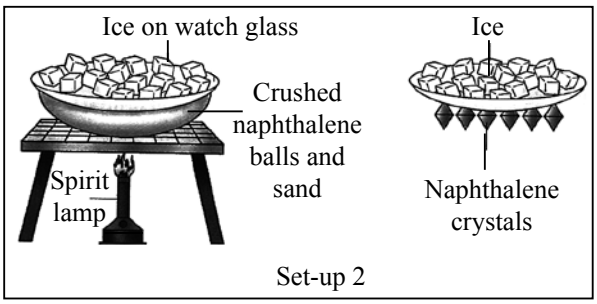
Identify *p*, *q*, *r* and *s*.

	p	*q*	*r*	*s*
A.	Magenta	Green	Blue	Magenta
B.	Red	Magenta	Blue	Green
C.	Blue	Magenta	Red	Green
D.	Green	Red	Magenta	Blue

22. Mrs. Rama, a science teacher has arranged the following set-ups to demonstrate different types of changes.



Set-up 1



Set-up 2

Identify the types of changes taking place in these set-ups.

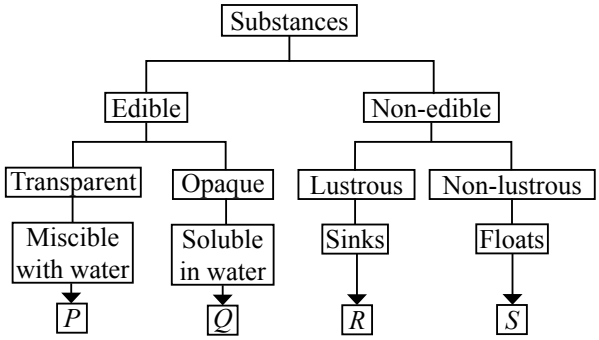
A. In set-up 1, chemical-reversible change is taking place while in set-up 2, physical-irreversible change is taking place.

B. In set-up 1, chemical-irreversible change is taking place while in set-up 2, physical-reversible change is taking place.

C. In both set-ups, physical-reversible changes are taking place.

D. In both set-ups, chemical-irreversible changes are taking place.

23. Four different substances are categorised based on their properties in the given flowchart.



Identify the substances.

A. *P*-Oil, *Q*-Common salt, *R*-Matchstick, *S*-Coin

B. *P*-Common salt, *Q*-Glycerine, *R*-Coin, *S*-Matchstick

C. *P*-Glycerine, *Q*-Common salt, *R*-Coin, *S*-Matchstick

D. *P*-Glycerine, *Q*-Sand, *R*-Coin, *S*-Matchstick

24. Sahil took some iron filings and mixed them well with sulphur powder. He could separate the iron filings with the help of a magnet. Then, he heated the mixture for some time and tried to separate the iron filings with the magnet but he could not because

A. On heating, a chemical change takes place and a new compound is formed

B. On heating, a physical change takes place hence, iron and sulphur get mixed up

C. On heating, iron evaporates and only sulphur is left behind

D. None of these.

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

	Column I		Column II
(i)	Fast change	(p)	Occurrence of day and night
(ii)	Periodic change	(q)	Spoiling of food
(iii)	Reversible change	(r)	Blowing of a balloon
(iv)	Undesirable change	(s)	Dropping an object

	(i)	(ii)	(iii)	(iv)
A.	p	s	q	r
B.	r	q	p	s
C.	s	p	r	q
D.	q	r	s	p

26. Which of the following methods can be used to separate each component of the mixture containing iron filings, chalk powder and sugar?

A. Evaporation, use of a magnet and separating funnel

B. Use of a magnet, filtration, followed by evaporation

C. Winnowing, filtration, followed by condensation

D. Handpicking, threshing, followed by evaporation

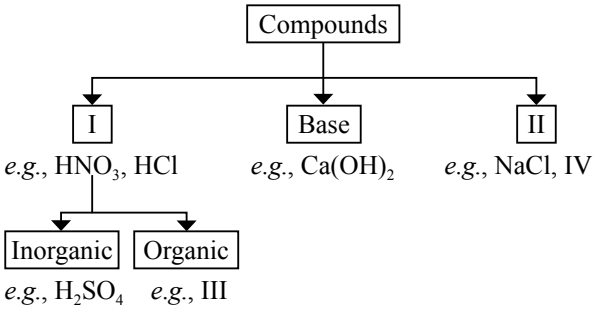
27. Read the given statements and select the correct option.

Statement 1 : Calamine solution is applied on the skin when an ant bites.

Statement 2 : Ant injects ammonia into the skin which can be neutralised by rubbing with calamine solution.

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 and statement 2 is false.
D. Both statements 1 and 2 are false.

28. Observe the given flowchart carefully and mark the option which best represents I, II, III and IV.



	I	II	III	IV
A.	Salt	Acid	Acetic acid	Limestone
B.	Alkali	Soda ash	Iron sulphate	Iron oxide
C.	Acidic Salt	Salt	Hydrochloric acid	Copper sulphate
D.	Acid	Salt	Formic acid	Baking soda

29. Refer to the given table showing the characteristics of three types of fabrics (I, II and III).

Fabrics	Source of individual fibres	Air spaces between fibres	Absorption of water
I	Plant	Less	Medium
II	Animal	More	High
III	Chemical	Minimum	Minimum

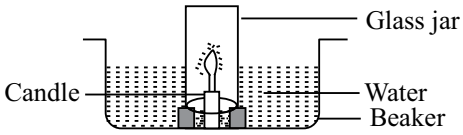
Which of the following statements is incorrect regarding this?

A. Fabric I is more suitable for summer clothing.
B. Fabric II will allow more body heat to escape than fabric I.
C. Fabric III can neither absorb body sweat nor can keep the body cool.
D. Fabric II is more suitable for winter clothing.

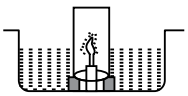
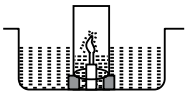
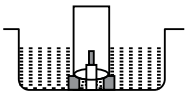
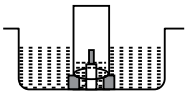
30. If the percolation rate of water through a soil sample is 50 mL/min, then how much time will 500 mL of water take to percolate completely into the soil?

A. 5 minutes B. 10 minutes
C. 15 minutes D. 20 minutes

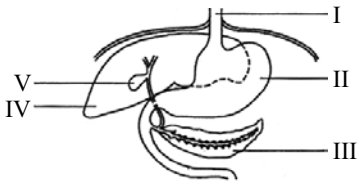
31. Study the given experimental set-up, in which a burning candle has been placed in a beaker filled with water. The candle has been covered by an inverted glass jar.



Which of the following options correctly depicts the results of the experiment after few minutes?

A. 
B. 
C. 
D. 

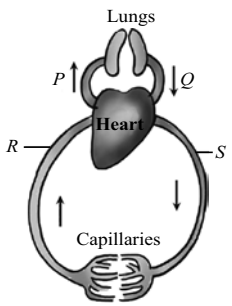
32. Refer to the given diagram which shows various parts of human digestive system labelled as I, II, III, IV and V.



Identify the organs and select the incorrect statement regarding them.

A. Organ V is involved in storage of bile not its production.
B. Organ II secretes digestive juice which contains mucus, hydrochloric acid and digestive enzymes.
C. Organ IV is the largest gland of the body.
D. Organ I is involved in the absorption of water from food.

33. Which of the following statements is correct regarding the given schematic of blood circulation in human body?



A. Structures *P* and *S* have thick, elastic walls to allow stretching.
B. *P* and *R* carry oxygenated blood.
C. *Q* carries deoxygenated blood at high pressure whereas *S* carries oxygenated blood at low pressure.
D. *R* and *S* have a series of valves and are superficially placed.

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

Statement 1 : Chemical digestion of food involves breaking down of food by chewing and churning.

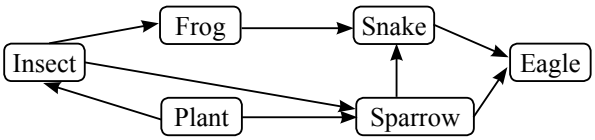
Statement 2 : Mechanical digestion of food involves conversion of complex substances such as carbohydrates into their simpler forms such as glucose by enzymatic action.

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.

35. While using iodine in the laboratory, some drops of iodine fell on Rashmi's socks and some fell on her teacher's saree. The drops of iodine on the saree turned blue-black while the colour of iodine drop did not change on the socks. What can be the possible reason?

A. The socks were made of nylon while saree was made of silk.
B. The saree had been washed in starch solution to make it stiff.
C. The socks were black in colour while the saree was white in colour.
D. After washing, socks had been dipped in iodine solution before drying.

36. Which of the following statements is incorrect for the given food web?



A. The snake is both a predator and a prey.
B. There is one producer and one omnivorous organism in this food web.
C. A decrease in population of frog will cause an increase in insect population.
D. There are three food chains in this food web.

37. Refer to the given key.

I. (a) Fibres obtained from natural resources - Go to II (a)
   (b) Fibres obtained from chemicals - Go to IV (b)
II. (a) Cellulose is the structural material - Go to III
   (b) Fibres made up of complex proteins - Go to IV (a)
III. (a) Fibre obtained from seeds - *P*
   (b) Fibre obtained from stems - *Q*
IV. (a) Poor conductor of heat and gives smell of burning hair when burnt - *R*
   (b) Melts on burning - *S*

Identify *P*, *Q*, *R* and *S* and select the correct option regarding them.

A. *P* is the strongest natural fibre available.
B. *Q* is one of the cheapest fibre and is also known as golden fibre.
C. *R* can be obtained only by killing of source organism.
D. *S* provides the best clothing material for winter clothing.

38. Refer to the given table.

Name of the plant	Presence/Absence of leaves	Mode of nutrition
Mistletoe	*L*	Partially parasitic
Nepenthes	Present	*M*
Cuscuta	*N*	Completely parasitic

Select the correct option for *L*, *M* and *N*.

	L	*M*	*N*
A.	Present	Partially heterotrophic	Absent
B.	Absent	Partially heterotrophic	Absent
C.	Present	Autotrophic	Present
D.	Present	Partially parasitic	Absent

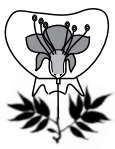
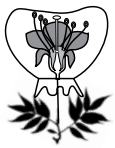
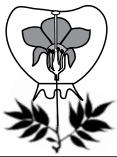
39. Read the given paragraph.

Joints are of different types based on the degree of freedom of movement. The joints found between the skull bones are *P* joints. Joint *Q* is found between the skull and lower jaw. The joint between skull and first vertebra of backbone is *R* joint.

Select the correct option regarding these joints *P*, *Q* and *R*.

A. Joint *P* shows 180° of movement in two planes.
B. Joint *Q* shows 180° of movement in one plane.
C. Joint *R* shows 360° of movement in two planes.
D. Joint *P* shows 360° of movement in one plane.

40. Anushka bagged four different kinds of flowers on the potted plants as shown below and left them undisturbed. Which of these four flowers is the most likely to produce fruits and seeds?

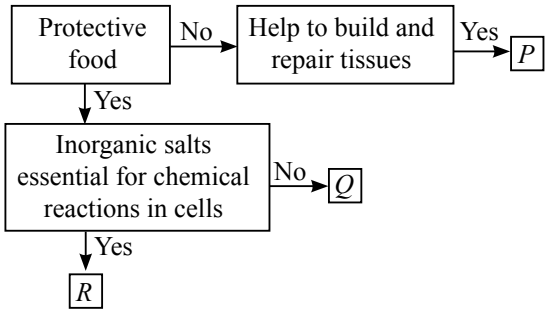
A. 
B. 
C. 
D. 

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

	Column I	Column II
P.	Anther	(i) Usually brightly coloured
Q.	Pedicel	(ii) Contains pollen grains
R.	Stigma	(iii) Stalk of the flower
S.	Petals	(iv) Receives pollen grains

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

42. Refer to the given flow chart.



Identify *P*, *Q* and *R* and select the correct option regarding it.

A. Deficiency of *P* can lead to diseases like kwashiorkor and marasmus.
B. If *Q* is water soluble then it is not stored in body but if it is fat soluble, it can be stored in body for future use.
C. Deficiency of *R* can lead to diseases like anaemia, goitre, rickets, etc.
D. All of these.

43. Chitra wanted to see what body shape would enable an animal to travel most easily through the water. She cut out shapes using pieces of styrofoam and tied a piece of string to each of them. Then she pulled them through the fish pond in school. What factors should she keep the same so that the experiment is a fair one?

(i) The length of the string.
(ii) The size of the shaped-pieces.
(iii) The material used to make the string.
(iv) The material used to make the shaped-pieces.
(v) The strength with which she pulled each shaped-piece through the water.

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

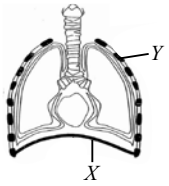
44. Study the following features :

- Flowers are small and dull.
- Pollen grains are light weight.
- Stamens and stigmas are exposed.
- Flowers are colourless and odourless.
- Pollen grains are produced in large numbers.

Above cited features are the characteristics of flowers in which pollination is brought about by the agency of

A. Wind
B. Birds
C. Insects
D. Explosion.

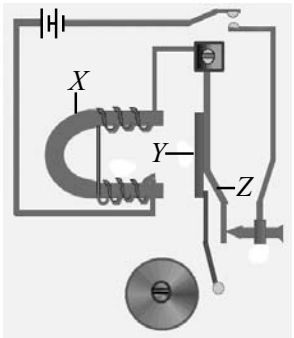
45. Which of the following best describes what happens to the parts *X* and *Y* during inhalation and exhalation?



	Inhalation		Exhalation	
	X	***Y***	***X***	***Y***
A.	Contracts	Moves down	Relaxes	Moves up
B.	Relaxes	Moves down	Contracts	Moves up
C.	Contracts	Moves up	Relaxes	Moves down
D.	Relaxes	Moves up	Contracts	Moves down

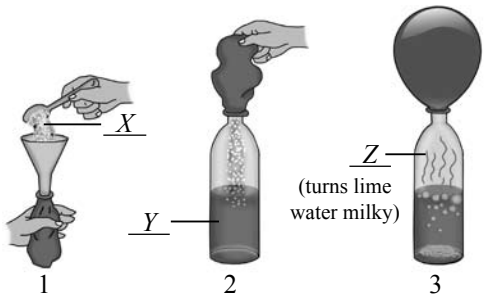
ACHIEVERS SECTION

46. The diagram shows an electric bell. Which materials would be suitable for the parts labelled *X*, *Y* and *Z*?



	X	***Y***	***Z***
A.	Soft iron	Brass	Soft iron
B.	Soft iron	Soft iron	Steel spring
C.	Soft iron	Brass	Brass
D.	Steel spring	Soft iron	Steel spring

47. Observe the given figure carefully and fill in the blanks by choosing an appropriate option.



	X	***Y***	***Z***
A.	Sugar	Nitric acid	Nitrogen
B.	Salt	Ammonium hydroxide	Ammonia
C.	Baking soda	Acetic acid	Carbon dioxide
D.	Copper	Hydrochloric acid	Hydrogen

48. Read the given passage.

Sometimes during heavy physical exercise, your body cannot get enough ___*P*___ to produce the required energy. To get the additional energy, ___*Q*___ respiration occurs in your___*R*___ , during which partial breakdown of glucose occurs and ___*S*___ is produced.

Which of the following statements is incorrect regarding *P*, *Q*, *R* and *S*?

A. *P* represents oxygen.
B. *Q* is the type of respiration that occurs in the presence of oxygen.
C. *R* represents muscle cells of our body.
D. Accumulation of *S* in muscles causes muscular cramps.

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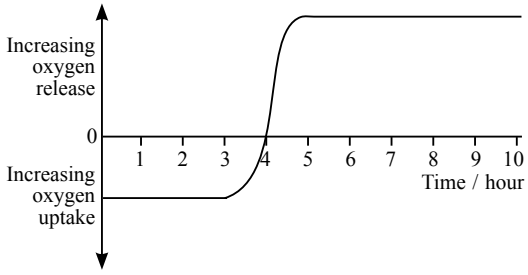
49. The given graph shows the variations in oxygen release and uptake by a plant over a period of 10 hours.



Select the correct statement regarding this.

A. For first three hours, the plant was kept in a dark room.
B. At 3rd hour, the plant was moved to a sunny place.
C. For first 3 hours, the plant was photosynthesising but was not respiring.
D. Both A and B

---

50. Read the given passage.

The land near the equator is *colder* than the land away from it. Near the equator, Sun's rays fall vertically. As the latitude increases, the rays become more and more slanting. Vertical rays spread over a *larger* land area than slanting rays. Also, they pass through a *thicker* layer of the atmosphere which absorbs a large part of their heat. Hence, the land near the equator gets heated up *lesser* by the sun than the land away from it, in a given time.

Some of the words have been italicised in the given passage. Select the incorrect statement regarding these.

A. The words *colder* and *lesser* need not to be replaced as they are correctly mentioned.
B. *Larger* should be replaced by smaller.
C. *Thicker* should be replaced by thinner.
D. None of these

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set A

Year 2016

1. Which of the following figures do not satisfy the same condition of placement of dots as in Fig. (X)?

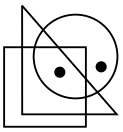
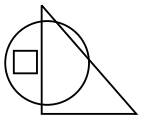
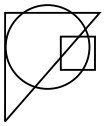
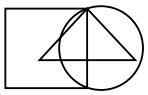


Fig. (X)

A. 

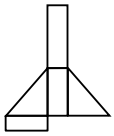
B. 

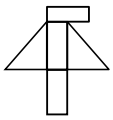
C. 

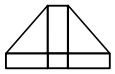
D. 

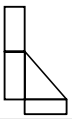
2. Which of the following is the net of the given Fig. (X)?

Fig. (X)

A. 

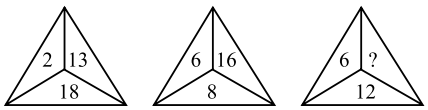
B. 

C. 

D. 

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

A. 16
B. 18
C. 10
D. 14



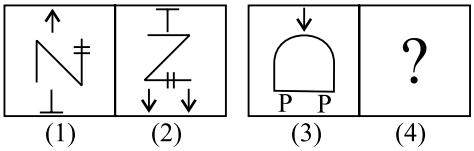
4. Read the following information carefully.
'A@B' means 'A is added to B'.
'A∗B' means 'A is multiplied by B'.
'A#B' means 'A is divided by B'.
'A$B' means 'B is subtracted from A'.
Total age of 12 boys is 'X' and the total age of 13 girls is 'Y'. What is the average age (A) of all the boys and girls together?

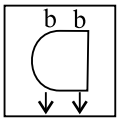
A. A = (X@Y) # 25
B. A = (X$Y) # 25
C. A = (X@Y) ∗ 25
D. None of these

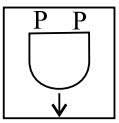
5. There are 8 friends A, B, C, D, E, F, G and H seated in a circle facing the centre. AC, DG, HE and FB are seated adjacent to each other. A is also seated adjacent to H. B is second to the right of H. E is third to the right of C.
What is C's position with reference to F?

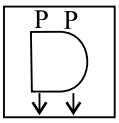
A. 5th to the right
B. 4th to the left
C. 4th to the right
D. 3rd to the right

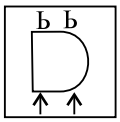
6. There is a certain relationship between figures (1) and (2). Establish the same relationship between figures (3) and (4) by selecting a suitable figure from the options that would replace the (?) in Fig. (4).



A. 

B. 

C. 

D. 

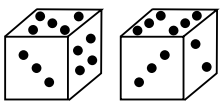
7. If the first and the second digits of each of the following numbers are interchanged, then which number will be the smallest?

358 426 853 674 592

A. 358
B. 426
C. 853
D. 674

8. Two positions of a dice are shown below. If the face with 1 dot is at the bottom, then the number of dots on the top face is

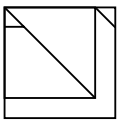
A. 2
B. 3
C. 4
D. 5

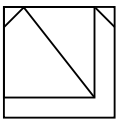


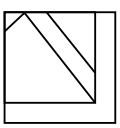
9. In a certain code language, the word FIENDISH is written as DFHNSEII. How will the word HESITATE be written in that language?

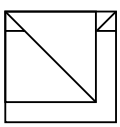
A. HSTTEEAI
B. HTTSAEEI
C. HSTTAEEI
D. HSTTIEEA

10. Select a figure from the options, which when placed in the blank space of Fig. (X) would complete the pattern.

A. 

B. 

C. 

D. 

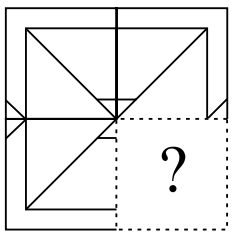
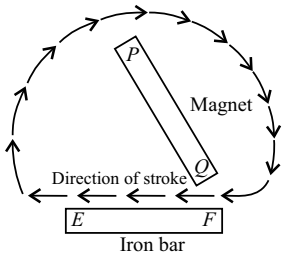


Fig. (X)

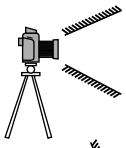
11. Sagar wants to magnetise an iron bar *EF* by the stroking method. The given figure shows the direction of stroke.

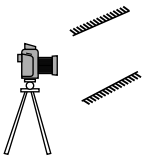


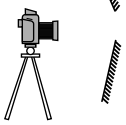
Which of the following is a possible set of polarities for the given arrangement?

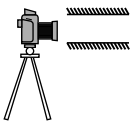
	P	*Q*	*E*	*F*
A.	North	South	South	South
B.	North	South	North	North
C.	South	North	South	North
D.	South	North	North	South

12. A photographer wishes to take pictures without being noticed. He sets up two plane mirrors together with his camera. Which arrangement of mirrors will allow the photographer to take pictures of someone behind the camera?

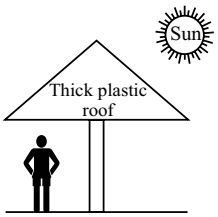
A. 

B. 

C. 

D. 

13. The diagram shows a man standing under a shelter on a sunny day. Given that the man feels hot, which of the following shows the processes of how thermal energy from the Sun reaches the man?



A. Radiation → Conduction → Radiation
B. Radiation → Conduction → Convection
C. Radiation → Convection → Radiation
D. Radiation → Convection → Convection

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

Statement 1 : It is difficult to ride a bicycle against the direction of wind.

Statement 2 : High speed winds are accompanied by increased air pressure.

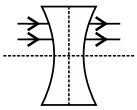
A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Both statements 1 and 2 are false.

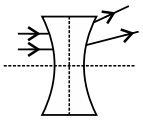
15. Match Column-I with Column-II and select the correct option.

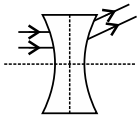
	Column-I		**Column-II**
(a)	Railway engine	(i)	Quintal
(b)	Packet of chilli powder	(ii)	kg
(c)	Sack of wheat	(iii)	mg
(d)	Huge bag of sand	(iv)	g
(e)	Aspirin tablet	(v)	Metric ton

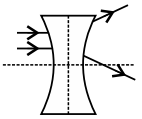
A. (a) - (v), (b) - (iv), (c) - (i), (d) - (ii), (e) - (iii)
B. (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv), (e) - (v)
C. (a) - (ii), (b) - (iv), (c) - (v), (d) - (iii), (e) - (i)
D. (a) - (iii), (b) - (ii), (c) - (iv), (d) - (v), (e) - (i)

16. Two parallel rays of light strike a concave lens. Which of the following correctly shows the passage of the rays after passing through the lens?

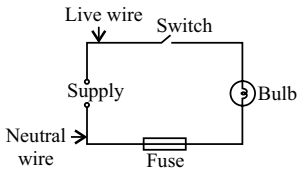
A. 

B. 

C. 

D. 

17. Misha, a class VII student suggests the given circuit setup. Her teacher said that this circuit is unsafe because



A. The switch is wrongly connected
B. The fuse is wrongly connected
C. The bulb is fused
D. Live wire and neutral wire have been interchanged.

18. Three liquids with their respective boiling and freezing points are shown in the given table.

Liquids	Freezing point	Boiling point
Mercury	–39°C	357°C
Alcohol	–112°C	78°C
Pentane	–180°C	36°C

A thermometer that can measure both –50°C and 38°C should be filled with _____.

A. Mercury only B. Alcohol only
C. Pentane only
D. Either alcohol or pentane

19. Solve the following riddle by identifying *X*, *Y*, *Z*.

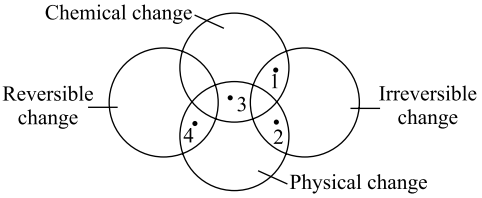
X : I am present in a closed circuit only.
Y : I am a source of energy available in different shapes and sizes.
Z : I am a device used for making and breaking the electric circuit.

	X	*Y*	*Z*
A.	Electric current	Electric switch	Electric cell
B.	Electric switch	Electric cell	Electric current
C.	Electric current	Electric cell	Electric switch
D.	Electric cell	Electric current	Electric switch

20. Two identical balls are released at the same time from a building of height 85 m, one from the top while the other from half way up.
Which of the following quantities is same for both balls?
A. Time of travel B. Final speed
C. Acceleration D. Total displacement

21. Which of the following statements is/are correct?
I. Coffee is bitter in taste hence, it is basic in nature.
II. All mineral acids are strong acids.
III. Phenolphthalein is a synthetic indicator.
IV. In neutralisation reaction, heat is always evolved.
V. If the soil is too basic, organic matter is added to it.
A. III, IV and V B. I, III and V
C. I, III and IV D. III only

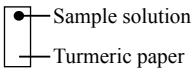
22. Study the given Venn diagram :



Points 1, 2, 3 and 4 represent

	1	2	3	4
A.	Folding a paper to make boat	Burning of a cracker	A spinning top	Germination of seeds
B.	Growth of a plant	Cutting of a tree	Burning of cooking gas	Melting of ice
C.	Setting of milk to form curd	Melting of ice	Inflation of tyre	Tearing a paper into pieces
D.	Change of seasons	Rising and setting of sun	Bursting of a balloon	Burning of a candle

23. Smita took a spoon of turmeric powder and made a paste by adding little water to it. She cut thin stripes of a paper and applied this paste on them. After drying she put few drops of given sample solutions (i)-(iv) on these strips. What would be the changes in the colour she observed?



(i) *Amla* juice
(ii) Lime water
(iii) Common salt solution
(iv) Baking soda solution
A. (i)-Yellow, (ii)-Red, (iii)-Yellow, (iv)-Red
B. (i)-Red, (ii)-Yellow, (iii)-Yellow, (iv)-Red
C. (i)-Red, (ii)-Red, (iii)-Yellow, (iv)-Yellow
D. (i)-Yellow, (ii)-Yellow, (iii)-Red, (iv)-Red

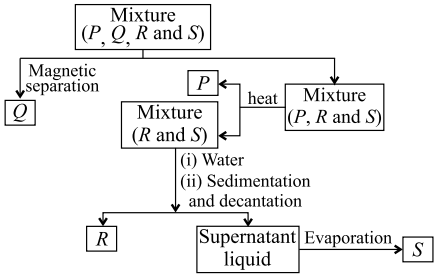
24. The properties of substances *X*, *Y* and *Z* are given as :
X : Gas, transparent, colourless
Y : Solid, translucent, insulator
Z : Liquid, opaque, edible
X, *Y* and *Z* are respectively
A. Water vapour, petrol and mercury
B. Fog, frosted glass and muddy water
C. Oxygen, butter paper and milk
D. Chlorine, glass jar and water.

25. Match the given chemical reactions with the products listed in the box and select the correct option from the given codes.

(i)-CaO; (ii)-$Mg(OH)_2$; (iii)-NO_2 (iv)-Cu (v)-$MgCl_2$; (vi)-O_2; (vii)-Fe_2O_3; (viii)-$CaCO_3$

P. Mixing magnesium oxide with water
Q. Brown deposit on iron nail kept in copper sulphate solution
R. Carbon dioxide is passed through lime water
S. Absorption of ultraviolet radiations by ozone.
A. P-(v), Q-(vii), R-(i), S-(vi)
B. P-(iv), Q-(ii), R-(i), S-(iii)
C. P-(ii), Q-(iii), R-(viii), S-(vii)
D. P-(ii), Q-(iv), R-(viii), S-(vi)

26. Study the given flowchart carefully.



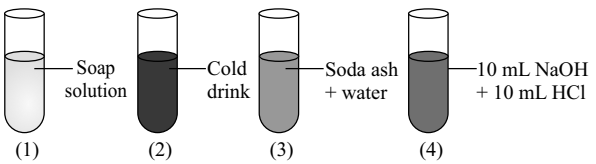
P, *Q*, *R* and *S* are respectively
A. Salt, sawdust, iron dust, camphor
B. Sawdust, iron dust, camphor, salt
C. Iron dust, camphor, sawdust, salt
D. Camphor, iron dust, sawdust, salt.

27. Kunal has classified a few processes as shown in the given table :

S.No.	Processes	Type of change
I.	Sublimation of naphthalene balls	Chemical
II.	Heating of sodium with chlorine gas	Physical
III.	Mixing sodium hydroxide with copper sulphate solution	Chemical
IV.	Expansion of bimetallic strip	Chemical
V.	Extraction of a metal by electrolysis	Physical

The processes which are classified incorrectly are
A. II, IV and V only B. III and V only
C. I, II, IV and V only D. All of these.

28. During the science activity, class teacher arranged the test tubes as shown in the figure and asked students to predict the effect of various indicators on the given solutions.



Which of the following statements are correct?

I. Turmeric solution will turn red in test tubes 1 and 4.

II. Methyl orange will turn yellow in test tubes 1 and 3.

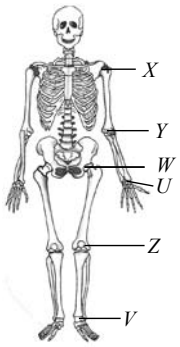
III. China rose indicator will turn dark pink in test tube 2.

IV. Blue litmus solution will turn red in test tubes 1 and 4.

A. I and IV only B. I, II and IV only

C. II and III only D. None of these

29. Refer to the given figure and select the correct option.



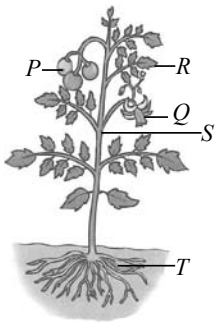
A. Joint *X* is similar to joint *Y* whereas joint *W* is similar to joint *Z*.

B. Joints *U* and *V* are fixed joints where bones do not show movement.

C. Joints *Y* and *Z* allow movement in only one plane, *i.e.*, either back and forth or up and down.

D. None of these

30. Refer to the given figure and select the correct option regarding *P*, *Q*, *R*, *S* and *T*.



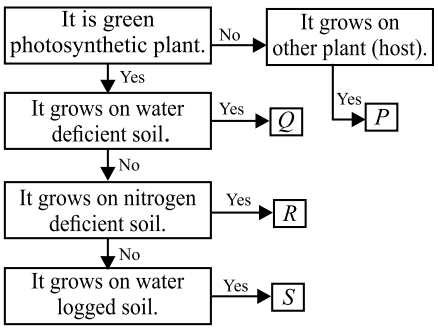
A. In pea, *R* is modified into tendril to give support whereas in Venus flytrap, *S* is modified to catch insects.

B. *R* is modified into spines to prevent water loss whereas *S* performs photosynthesis in *Opuntia*.

C. *T* is modified to store food in turnip and ginger whereas outer covering of *P* is edible in cardamom.

D. *Q* is modified to store food in cabbage, broccoli and lettuce.

31. Refer to the given flow chart and select the correct option regarding *P*, *Q*, *R* and *S*.



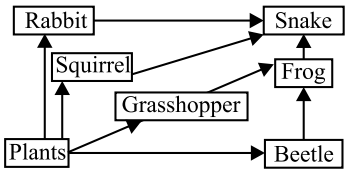
A. Plant *P* derives nutrition from the host plant with the help of haustoria and possesses hygroscopic roots which absorb moisture directly from atmosphere.

B. Plant *Q* possesses broad thin leaves with superficial stomata.

C. Plant *R* possesses special leaf modifications to catch and digest insects.

D. Plant *S* possesses stilt roots which help in aeration.

32. Refer to the given food web.



Which of the following holds true regarding this?

A. There are four primary consumers and one secondary consumer in the given food web.

B. There are two herbivores and two carnivores in the given food web.

C. Snake is serving as both primary and secondary consumer in this food web.

D. If grasshopper and beetle population is removed from this community then frog population will be affected negatively.

33. Two friends Rohan and Ravi visited a general physician for their respective diseases. Doctor examined them and prepared a chart as shown below to keep a record of their illness.

Name of the patient	Symptoms of disease	Treatment
Rohan	Spongy and bleeding gums	Intake of citrus fruits and amla
Ravi	Body fatigue, paleness of face and nails	Intake of green leafy vegetables (like spinach) and red meat

Refer to the given chart and select the correct option regarding this.

A. Rohan is suffering from deficiency of a fat soluble vitamin which helps in formation of bones and teeth.

B. Ravi is suffering from deficiency of a mineral that is required for formation of haemoglobin that carries oxygen from lungs to body cells.

C. Rohan is suffering from deficiency of a mineral that also increases immunity against various diseases.

D. None of these

34. Read the following statements carefully and select the option which correctly identifies the true (T) and false (F) statements.

(i) Synthetic fibres are the fibres that are made from chemicals.

(ii) Cashmere wool is obtained from cashmere rabbit.

(iii) Anthrax is an occupational disease caused by a bacteria *Bacillus anthracis*.

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

35. Farheen soaked some bean seeds in water overnight. Next morning she drained the water and kept the seeds moist till they started germinating. She boiled half of the seeds and then kept the germinating seeds in one thermos flask *X* and the boiled seeds in another thermos flask *Y*. She covered the mouth of both flasks with moist cotton wool. Then she inserted thermometers in both flasks and left them. What would be her observation after four hours?

A. Temperature of flask *X* increases because it has photosynthesising seeds.
B. Temperature of flask *X* increases because it has respiring seeds.
C. Temperature of flask *Y* increases because it has boiled seeds.
D. Both B and C

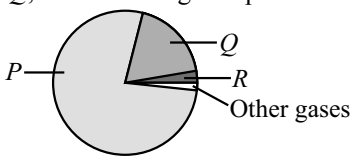
36. Refer to the given dichotomous key.

I. (a) Fibre obtained from natural resources – Go to II
(b) Fibre obtained from chemicals – [*P*]
II. (a) Plant fibre – Go to III
(b) Animal fibre – Go to IV
III. (a) Fibre obtained from seeds of plants – [*Q*]
(b) Fibre obtained from stem of plants – [*R*]
IV. (a) Fibre obtained from mammal – [*S*]
(b) Fibre obtained from insect – [*T*]

Which of the following is incorrect regarding *P*, *Q*, *R*, *S* and *T*?

A. *P* is a petroleum based fibre which does not absorb water readily.
B. Both fibres *Q* and *S* are obtained from their source organisms without harming them.
C. *Q* is separated from seeds by retting whereas *R* is separated from stems by ginning.
D. *S* can be obtained from the same animal again and again whereas *T* can be obtained from an animal only once in its lifetime.

37. The given diagram shows percentage composition of gases *P*, *Q*, *R* and other gases present in air.

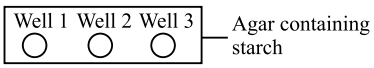


Which of the following statements is correct regarding gases *P*, *Q* and *R*?

(i) *P* can be fixed in soil by certain bacteria present in roots of leguminous plants.
(ii) *P* supports combustion whereas *Q* and *R* help in extinguishing fire.
(iii) Plants and animals release *R* in respiration whereas plants use *Q* in photosynthesis.
(iv) *R* entraps sun's heat and makes earth warm and hospitable.

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

38. Digestive juices were collected from three different regions of the alimentary canal. Drops of these juices were added to wells made in an agar of starch as shown below.



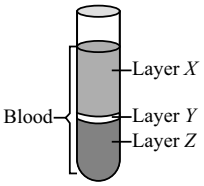
After an hour, the wells were rinsed with distilled water and flooded with iodine solution. The results are shown below.

Well	1	2	3
Colour of iodine solution	Blue-black	Yellow - brown	Yellow - brown

Which of the following correctly identifies the regions of the alimentary canal from which the three digestive juices were obtained?

	Well 1	**Well 2**	**Well 3**
A.	Mouth cavity	Small intestine	Stomach
B.	Mouth cavity	Stomach	Small intestine
C.	Small intestine	Mouth cavity	Stomach
D.	Stomach	Mouth cavity	Small intestine

39. Refer to the given diagram which shows a test tube containing blood with its components arranged in layers (*X*, *Y* and *Z*) after it had been stirred thoroughly for 5 minutes in a process known as centrifugation.



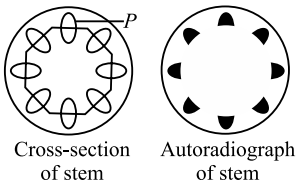
(In centrifugation, the heavier components sink to the bottom of the test tube while the lighter components rise towards the surface).
Now, select the correct statement regarding layers *X*, *Y* and *Z*.

A. Layer *X* represents blood plasma, layer *Y* is chiefly constituted by red blood corpuscles whereas layer *Z* contains blood platelets.
B. Layer *Y* would be absent or greatly reduced in case of blood sample obtained from person whose blood does not clot easily.
C. Layer *Z* is chiefly composed of water, enzymes, hormones etc.
D. Layer *X* possesses haemoglobin responsible for oxygen transport in human body.

40. Shruti planted many plants belonging to two separate species *X* and *Y* in her garden. She watered them regularly and took proper care of them. Plants of both species flowered. After sometime Shruti noticed that only plants belonging to species *X* yielded fruits whereas fruit setting was absent in plants of species *Y*. What could be the probable reason for this?

A. Plants of species *X* are wind pollinated but plants of species *Y* are insect pollinated.
B. Species *X* is dioecious whereas species *Y* is monoecious.
C. Plants of species *Y* present in Shruti's garden are dioecious male plants.
D. Plants of species *X* bear only unisexual female flowers whereas plants of species *Y* bear bisexual flowers.

41. The leaves of a green bean plant were exposed to carbon dioxide containing the radioactive isotope of carbon ^{14}C for few hours in sunlight.



A section of the plant's stem was then immediately obtained and placed on an X-ray film that blackens where exposed to radioactivity. The following diagrams show the cross-section of the stem, and the resulting autoradiograph. Why is structure *P* shown radioactive?

A. *P* transported radioactive carbohydrates from leaves to other plant parts.
B. Radioactive carbon dioxide gets dissolved in cell sap and is transported along with water and minerals by structure *P*.
C. The radioactive carbon is incorporated only in the tissues constituting structure *P*.
D. None of these

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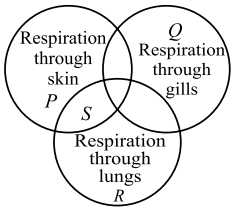
42. Refer to the given Venn diagram and identify *P*, *Q*, *R* and *S*.



A. *P* – *Paramecium*, *Q* – *Scoliodon*, *R* – Spiny ant eater, *S* – Lung fish
B. *P* – Lion tailed macaque, *Q* – Salmon, *R* – Dolphin, *S* – Platypus
C. *P* – Earthworm, *Q* – Rohu, *R* – Blue whale, *S* – Frog
D. *P* – *Amoeba*, *Q* – Tadpole, *R* – Trout, *S* – Snake

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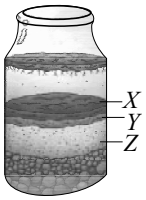
43. A handful of soil was mixed in water and left in a jar for some time. Different components of soil got segregated and formed layers, as shown in the given figure.



Select the correct option regarding layers *X*, *Y* and *Z*.

A. Soil sample having high amount of *X* than *Y* and *Z* is best suited for maize cultivation.
B. Soil sample having almost same amount of *Y* and *Z* and comparatively much less amount of *X* has highest percolation rate and water absorbing capacity.
C. Soil containing more amount of *Z* and very little *X* and *Y* is prominent in areas where Kangaroo rat and *Acacia* are commonly found.
D. The space between particles is very large in *X* however particles are small sized and compactly arranged in *Y* and *Z*.

---

44. Read the given paragraph with few blanks.

(i) body of birds reduces resistance offered by wind. Their (ii) are modified into wings which help them in flight. Birds have (iii) bones which make their body light. Birds are (iv) and maintain constant body temperature. (v) are attached to their lungs which serve as reservoirs of air. Birds maintain equilibrium in flight due to well developed (vi) of brain.

Select the option that correctly fills any 3 of these blanks.

A. (i) Spindle shaped, (ii) Hindlimbs, (vi) Cerebrum
B. (ii) Forelimbs, (iv) Homeothermic, (vi) – Cerebellum
C. (i) Radially symmetrical, (iii) Pneumatic, (v) Air sacs
D. (iv) Poikilothermic, (v) Air sacs, (vi) Cerebrum

---

45. Read the given paragraph.

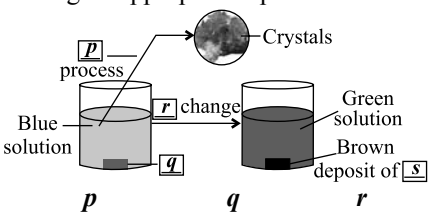
X, *Y* and *Z* are three methods of waste management. *X* requires action of biological agents whereas *Y* and *Z* are chemical processes. Both *X* and *Y* reduce the waste volume whereas *Z* makes the waste reusable.

Which of the following is incorrect regarding *X*, *Y* and *Z*?

A. *X* enriches the soil with nutrients and helps in recycling of matter between living organisms and their environment.
B. *Y* generates gases and heat energy and is best suited for disposing toxic waste.
C. *Z* increases the demand and supply of fresh raw material and causes air and water pollution.
D. Saprophytes and detritivores play a major role in *X*.

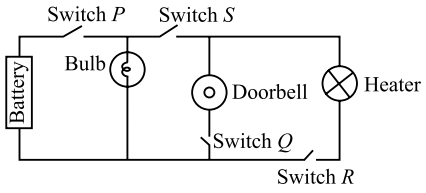
ACHIEVERS SECTION

46. Observe the given figure carefully and fill in the blanks by choosing an appropriate option.



	p	*q*	*r*	*s*
A.	Crystallisation	Iron	Chemical, reversible	Iron oxide
B.	Sublimation	Zinc	Physical, irreversible	Zinc oxide
C.	Melting	Copper	Physical, reversible	Copper oxide
D.	Crystallisation	Iron	Chemical, irreversible	Copper

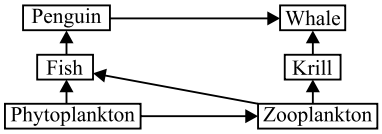
47. Which of the following statements is correct for the given circuit diagram?



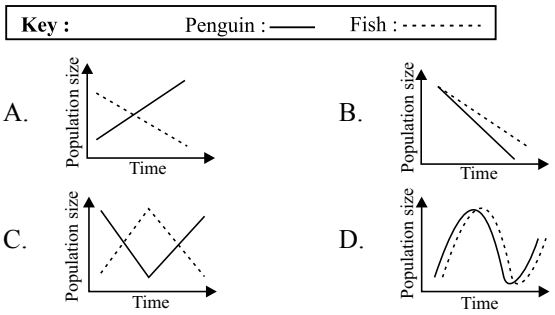
A. To convert the electrical energy into heat energy, only switch *R* should be closed.
B. Minimum number of switches needed to be closed for conversion of electrical energy to sound energy is two.
C. To convert the electrical energy to light energy, only switches *S* and *Q* should be closed.

D. If electrical energy is being converted to sound energy and heat energy, then conversion to light energy is also taking place.

48. Refer to the given food web.



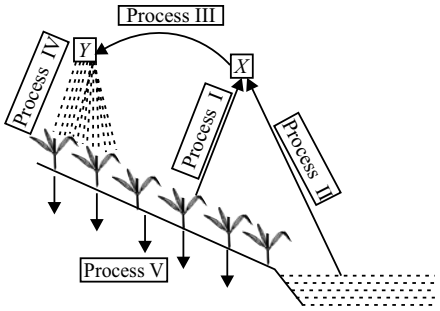
Which of the following graphs best illustrates changes in fish and penguin population over time if whale population is removed from this community?



49. Read the given paragraph where few words have been italicised.
Buccal cavity of humans contains *two* pairs of salivary glands which secrete digestive juices that help in digestion of *proteins* present in food. From here food enters stomach where digestion of mainly *fats* takes place. As this semi-digested food enters small intestine complete digestion of food occurs. Small intestine receives bile juice from *pancreas* which *digests* fats. Most absorption of water occurs in *large* intestine.
Select the correct option regarding this.

A. *Two* should be replaced by *four* whereas *proteins* should not be replaced as it is correctly mentioned.
B. *Fats* should be replaced by *carbohydrates* and *pancreas* should be replaced by *liver*.
C. *Digests* should be replaced by *emulsifies*.
D. *Large* should be replaced by *small*.

50. Refer to the given diagram showing a natural cyclic process.



Which of the following holds true regarding it?

A. Deforestation will decelerate process V.
B. Process I occurs at a high rate in a rainforest and is absent in deserts whereas process III is involved in dew formation.
C. The physical state of water at *X* is liquid and that at *Y* is gaseous.
D. Both processes II and IV involve conversion of one physical state of water into another.

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

Set B

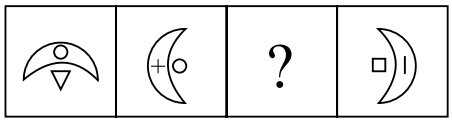
Year 2016

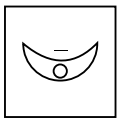
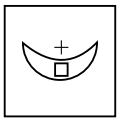
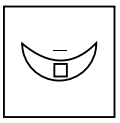
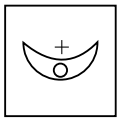
1. Pointing to a photograph, Mini said, "She is the mother of my only brother's uncle's son." How is Mini related to the person in the photograph?

   A. Aunt
   B. Niece
   C. Mother
   D. Daughter

2. Select a figure from the options which will substitute the (?) so that a series is formed by the Problem Figures.

   Problem Figures



   A. 
   B. 
   C. 
   D. 

3. How many such 4's are there in the following sequence that the sum of the immediately following two digits is greater than the sum of the immediately preceding two digits?

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

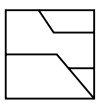
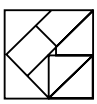
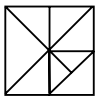
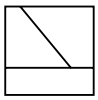
   A. 7
   B. 6
   C. 5
   D. 4

4. If it is possible to make a meaningful word with the first, fourth, fifth and eighth letters of the word HYPOTHESIS which of the following will be the third letter of that word ? If more than one such word can be formed, give 'X' as the answer. If no such word can be formed, give 'M' as the answer.

   A. M
   B. X
   C. S
   D. T

5. In which of the following options, Fig. (X) is exactly embedded as one of its part?

   Fig. (X)

   A. 
   B. 
   C. 
   D. 

6. Ahika is standing to the North of Sumit. Priyanka is standing to East of Ahika. Puneet is to the West of Sumit. What is the position of Puneet with respect to Priyanka?

   A. West
   B. South-West
   C. South
   D. North-West

7. Select the correct water image of the given combination of letters and numbers.

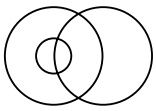
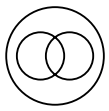
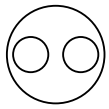
   5N6OMAT

   A. ƧИ9OWAT
   B. ƧϱИOWAT
   C. ƧϱИWOAT
   D. ƧAWOИϱT

8. Three of the following four groups of letters are alike in some away while one is different. Find out which one is different.

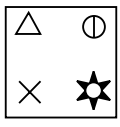
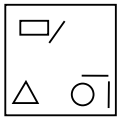
   A. AGDKB
   B. CIFMD
   C. EKHOF
   D. JPMSK

9. Which of the following Venn diagrams correctly represents the relationship amongst "Rivers, Oceans, Water sources"?

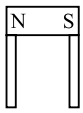
   A. 
   B. 
   C. 
   D. 

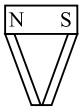
10. Select the option in which only specified components of the Fig. (X) are found.

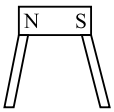
   Fig. (X)

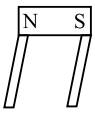
   A. 
   B. 
   C. 
   D. 

11. Which of the following diagrams best depicts the situation when two long iron rods are placed at the ends of a very short bar magnet?

A. 

B. 

C. 

D. 

12. The end of a cyclone comes quickly if the cyclone moves over
A. Sea B. Lake
C. Land D. Cloud.

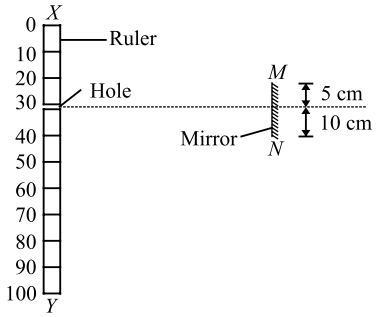
13. Four magnetic materials are used to pick up metallic paper clips after they were taken out from a coil which is connected to a strong direct current. The numbers of paper clips picked up by the four magnetic materials are listed here:

Magnetic material	Number of paper clips picked up
P	0
Q	5
R	10
S	20

Which is the best magnetic material to be used as an electromagnet?
A. *P* B. *Q*
C. *R* D. *S*

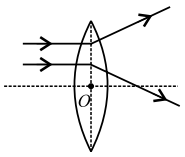
14. Which of the following statements does not illustrate uniform motion?
A. A boy runs 80 m along a straight track at a constant speed.
B. A stone is thrown upwards with a speed of 10 m s^{-1}.
C. A ball moves along a frictionless surface without any external force.
D. An aeroplane flying with a constant speed of 250 m s^{-1} at an altitude of 1000 m.

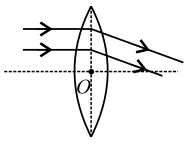
15. The diagram shows a metre ruler *XY* with a small hole drilled at the 30 cm mark. A plane mirror *MN* is placed in front of the ruler and is parallel to it.

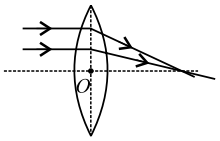


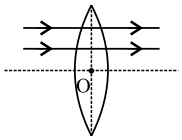
If an observer peeps through the hole at the mirror, the extent to which he can see the metre ruler is between the_____.
A. 0 cm and 90 cm mark
B. 10 cm and 70 cm mark
C. 20 cm and 50 cm mark
D. 15 cm and 60 cm mark

16. Two parallel rays of light strike a convex lens. Which of the following correctly shows the passage of the rays after passing through the lens?

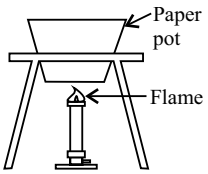
A. 

B. 

C. 

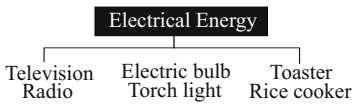
D. 

17. Some steamboat restaurants use paper pots for their customers to heat the food themselves. What is the reason for the paper not to catch fire when in contact with the flame?



(i) The paper is thin and therefore heat is conducted quickly to the water in the paper pot.
(ii) Water has a boiling point lower than the burning temperature of the paper.
(iii) The paper is thick enough to withstand the high temperature of the flame.
A. (i) and (ii) only B. (i) and (iii) only
C. (ii) and (iii) only D. (i), (ii) and (iii)

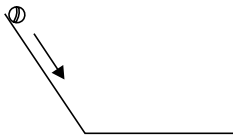
18. Study the classification carefully and select the correct option for *X*, *Y* and *Z*.



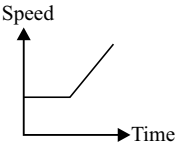
	X	***Y***	***Z***
A.	Refrigerator	Clock	Microwave
B.	Music system	Washing machine	Heater
C.	Walkman	Table lamp	Electric kettle
D.	Air-conditioner	Heater	Hair drier

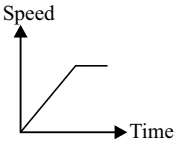
19. The length of mercury thread in a mercury thermometer is 2 mm at the ice point and 26 mm at the boiling point of water. What will be the length of mercury thread in this thermometer if it is used to measure a temperature of 75°C?
A. 18 mm B. 20 mm
C. 22 mm D. 24 mm

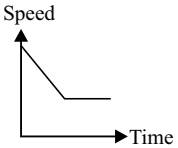
20. The given diagram shows a ball released from the top of a smooth ramp, which reaches a flat and smooth horizontal surface connected to the ramp.

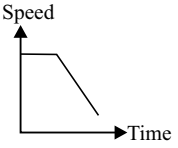


Which of the following speed-time graphs best represents the motion of this ball?

A. 

B. 

C. 

D. 

21. Ms. Kritika, a science teacher demonstrated an activity in the class. She burnt a thin strip of magnesium and collected the powdery ash in a China dish. Then she mixed some water and tested the mixture with various indicators.

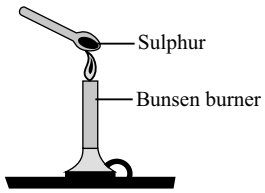
Which of the following observations are correct?

I. The colour of China rose indicator changed to green.
II. The colour of turmeric paper changed to blue.
III. Red litmus changed to blue.
IV. Colour of methyl orange changed to yellow.

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

22. The given diagram shows burning of sulphur :

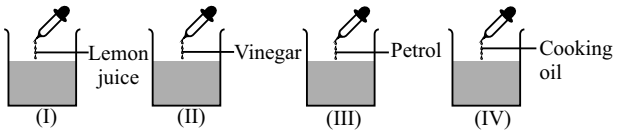
After heating sulphur for few minutes, it melts (process I) and then vaporises (process II). After this, vapour ignite and burn with oxygen to form sulphur dioxide (process III).



Identify the types of changes taking place in these processes.

A. Processes I and III are chemical changes while II is a physical change.
B. Processes II and III are chemical changes while I is a physical change.
C. Process III is a chemical change while processes I and II are physical changes.
D. All are chemical changes.

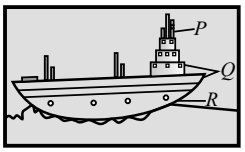
23. The following activity was performed to check the solubility of various liquids in water :



Which of the following observations is correct?

A. Two separate layers will be formed in beakers I and II and liquids are completely miscible.
B. Components will mix well in beakers III and IV as they are completely miscible.
C. Vinegar will disappear completely in beaker II as it is a miscible liquid.
D. Cooking oil will form a separate layer below water in beaker IV.

24. Which portion of the ship will rust the fastest?



A. *P*
B. *Q*
C. *R*
D. *P*, *Q* and *R* will rust equally.

25. The given table shows the properties of four substances *K*, *L*, *M* and *N* :

Substance	Colour	Nature	Magnetic	Dissolves in water
K	White	Salty	No	Yes
L	Blue	Sweet	No	No
M	White	Sweet	No	Yes
N	Black	Metallic	Yes	No

Which two substances would be most difficult to separate when mixed in water?

A. *K* and *L*
B. *K* and *M*
C. *L* and *M*
D. *M* and *N*

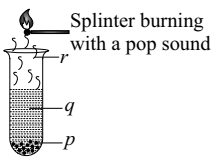
26. Consider the following statements :

I. Baking soda is an acidic salt whereas common salt is a basic salt.
II. The water extract of spinach does not change the colour of red litmus solution.
III. Organic matter neutralises the acidic nature of the soil.
IV. Lime water is acidic in nature.

The incorrect statement(s) is/are

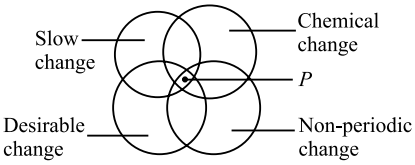
A. I, II and IV only
B. II, III and IV only
C. I, III and IV only
D. II only.

27. Observe the given figure carefully and identify the substances marked as *p*, *q* and *r*.



	p	*q*	*r*
A.	Baking soda	Vinegar	Carbon dioxide
B.	Magnesium	Hydrochloric acid	Chlorine
C.	Calcium carbonate	Hydrochloric acid	Carbon dioxide
D.	Zinc	Hydrochloric acid	Hydrogen

28. Study the given Venn diagram :



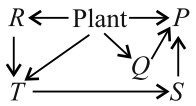
Centre point '*P*' represents

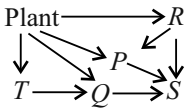
A. Rusting of iron
B. Eruption of volcanoes
C. Ripening of a fruit
D. Burning of cooking gas.

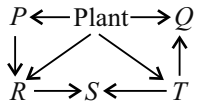
29. The given table classifies five animals *P*, *Q*, *R*, *S* and *T* according to their feeding habits. These animals live in the same habitat.

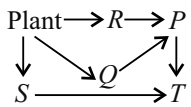
Carnivore	Herbivore	Omnivore
S	*R*	*P*
	T	*Q*

Which of the following shows their correct interlinking with respect to their feeding habits?

A. 

B. 

C. 

D. 

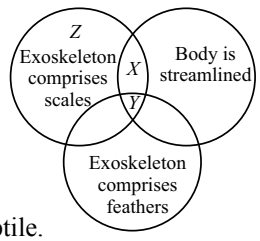
30. The given table shows some observations of food test experiments.

	Food sample / Test	*W*	*X*	*Y*	*Z*
(i)	Iodine test	Brown	Brown	Bluish-black	Brown
(ii)	Benedict's test	Orange	Blue	Blue	Blue
(iii)	Copper sulphate + Caustic soda test	Blue	Purple	Blue	Purple
(iv)	Ethanol test	Colourless	Emulsion	Colourless	Colourless

Which of the following correctly identifies *W*, *X*, *Y* and *Z*?

A. *W* – Sugar, *X* – Egg, *Y* – Potato, *Z* – Soyabean
B. *W* – Pulses, *X* – Cabbage, *Y* – Butter, *Z* – Jam
C. *W* – Milk, *X* – Orange, *Y* – Peanuts, *Z* – Paneer
D. *W* – Cheese, *X* – Potato, *Y* – Honey, *Z* – Meat

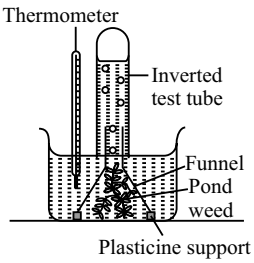
31. Refer to the given Venn diagram and select the correct statements regarding *X*, *Y* and *Z*.



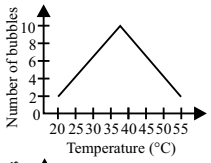
(i) *X* could be *Scoliodon*, *Y* could be pigeon and *Z* could be tortoise.
(ii) *Y* is warm blooded whereas *X* and *Z* are cold blooded animals.
(iii) *X* could be a fish or a reptile.
(iv) *Y* possesses hollow bones and air sacs.
(v) *X* has two chambered heart, *Y* has three chambered heart and *Z* has four chambered heart.

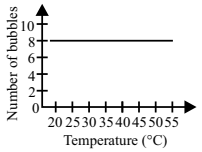
A. (i) and (iv) only
B. (i), (ii), (iii) and (iv) only
C. (ii), (iv) and (v) only
D. (i), (ii) and (v) only

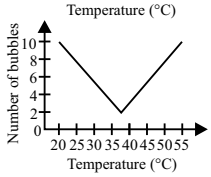
32. Divya set up an experiment in an open field as shown here to study how temperature affects the rate of photosynthesis. She left the apparatus in field from 7 am in the morning till 1 pm in afternoon and tabulated her observations which were later plotted on a graph.

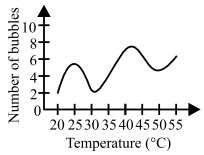


Which of the following graphs shows the result of her experiment?

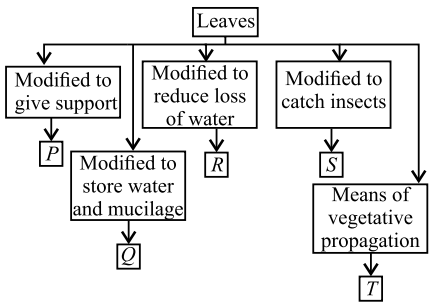
A. 

B. 

C. 

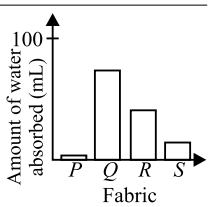
D. 

33. Refer to the given flow chart and identify *P*, *Q*, *R*, *S* and *T*.



A. *P* - Pea, *Q* - *Opuntia*, *R* - *Aloe*, *S* - *Utricularia*, *T* - Lettuce
B. *P* - Grapevine, *Q* - *Acacia*, *R* - *Coleus*, *S* - *Dionaea*, *T* - Passion flower
C. *P* - *Gloriosa*, *Q* - *Aloe*, *R* - *Opuntia*, *S* - *Nepenthes*, *T* - *Bryophyllum*
D. *P* - Bottle gourd, *Q* - Cactus, *R* - *Asparagus*, *S* - *Drosera*, *T* - *Coleus*

34. The given graph shows the amount of water absorbed by four fabrics *P*, *Q*, *R* and *S* of same size when put in four separate beakers each containing 100 mL of water.



Identify *P*, *Q*, *R* and *S* and select the incorrect option regarding them.

A. *R* can be worn close to skin because static electricity does not build up readily.
B. Fibres of *Q* consist of keratin protein, fibres of *S* consist of fibroin protein, fibres of *R* are cellulosic in nature whereas fibres of *P* are obtained from petrochemicals.
C. Fibre of *S* is the strongest natural fibre.
D. Fibres of *P* and *Q* are animal fibres whereas fibres of *R* and *S* are plant fibres.

35. Read the given statements and select the option which correctly fills the blanks in any two of these statements.

(i) *Paramecium* has stiff hair-like structures called _____ all over its body, which are used for _____.

(ii) *Hydra* has a number of _____ around its mouth, that entangle small aquatic animals and kill them with their _____ cells.

(iii) Frog uses its long, sticky_____ to catch insects.

(iv) Mosquito sucks up the blood of animals with its _____.

A. (ii) - Cilia, Absorptive; (iii) - Limb
B. (i) - Tentacles, Ingestion; (iv) - Feeding tube
C. (i) - Cilia, Ingestion; (ii) - Tentacles, Stinging
D. (iii) - Tongue; (iv) - Pseudopodia

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36. Your mother goes to buy a woollen shawl from the market. The shopkeeper takes out a small strand of yarn from the shawl and burns it. It smells like a burning plastic. Will it be a good decision to buy this shawl and why?

A. Yes, as it is a characteristic of pure wool.
B. No, as it is a characteristic of synthetic yarn.
C. Yes, as it is a characteristic of pure silk.
D. No, as it is a characteristic of cotton.

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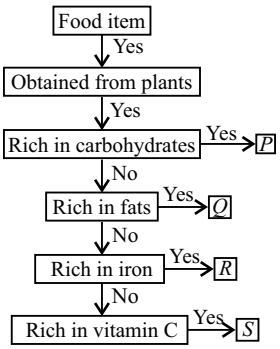
37. Refer to the given flow chart and select the correct option regarding *P*, *Q*, *R* and *S*.



A. *P* could be honey or sugarcane whereas *Q* could be soyabean or maize.
B. *R* should be taken in large quantities by patients suffering from goitre.
C. Deficiency of *S* leads to bleeding gums and swelling of joints.
D. *Q* should be taken in large quantities by patients suffering from kwashiorkor.

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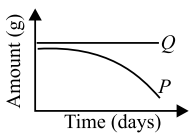
38. The given graph shows the changes in amount of solid wastes *P* and *Q* dumped on an open ground over time.



Select the correct statement regarding *P* and *Q*.

A. *Q* could be vermicomposted or burnt.
B. Hospital waste belonging to category *P* is recycled whereas that belonging to category *Q* is incinerated.
C. Reduction in amount of *P* with time is synchronised with nutrient enrichment of ground soil.
D. *P* could be plastic bag or styrofoam cup whereas *Q* could be vegetable peel or tea leaves.

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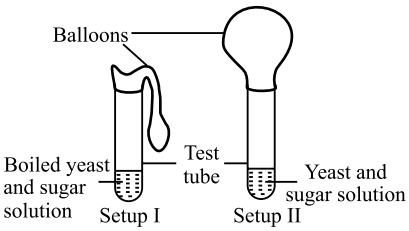
39. Siddhi set up an experiment as shown here to investigate fermentative activity in yeast.



Which of the following holds incorrect regarding the given experiment?

A. The balloon of setup II got inflated due to accumulation of a gas which gives white precipitate when bubbled through calcium hydroxide solution.
B. The balloon in setup I does not inflate as boiled yeast cannot respire.
C. Most of the sugar solution is converted to ethyl alcohol in setup II due to anaerobic respiration of yeast.
D. In setup I, yeast respires only aerobically whereas in setup II yeast undergoes both aerobic and anaerobic respiration.

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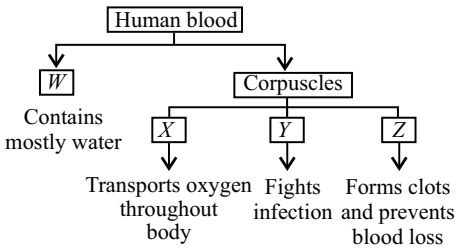
40. Refer to the given flow chart and select the correct option regarding *W*, *X*, *Y* and *Z*.



A. *X* is enucleated, biconvex and contains red pigment haemoglobin.
B. *X* count goes up in case of anaemia whereas *Y* count goes down in case of common cold.
C. *Z* can change its shape and shows amoeboid movements.
D. *X*, *Y* and *Z* remain suspended in *W* along with enzymes, proteins, hormones, etc.

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41. Refer to the given dichotomous key and identify *P*, *Q*, *R* and *S*.

I. (a) It is a flowering plant. - Go to II
(b) It is a non - flowering plant. - Go to III

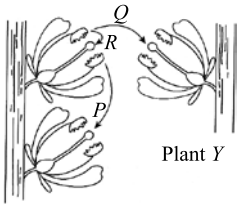
II. (a) Propagates vegetatively by leaves. – [*P*]
(b) Propagates vegetatively by stem. – [*Q*]

III. (a) Reproduces asexually by fragmentation. – [*R*]
(b) Reproduces asexually by spores. – [*S*]

A. *P* - *Bougainvillea*, *Q* - Poppy, *R* - *Sphagnum*, *S* - *Spirulina*

B. *P* - *Begonia*, *Q* - Strawberry, *R* - *Spirogyra*, *S* - *Marchantia*
C. *P* - *Bryophyllum*, *Q* - Passion flower, *R* - *Chrysanthemum*, *S* - *Funaria*
D. *P* - Bottle brush, *Q* - *Dahlia*, *R* - Candytuft, *S* - Jasmine

42. Refer to the given diagram and select the correct option regarding processes *P*, *Q* and *R*.

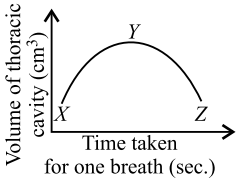


A. Processes *P*, *Q* and *R* introduce genetic variability in the offspring of sexually reproducing plants *X* and *Y*.
B. Wind serves as agent for processes *P* and *Q* in case plants *X* and *Y* belong to genus *Salvia*.
C. Flowers of plant *X* and *Y* need to produce odour and nectar for completion of processes *P* and *Q* if they are rose species.
D. If plants *X* and *Y* are of maize species, then their flowers need to produce sticky and heavy pollens in very small amount for accomplishment of process *Q*.

43. Read the given paragraph.
X is a natural phenomenon which causes soil erosion mostly in hilly areas whereas *Y* is an anthropogenic cause contributing to erosion. However, *Z* is a natural phenomenon contributing to soil formation.
Select the incorrect option regarding *X*, *Y* and *Z*.
A. Lichens are biological agents responsible for phenomenon *Z*.
B. In areas experiencing extremes of temperature, contraction and relaxation of rocks aids in *Z*.
C. Phenomenon *X* can be checked to some extent by terrace and contour farming.
D. *Y* could be afforestation, floods or forest fire.

44. Which of the following is not true regarding the adaptations shown by different animals?
A. Jaguar has spotted skin, which merges well with the speckled shadows of the rainforest floor, making it difficult to be spotted.
B. Toucan uses its long, large bill to reach fruits on weak branches that cannot bear its weight.
C. The lion-tailed macaque has long and sticky tongue which helps it to catch insects.
D. Seals have a thick deposition of fat called blubber that protects them from cold.

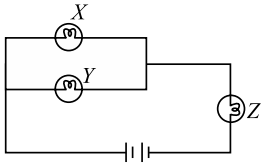
45. The given graph shows changes in the volume of thoracic cavity in a normal human being while breathing.



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.

ACHIEVERS SECTION

46. The diagram shows three identical light bulbs *X*, *Y* and *Z*, connected in a circuit.

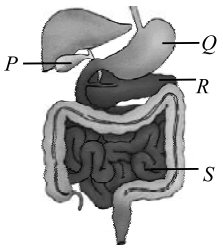


What will happen to the brightness of the bulbs if a similar bulb is connected in series with the bulb *X*?

	X	***Y***	***Z***
A.	Dimmer	Dimmer	Brighter
B.	Dimmer	Brighter	Dimmer
C.	Brighter	Dimmer	Brighter
D.	Brighter	Brighter	Dimmer

47. Some examples of common household items are given :
(a) Soda water (b) Sour milk
(c) Sugar solution (d) Window cleaner
(e) Toothpaste
(f) Common salt solution
Fill in the blanks by choosing an appropriate option.
With solutions I methyl orange changes to red colour, with solutions II China rose indicator changes to green colour while with solutions III red or blue litmus paper do not show any colour change.
A. I – (c), (d); II – (f), (e); III – (a), (b)
B. I – (a), (b); II – (d), (e); III – (c), (f)
C. I – (d), (f); II – (c), (b); III – (a), (e)
D. I – (a), (e); II – (b), (d); III – (c), (f)

48. Refer to the given figure of human digestive system and select the correct statements regarding parts labelled *P*, *Q*, *R* and *S*.



(i) *P* and *R* secrete and pour their digestive enzymes in *Q* for digestion whereas *Q* secretes HCl which kills germs in food.

(ii) Digestion of both carbohydrates and proteins takes place in *Q* whereas digestion of only fats takes place in *S*.

(iii) *Q*, *R* and *S* secrete digestive enzymes but *P* only stores a digestive juice that emulsifies fats.

(iv) *S* does not secrete any digestive enzyme but receives digestive enzymes of *P*, *Q* and *R* for complete digestion of food.

(v) If *P* is removed in a person then he cannot digest fats present in his food.

(vi) *Q* secretes digestive enzymes and mucus whereas *R* secretes digestive enzymes and hormones.

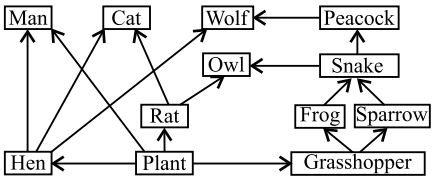
A. (ii), (iv) and (v) only B. (iii) and (vi) only
C . (iv), (v) and (vi) only D. (i), (iii) and (v) only

49. Read the given paragraph where few words have been italicised.

Waste water treatment plant involves physical, chemical and biological processes. First the waste water is made to pass through *bar screen* where *liquid* materials are removed. Then water is allowed to go into *grit* tank where speed of waste water is *increased* so that *light* objects settle at bottom. Then water enters sedimentation tank where sludge sinks slowly at the bottom which is continuously removed by *skimmer*. Water then enters *aeration* tank which contains *anaerobic* bacteria.
Select the correct statement regarding this.

A. *Bar screen* should be replaced by *digester* and *liquid* should be replaced by *solid*.
B. The positions of *grit* and *aeration* should be interchanged.
C. *Increased* and *light* should not be replaced as they are correctly mentioned.
D. *Skimmer* should be replaced by *scraper* and *anaerobic* should be replaced by *aerobic*.

50. Refer to the given food web and select the correct option regarding it.



A. There are 8 food chains in the given food web.
B. There are 4 primary consumers and 3 secondary consumers in this food web.
C. Owl and wolf serve as secondary as well as top consumers in the given food web.
D. There are only two top consumers in the given food web.

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

NSO

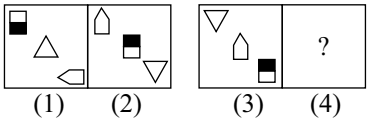
Set A

Year 2017

1. In a certain code language, 'CIRCULAR' is written as 'TCNWETKE'. How will 'COMPUTER' be written in the same language?

   A. THVVWRQF B. TGVWRPRF
   C. TGVVQOQE D. TGVWROQE

2. There is a certain relationship between figures (1) and (2). Establish a similar relationship between figures (3) and (4) by selecting a suitable figure from the options which will replace the (?) in figure (4).



   A.  B. 
   C.  D. 

3. In a row of students, Rahul is 12^{th} from the left end and Shikha is 17^{th} from the right end. If they interchange their positions, Shikha becomes 27^{th} from the right end. How many total students are there in the row?

   A. 38 B. 36
   C. 39 D. 41

4. The sheet of paper shown in Fig. (X) is folded to form a cube. Select the figure from the options that is similar to the cube formed by folding the given sheet.

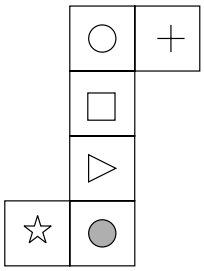
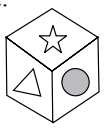
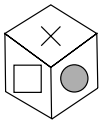
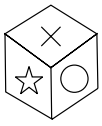
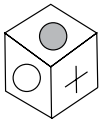


Fig. (X)

   A. 
   B. 
   C. 
   D. 

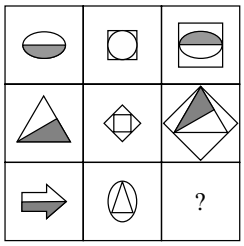
5. If the digits '6' and '4', signs '+' and '×' are interchanged on the left hand side of each option, then which of the following options becomes correct?

   A. $6 + 4 \times 2 = 26$ B. $4 + 6 \times 2 = 12$
   C. $6 \times 4 + 2 = 20$ D. $4 \times 2 + 6 = 8$

6. How many such pairs of letters are there in the word PURPOSEFUL each of which has as many letters between them in the word as there are in the English alphabet?

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

7. Find the missing figure in the given figure matrix.



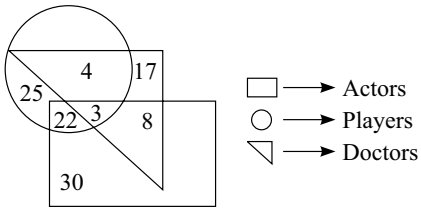
   A. 
   B. 
   C. 
   D. 

8. In which of the following figures, Fig. (X) is exactly embedded as one of its part?


Fig. (X)

   A.  B. 
   C.  D. 

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



   How many doctors are players but not actors?

   A. 3 B. 4
   C. 8 D. 17

10. Which of the following options satisfies the same conditions of placement of dots as in Fig. (X)?

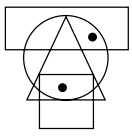
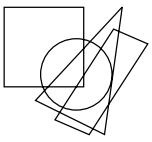
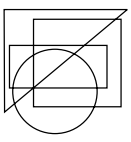
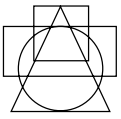
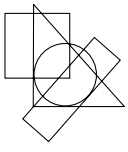
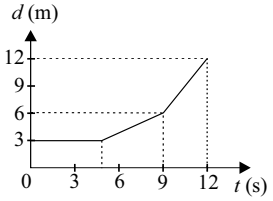


Fig. (X)

   A.  B. 
   C.  D. 

11. The distance-time graph of a motorcycle is shown in the figure. When was the motorcycle travelling at a speed of 2 m s^{-1}?



A. 2.5 s
B. 5.0 s
C. 8.0 s
D. 10.5 s

12. The melting and boiling points of four different substances are shown in the table. The room temperature is 30°C.

Substance	Melting point (°C)	Boiling point (°C)
P	– 114	80
Q	– 210	– 196
R	– 40	360
S	330	1750

Which of the following statements are incorrect about the data given in the table?
(i) Substance *P* is in solid state at room temperature.
(ii) Substance *Q* is in liquid state at room temperature.
(iii) Substance *R* is gas at –150°C and solid at –220°C.
(iv) Substance *S* is in solid state at room temperature.
A. (i) and (ii) only
B. (i), (ii) and (iii) only
C. (iii) and (iv) only
D. (i), (ii), (iii) and (iv)

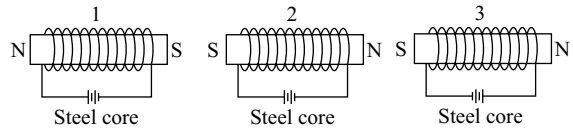
13. Match column I with column II and select the correct option.

	Column I		Column II
P.	Plane mirror	(i)	Used as a magnifying glass
Q.	Concave mirror	(ii)	Can form image of objects spread over a large area
R.	Convex mirror	(iii)	Used by dentists to see enlarged image of teeth
S.	Concave lens	(iv)	The image formed is erect and of the same size as the object
T.	Convex lens	(v)	Is known as diverging lens

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

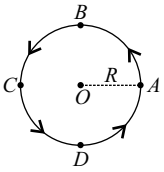
14. Read the given statements and select the correct option.
Statement 1 : The cyclone consists of a high pressure region with low pressure all around.
Statement 2 : The winds tend to blow towards the low pressure region and circulate violently around the centre of cyclone with great speed.
A. Both the statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both the statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Statement 1 is false but statement 2 is true.

15. In which diagram(s) is/are the correct poles of the electromagnet indicated?
(N indicates North pole and S indicates south pole.)



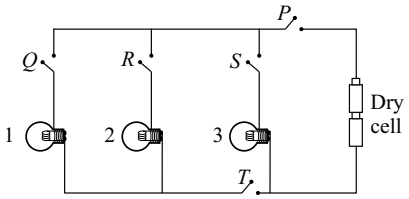
A. 2 only
B. 1 and 2 only
C. 2 and 3 only
D. 1, 2 and 3

16. A particle moves on a circular path of radius *R* as shown in figure. The distance travelled and displacement of the particle from point *A* to point *C* respectively are



A. $\frac{\pi R}{2}, 2R$
B. $\pi R, 2R$
C. $\frac{\pi R}{2}, \frac{\pi R}{2}$
D. $\pi R, \pi R$

17. A circuit diagram is shown here. Which of the switches must be closed so that only bulb 2 lights up ?

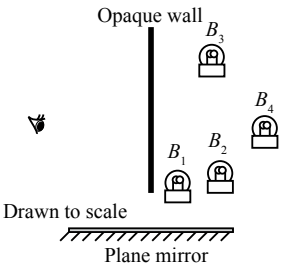


A. *P*, *R* and *T* only
B. *R* and *T* only
C. *R*, *S* and *T* only
D. *P*, *Q*, *R*, *S* and *T*

18. When a light ray is reflected repeatedly by a set of parallel plane mirrors, the intensity of the light ray decreases after some reflections. This is because of
A. Poor reflection from mirrors
B. Absorption of some amount of light by mirrors
C. Scattering of light by mirrors
D. None of these.

19. On holding a stainless steel spoon near our face, we see
A. Our inverted image on outer side of the spoon
B. Our erect image on inner side of the spoon
C. Our inverted image on inner side of the spoon
D. Both B and C are possible.

20. Four light bulbs are concealed from an observer by an opaque wall as shown. Without shifting the positions of the observer and the bulbs, how many bulbs can the observer see from the mirror?



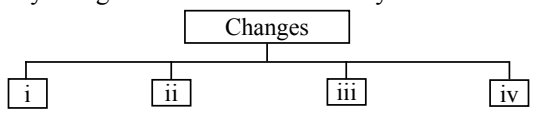
A. 1
B. 2
C. 3
D. 4

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

I. Acids are sour in taste and corrosive in nature.
II. Fruits and vegetables contain inorganic acids.
III. All bases are soluble in water.
IV. Bases produce salts with all metals.
V. Milk of magnesia is an aqueous solution of magnesium carbonate.

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

22. Study the given flow chart carefully.



i	ii	iii	iv
a. Forest fires	a. Low and high tides	a. Sublimation of camphor	a. Bursting of crackers
b. Earthquakes	b. Opening of a morning glory flower	b. Blowing of balloon	b. Breaking of glass

Changes i, ii, iii and iv could be respectively

A. Fast, non-periodic, reversible and chemical
B. Undesirable, periodic, reversible and fast
C. Fast, chemical, irreversible and non-periodic
D. Undesirable, reversible, chemical and irreversible.

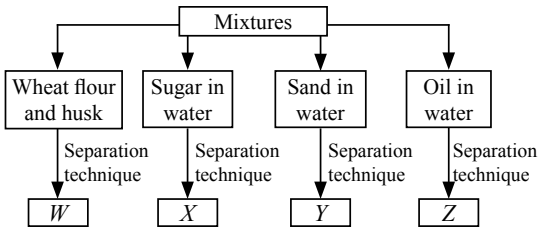
23. A few changes are listed in the box :

(i) Cutting of hair (ii) Mixing fruits and cornflakes (iii) Adding baking soda to vinegar (iv) Spoiling of food (v) Bending of a piece of metal on heating (vi) Decomposition of old leaves (vii) Shredding of paper

Which of the following represents their correct classification?

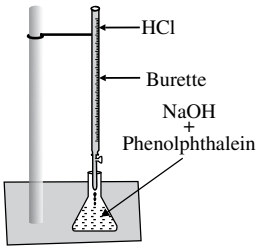
	Physical (Irreversible)	Physical (Reversible)	Chemical (Irreversible)
A.	(i), (vii)	(ii), (v)	(iii), (iv), (vi)
B.	(ii), (v)	(i), (vii)	(iii), (iv), (vi)
C.	(ii), (iii)	(i), (iv)	(v), (vi), (vii)
D.	(i), (vi)	(v), (vii)	(ii), (iii), (iv)

24. Identify *W*, *X*, *Y* and *Z* in the given flow chart.



	W	*X*	*Y*	*Z*
A.	Winnowing	Filtration	Sedimentation	Evaporation
B.	Sedimentation	Winnowing	Filtration	Separating funnel
C.	Sieving	Evaporation	Filtration	Separating funnel
D.	Handpicking	Sedimentation	Winnowing	Evaporation

25. Observe the given figure carefully and select the correct statements.



I. Heat is evolved in this reaction.
II. The colour of the mixture in the conical flask is pink in the beginning.
III. It represents a neutralisation reaction.
IV. No new substance is formed in the reaction.

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

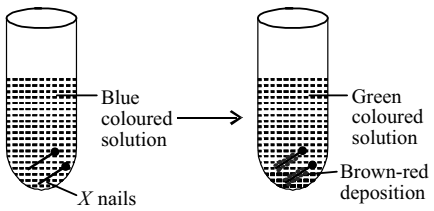
26. Somya took water in five different tumblers (I-V) and added different substances to each tumbler. She stirred the contents with spoon and then recorded her observations in the given table.

S. No.	Substance added	Observation	Inference
I.	Sand	Disappear in water	Soluble
II.	Soap powder	Disappear in water	Insoluble
III.	Talcum powder	Does not disappear	Insoluble
IV.	Sawdust	Disappear in water	Soluble
V.	Grounded wax	Does not disappear	Insoluble

The correct observations and inferences are

A. I, II and IV only B. III and V only
C. IV and V only D. None of these.

27. Study the given figure carefully.



Which of the following reactions explains the above change most appropriately?

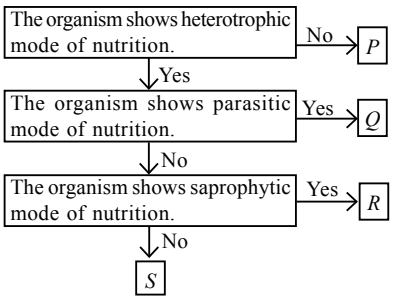
A. $ZnSO_4 + Cu \rightarrow CuSO_4 + Zn$
B. $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$
C. $FeSO_4 + Cu \rightarrow CuSO_4 + Fe$
D. $CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

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

	Column I		Column II
P.	Used as a preservative	(i)	KNO_3
Q.	Used in medicines as well as in fire extinguishers	(ii)	$CuSO_4 \cdot 5H_2O$
R.	Used as a fungicide and in electroplating	(iii)	NaCl
S.	Used in fireworks	(iv)	$NaHCO_3$

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

29. Refer to the given flow chart and select the option that correctly identifies organisms *P*, *Q*, *R* and *S*.

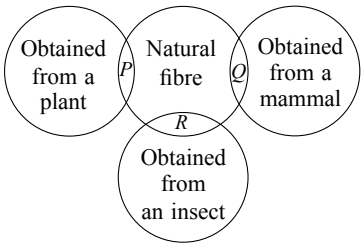


	P	***Q***	***R***	***S***
A.	*Hydrilla*	*Hydra*	*Dionaea*	*Amoeba*
B.	*Hibiscus*	*Taenia*	Bladderwort	*Croton*
C.	*Elodea*	*Cuscuta*	*Rhizopus*	*Gambusia*
D.	*Ocimum*	*Coleus*	Mistletoe	*Spirogyra*

30. Aryan took two food samples *X* and *Y* in separate test tubes. He added 2-3 drops of Benedict's solution in food sample *X* and heated it while he added two drops of copper sulphate solution and few drops of caustic soda solution in food sample *Y*. He observed that sample *X* turned orange while sample *Y* turned violet.
Which of the following is correct regarding *X* and *Y*?
A. *X* could be egg while *Y* could be boiled potato.
B. *X* could be ripened banana while *Y* could be milk.
C. *X* could be wheat while *Y* could be butter.
D. *X* could be milk while *Y* could be rice.

31. Select the incorrect match.
(i) Ammonotelism - Sponges, *Hydra*, Cartilaginous fish, Leech, Crocodile
(ii) Ureotelism - Frog, Toad, Bony fish, Turtle, Man, Land Snail
(iii) Uricotelism - Cockroach, Pigeon, Tortoise, Lizard, Snake
A. (i) and (ii) only B. (ii) and (iii) only
C. (iii) only D. (i), (ii) and (iii)

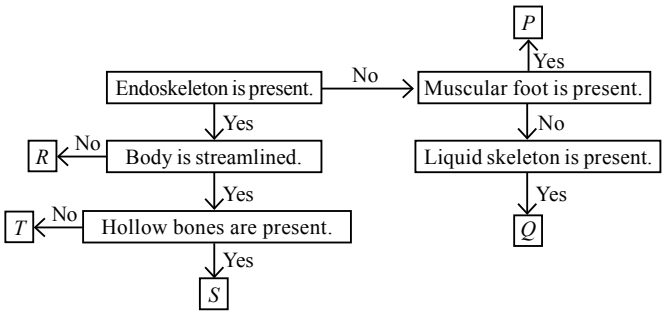
32. Refer to the given Venn diagram and select the incorrect option regarding *P*, *Q* and *R*.



A. *P* is a cellulosic fibre whereas *Q* and *R* are protein fibres.
B. *P* could be sisal, *Q* could be wool and *R* could be cotton.
C. *Q* could be obtained from the same animal repeatedly whereas *R* could be obtained from an animal only once in its lifetime.
D. Processing of fibres *P*, *Q* and *R* may involve retting, shearing and reeling steps, respectively.

33. Read the given paragraph.
Pollination processes *P*, *Q* or *R* are requisite for accomplishment of sexual reproduction in plants. *P* does not require any external agent but *Q* and *R* do. *P* and *Q* help in producing purelines whereas *R* gives rise to offspring showing variations among themselves. Identify processes *P*, *Q* and *R* and select the correct option regarding these.
A. Process *P* is possible in both unisexual and bisexual flowers.
B. Sexual reproduction in papaya and cucurbit is accomplished through processes *P* and *Q* both.
C. In case of Maple and *Dandelion*, wind serves as an agent for completion of process *R*.
D. Sunflower and *Rafflesia* produce bright showy flowers with nectar and odour to attract bats for completion of process *Q*.

34. Refer to the given flow chart and select the incorrect option regarding organisms *P*, *Q*, *R*, *S* and *T*.

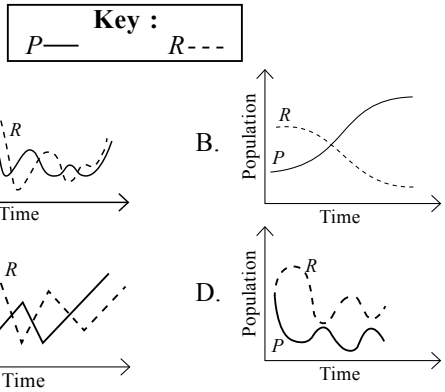


A. *P* may have a pair of tentacles which bear simple eyes at the tip whereas body of *Q* may be metamerically segmented.
B. *S* could be a warm blooded stork whereas *T* could be a cold blooded arowana.
C. *R* may bear jointed appendages and undergoes moulting during its growth phase.
D. *T* may respire through gills whereas *S* possesses lungs as its respiratory organs.

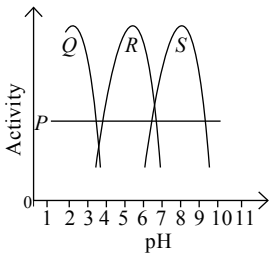
35. Refer to the given food chain operating in an ecosystem.

Producer $\longrightarrow$ *P* $\longrightarrow$ *Q* $\longrightarrow$ *R*

A population of organism *X* is introduced in this community which exclusively feeds on *Q*. Which of the following graphs correctly shows the changes in populations of *P* and *R* over time?

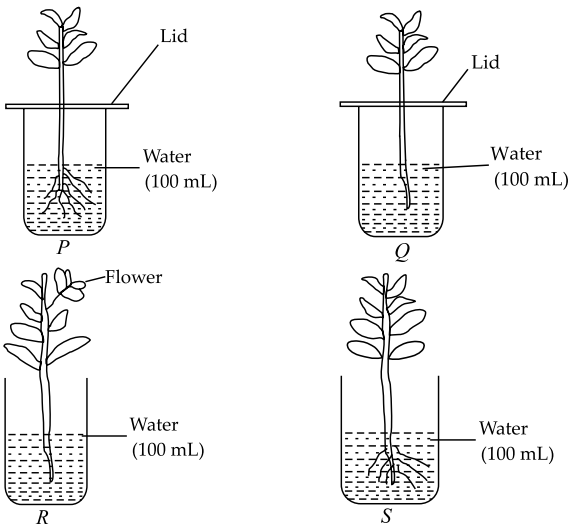


36. The given graph shows the effect of pH on the activity of four different enzymes (*P*, *Q*, *R* and *S*). Which of the following correctly identifies enzyme found in the stomach, small intestine and one not affected by pH?



	Stomach	Small intestine	Unaffected by pH
A.	*R*	*S*	*Q*
B.	*S*	*P*	*R*
C.	*P*	*R*	*Q*
D.	*Q*	*S*	*P*

37. Manya wanted to find out if plants absorb water through their roots, so she decided to conduct an experiment. Which of the following two set-ups should she choose to conduct a fair test?

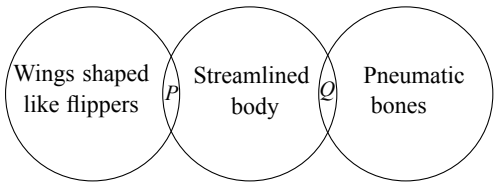


A. *P* and *Q*
B. *Q* and *S*
C. *Q* and *R*
D. None of these

38. To prepare a blood smear slide a student placed a drop of blood on a glass slide and added a drop of distilled water to dilute the blood. He then added stain (a coloured chemical used to see the cells) to it before placing the coverslip over it. When viewed, under the microscope he could not see the blood cells. Which of the following best explains this?

A. The blood cells had burst.
B. The blood had dried before the water was added.
C. The drop of water diluted the blood too much and cells dispersed too far away from each other.
D. The water caused the cells to shrink.

39. Refer to the given Venn diagram and select the incorrect option regarding *P* and *Q*.



A. *P* has thick layer of subcutaneous fat for effective insulation against cold.
B. *P* is cold blooded whereas *Q* is warm blooded.
C. *P* is penguin which is adapted to live in extremely cold regions whereas *Q* could be Siberian crane which escapes harsh winters by migrating to warmer lands.
D. Both *P* and *Q* may have webbed feet but *P* is adapted to swimming whereas *Q* may swim and fly both.

40. If a person is unable to breathe on his own due to some medical illness, an iron lung may be employed to take over the role of the diaphragm and the intercostal muscles. The person is placed in a cylindrical chamber called iron lung while his head remains outside the cylinder. An airtight seal is placed around his neck. Changes in the air pressure within the iron lung allow the flow of air into and out of his lungs.

Which of the following statements about the iron lung is correct?

A. Breathing with an iron lung is still possible if the patient's trachea is completely blocked.
B. During exhalation, the iron lung causes the patient's lungs to expand.
C. During inhalation, the pressure in the patient's lungs is increased.
D. Inhalation and exhalation is possible even if the patient's lung is punctured.

41. Which of the following is the most effective way to measure the effect of different carbon dioxide concentrations on the rate of photosynthesis?

A. Placing same amount of dry ice in similar bell jars kept in sunlight containing different plants.
B. Using different concentrations of sodium hydrogen carbonate solution with same type of immersed water plants in similar bell jars placed in sunlight.
C. Varying light intensity given to different well watered plants placed in similar bell jars kept in sunlight.
D. Varying amount of air provided to different well watered plants placed in similar bell jars kept in sunlight.

42. Saurashtra, a land with history of severe water scarcity, hostile climate and rocky land is now self sufficient in water availability due to the efforts of _____ who taught the local people the importance of rainwater harvesting.

A. Rajendra Singh
B. ShamjibhaiJ.Antala
C. Amla Ruia
D. Aabid Surti

43. Refer to the given dichotomous key.

I. (a) Food is obtained from plants. - Go to II
(b) Food is obtained from animals. - Go to III
II. (a) Food is obtained from roots of plants. – [*P*]
(b) Food is obtained from seeds of plants. – [*Q*]

III. (a) Food is categorised as energy giving food. – $\boxed{R}$

(b) Food is categorised as body building food. – $\boxed{S}$

Now select the correct option regarding food *P*, *Q*, *R* and *S*.

A. *P* could be fenugreek whereas *Q* could be corn or maize.

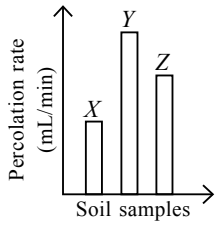
B. *R* could be egg whereas *S* could be honey.

C. *R* could be obtained from a flying insect whereas *S* could be obtained from both oviparous and viviparous animals.

D. *P* could be turmeric or ginger whereas *Q* could be rice or lentils.

44. Rahul took equal amount of three types of soil *X*, *Y* and *Z* in different vessels, each with pores at the bottom. He then poured equal amount of water over each sample one by one and tabulated the percolation rate of these three samples as represented by the given graph.

Select the correct option regarding this.



A. Soil *Y* shows highest water retention and is best suited for making the bottom of an artificial pond.

B. Soil *Y* is present in marshes whereas soil *Z* is abundantly found at sea shores.

C. Soil *Y* is well drained whereas soil *X* is not, hence is often water logged.

D. Soil *X* is well aerated hence ideal for growth of plant roots whereas plants growing in soil *Z* possess aerial roots or pneumatophores as it is water logged.

45. Study the given relationship.

Fruit peel :: Used syringe :: Plastic tiffin

Select the option that satisfies the same relationship.

A. Chapati :: Used urine bag :: Glass bottles

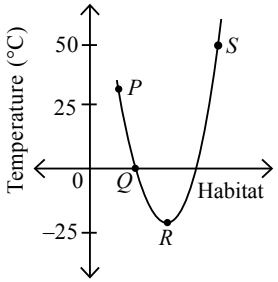
B. Newspaper :: Blood sample :: Cooked beans

C. Spectacles :: Rotten vegetable :: Mirror

D. Metal keys :: Newspaper :: Animal excreta

ACHIEVERS SECTION

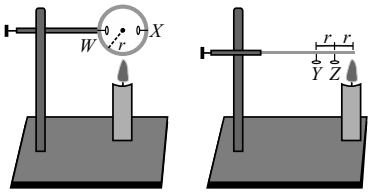
46. Refer to the given graph and identify habitats *P*, *Q*, *R* and *S*.



Now, select the option that correctly matches the habitat with the type of adaptation shown by organisms inhabiting them.

	P	*Q*	*R*	*S*
A.	Camouflage	Excretion of concentrated urine	Leaves with extensive lamina	Thick fur
B.	Startling colouration	Thick fur	Subcutaneous fat	Leaves modified into spines
C.	Mimicry	Leaves modified into spines	Aestivation	Roots reduced or absent
D.	Pneumatophores	Stem stores water and mucilage	Startling colouration	Blubber

47. In the arrangements I and II shown in figure, four pins *W*, *X*, *Y* and *Z* are fixed to a metal loop and metal rod with the help of wax. Loop and rod are made of same material and equal thickness. Which set of pins will fall simultaneously? (*r* is the radius of the loop.)



A. *Y* and *Z* only

B. *W*, *X* and *Y* only

C. *W* and *X* only

D. *W*, *X*, *Y* and *Z*

48. A few solutions were tested with different indicators and results were noted down in the given table.

S. No.	Solution	Colour with China rose indicator	Colour with methyl orange indicator
1.	*V*	Dark pink	Red
2.	*W*	Dark pink	Red
3.	*X*	Light pink	Orange
4.	*Y*	Green	Yellow
5.	*Z*	Light pink	Orange

Study the given table carefully and fill in the blanks by choosing an appropriate option.

Solution(s) $\underline{\text{(i)}}$ will have no effect on blue litmus paper while solution(s) $\underline{\text{(ii)}}$ will turn blue litmus red. Phenolphthalein remains colourless in solution(s) $\underline{\text{(iii)}}$ while it changes to pink colour in solution(s) $\underline{\text{(iv)}}$.

	(i)	(ii)	(iii)	(iv)
A.	*X*,*Y*	*V*	*W*,*Z*	*Z*
B.	*X*, *Y*, *Z*	*V*, *W*	*V*, *W*, *X*, *Z*	*Y*
C.	*V*, *W*, *X*, *Z*	*V*, *W*	*Y*	*X*, *Y*, *Z*
D.	*X*,*Y*, *Z*	*V*, *W*	*V*, *W*	*Y*, *Z*

Direction (Q. No. 49 and 50): Read the given passage having some variables and few italicised words.
Different respiratory organs are present in different organisms. *X* is the main respiratory organ in humans. Respiratory system of cockroach consists of small openings on the sides of its body called *tracheoles* which are connected to the tubes called *tracheae* that are further branched into *spiracles*. Scoliodon respires through *Y* which is richly supplied with blood vessels. *Z* is the main site of gaseous exchange in plants. Each *Z* is guarded by two kidney shaped *subsidiary* cells which are further flanked by specialised epidermal cells called *guard* cells.

49. Identify *X*, *Y* and *Z* in the given passage and select the incorrect option regarding them.
    A. Whales and dolphins also have *X* as their respiratory organ where alveoli is the main site of gaseous exchange.
    B. *Y* is the respiratory organ in tadpole larva and sea horse.
    C. *Z* is absent in all hydrophytes but is abundantly present on the upper leaf surface of all xerophytes.
    D. When pressure inside *X* drops, inspiration occurs and when pressure inside *X* starts increasing the air contained in it is pushed out causing expiration.

50. Select the correct option regarding the words italicised in the given passage.
    A. The positions of *spiracles* and *tracheoles* should be interchanged.
    B. The position of *tracheoles* and *tracheae* should be interchanged.
    C. *Subsidiary* should not be replaced as it is correctly mentioned.
    D. *Guard* should be replaced by *lenticel.*

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

Class 7

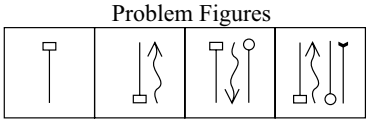
NSO

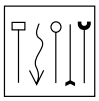
Set B

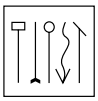
Year 2017

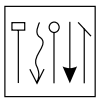
1. Select a figure from the options which will continue the same series as established by the Problem Figures.

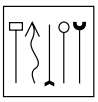
Problem Figures



A. 

B. 

C. 

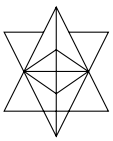
D. 

2. Arrange the given words in a meaningful sequence and select the correct option.

1. Probation
2. Interview
3. Advertisement
4. Selection
5. Application

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

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



A. 36
B. 38
C. 34
D. None of these

4. If P is brother of Q, Q is sister of S and S is father of R, then how is R related to P?

A. Brother
B. Nephew
C. Son
D. Cannot be determined

5. Select the correct water image of Fig. (X).

Fig. (X)

A. 

B. 

C. 

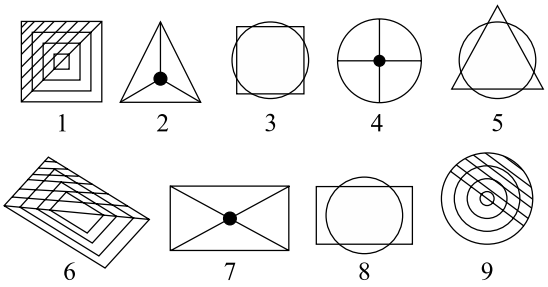
D. 

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

72	?	225
4	3	1
2	1	2
0	5	6

A. 173
B. 153
C. 182
D. 142

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

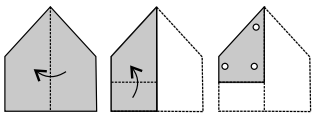


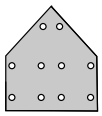
A. 1, 6, 9; 3, 4, 7; 2, 5, 8
B. 3, 1, 6; 4, 5, 7; 2, 8, 9
C. 1, 6, 9; 3, 5, 8; 2, 4, 7
D. 1, 4, 9; 3, 5, 7; 2, 6, 8

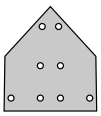
8. Riya walks 15 m towards West. She turned left and walks 20 m. She then turned left and walked 15 m. After this she turned to her right and walks 12 m. How far and in which direction is she now from the starting point?

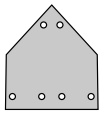
A. 32 m, South
B. 47 m, East
C. 42 m, North
D. 42 m, South

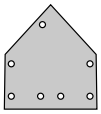
9. The given question consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. Select a figure from the options which would most closely resemble the unfolded form of Fig. (Z).



A. 

B. 

C. 

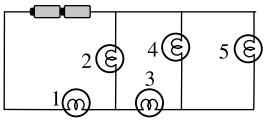
D. 

10. If the first and third digits in each of the following numbers are interchanged and then the numbers are arranged in descending order. What will be the middle digit of the middle number?

613 432 573 485 907

A. 8
B. 1
C. 3
D. 7

11. The given diagram shows five bulbs connected to two dry cells. When one of the bulbs is faulty, the other four bulbs remain lighted. Which bulb is faulty?



A. 1 only
B. 3 only
C. 2 or 4 only
D. 2 or 4 or 5 only

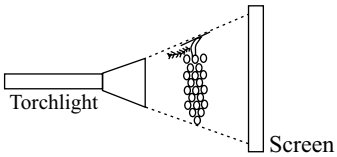
12. Which of the following statements are correct?
(i) Increased wind speed results in reduced air pressure.
(ii) Wind current occurs due to the uneven heating of the earth by the sun.
(iii) In thunderstorm it is safe to lie on the ground.
(iv) High pressure prevailing at the centre of the cyclone is called the eye.

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

13. Which of the following statements are correct about pots?
(i) Black pots are used for cooking because they increase the rate of cooking.
(ii) Silver pots are used for keeping food warm because they decrease the rate of heat dissipation.
(iii) Pots are made of clay to increase the rate of cooking.

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

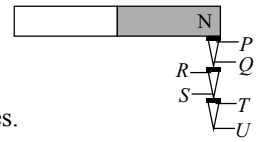
14. Anu shone a torchlight at a bunch of grapes as shown here. What can Anu do to enlarge the shadow of the bunch of grapes on the screen?



(i) Shift the grapes nearer to the torchlight.
(ii) Shift the screen away from the grapes.
(iii) Shift the screen closer to the grapes.
(iv) Shift the torchlight further away from the grapes.

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

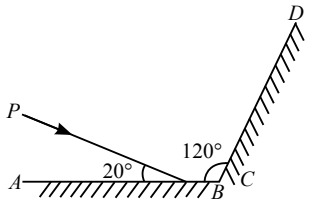
15. Raju used a magnet to attract an iron nail. Then he observed that more nails could be attracted in a manner as shown here. N represents north pole of magnet.



Which of the following statements about the iron nails is correct?

A. *P* and *S* are the north poles.
B. *Q* will repel *T*.
C. *S* and *U* will attract each other.
D. *R* and *T* are like poles.

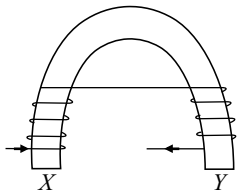
16. Figure shows a ray of light *P* striking a mirror *AB*. The mirror *AB* and the mirror *CD* makes an angle of 120° with each other.



What is the angle of reflection at mirror *CD*?

A. 50°
B. 40°
C. 30°
D. 90°

17. A current-carrying wire is coiled around an iron horseshoe as shown in the figure. What are the polarities at *X* and *Y*?



	At *X*	**At *Y***
A.	North pole	North pole
B.	South pole	South pole
C.	North pole	South pole
D.	South pole	North pole

18. A train leaves a station *X* at 5:00 pm and reaches another station *Y* at midnight. Its speed is 90 km h^{-1}. What is the distance between stations *X* and *Y*?

A. 480 km
B. 630 km
C. 800 km
D. 830 km

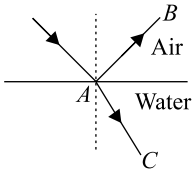
19. Read the given statements and select the correct option.

Statement 1 : If you hold a paper strip of 20 cm width between the forefinger and thumb and blow air over its top, then the far end of the paper strip begins to lift upwards.

Statement 2 : Pressure reduces when air moves with high speed.

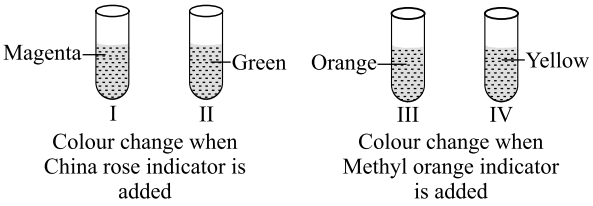
A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Statement 1 is false but statement 2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

20. A ray of light travels from air to water as shown in figure. What are ray *AB* and ray *AC*?



	Ray *AB*	**Ray *AC***
A.	Reflected ray	Refracted ray
B.	Reflected ray	Reflected ray
C.	Refracted ray	Reflected ray
D.	Refracted ray	Refracted ray

21. Shruti tested the nature of a few common substances with the help of some indicators. Indicators used and changes she observed are as follows :



Substances present in test tubes I, II, III and IV are respectively

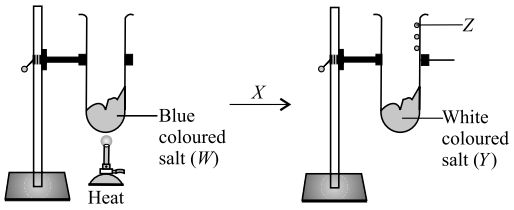
A. Salt solution, curd, lemon juice and vinegar
B. Orange juice, window cleaner, sugar solution and lime water
C. Vinegar, soda water, soap solution and lemon juice
D. Lemon juice, lime water, window cleaner and soap solution.

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

	Column I	Column II
P.	Difference in size of components of a mixture	(i) Winnowing
Q.	Difference in the weight of components of a mixture	(ii) Handpicking
R.	Difference in size, shape and colour of components of a mixture	(iii) Sieving
S.	If solid particles in a liquid are very small and can pass through a filter paper	(iv) Centrifugation

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

23. Observe the given change carefully and identify *W*, *X*, *Y* and *Z*.



	W	*X*	*Y*	*Z*
A.	$CuSO_4.5H_2O$	Physical change	$CuSO_4$	H_2O vapours
B.	$MgSO_4.7H_2O$	Physical change	$MgSO_4$	H_2O vapours
C.	$FeSO_4.7H_2O$	Chemical change	$FeSO_4$	H_2O droplets
D.	$CuSO_4.5H_2O$	Chemical change	$CuSO_4$	H_2O droplets

24. Consider the following pairs of substances :
I : Glass plate and steel plate
II : Iron nail and wooden rod
III : Glass marble and flower petals
IV : Chalk powder and sugar

Which of the following represents the properties best suitable to distinguish between the substances of each pair?

	I	II	III	IV
A.	Conductivity	Elasticity	Shape	Physical state
B.	Transparency	Magnetic nature	Relative density	Solubility in water
C.	Brittleness	Colour	Miscibility	Taste
D.	Transparency	Conductivity	Elasticity	Solubility in water

25. Ms Rakhi, a science teacher listed some keywords on the blackboard as :

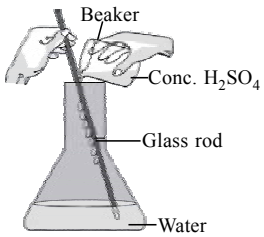
(i) Freezing	(ii) Evaporation	(iii) Melting
(iv) Sublimation	(v) Condensation	(vi) Vaporisation

She asked students to match the keywords with the common changes which are listed as :

P : When we put a lid on a vessel containing hot milk, the inside of the lid gets wet.
Q : When we breathe onto a cold mirror it turns foggy.
R : When we spread hard butter on a warm toast, it becomes soft.
S : Solid piece of an air freshener kept on the bathroom shelf disappears in a few days.
T : When we put ice cubes in water, they disappear after some time.
U : Milk left in the freezer becomes ice cream.
The correct match is

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

26. Observe the given figure carefully and choose the incorrect statement(s).



I. Large volume of acid should be added to a small volume of water slowly.
II. The figure represents the process of concentrating dilute H_2SO_4.
III. The process involves release of a large amount of heat.
IV. Water should not be stirred.

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

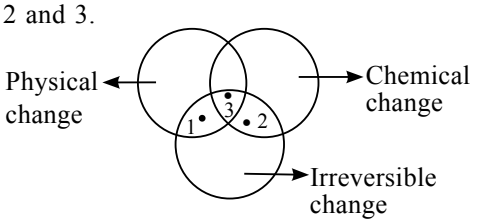
27. Ria, a class 7 student classified a few changes as shown in the table :

S. No.	Periodic change	Non-periodic change
I.	Occurrence of new moon	Volcanic eruption
II.	Growth of plants	Heartbeat
III.	Occurrence of a rainbow	Low and high tides
IV.	Sunrise and sunset	Falling of trees
V.	Opening of Morning glory flower	Earthquake

The changes classified correctly are

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

28. Study the given Venn diagram and identify points 1, 2 and 3.



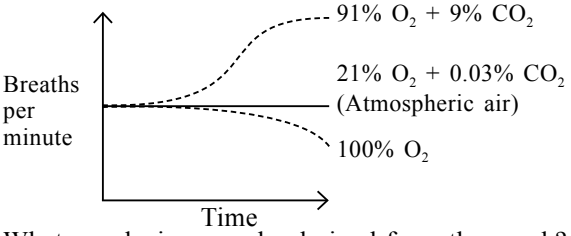
	1	2	3
A.	Melting of ice	Boiling of rice	Burning of a candle
B.	Burning of paper	Rusting of iron	Cutting of fruits
C.	Breaking of a glass	Baking a cake	Burning of LPG in kitchen
D.	Tearing of paper	Evaporation of water	Making lemonade

29. Radhika classified plants into three groups of three members each. By mistake, she placed one incorrect member in each group. Identify this odd member and select the correct option.

Group I : *Nepenthes, Rafflesia, Drosera*
Group II : *Cuscuta, Hydnora, Utricularia*
Group III : *Hibiscus, Petunia, Dionaea*

A. *Drosera* in group I should be interchanged with *Hydnora* in group II.
B. *Utricularia* in group II should be interchanged with *Petunia* in group III.
C. *Rafflesia* in group I should be interchanged with *Hibiscus* in group III.
D. *Utricularia* in group II should be interchanged with *Rafflesia* in group I whereas *Dionaea* in group III should be replaced with *Ocimum*.

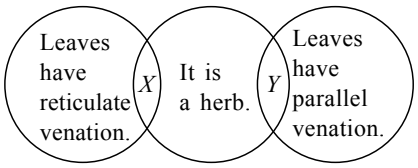
30. The given graph shows how the rate of breathing of a person changes under different conditions. At the beginning of each experiment, the person is breathing in atmospheric air.



What conclusion may be derived from the graph?

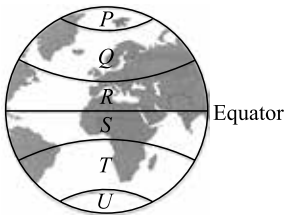
A. High level of oxygen in the air causes breathing rate to drop, regardless of carbon dioxide level.
B. Increase in carbon dioxide level in air causes breathing rate to increase upto a limit.
C. Breathing rate is controlled only by oxygen content of air and is independent of carbon dioxide concentration.
D. None of these

31. Refer to the given Venn diagram and select the correct option regarding *X* and *Y*.



	X	Y
A.	*Aloe*	Mint
B.	Coriander	Maize
C.	Basil	Mustard
D.	Palm	Bamboo

32. Refer to the given figure showing different temperature zones of the Earth and select the correct statement.



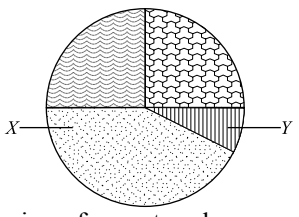
A. Labelled parts *P* and *U* are the torrid zones.
B. Labelled parts *Q* and *T* are temperate zones.
C. Labelled parts *R* and *S* are frigid zones.
D. None of these

33. Refer to the given dichotomous key and select the correct option regarding *P, Q, R* and *S*.

I. (a) It is a vitamin deficiency disease. – Go to II
(b) It is a mineral deficiency disease. – Go to III
II. (a) It is characterised by bleeding gums and aching joints. – $\boxed{P}$
(b) It is characterised by red rashes, scaly lesions on skin, diarrhoea, dementia, etc. – $\boxed{Q}$
III. (a) It affects haemoglobin formation in blood. – $\boxed{R}$
(b) It affects many metabolic processes of the body and is often characterised by prominent swelling in neck region. – $\boxed{S}$

A. *P* is caused by vitamin C deficiency whereas *Q* is caused by vitamin E deficiency.
B. *P* is scurvy, *Q* is pellagra, *R* is anaemia and *S* is goitre.
C. Person suffering from *R* should take iodised salt and more of citrus fruits.
D. Diseases *P* and *Q* occur in children only whereas diseases *R* and *S* occur only in adults.

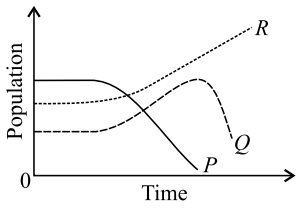
34. Refer to the given pie diagram representing composition of soil.



Select the correct option regarding constituents *X* and *Y*.

A. *X* is formed by weathering of parent rock.
B. *Y* contains nutrients required by the plants for their proper growth.
C. *X* is composed of gravel, sand, silt or clay.
D. All of these

35. Small population of three organisms *P*, *Q* and *R* were reared in captivity for sometime. The given graph shows changes in their populations over time.



Study the graph and select the correct statements regarding organisms *P*, *Q* and *R*.

(i) *Q* could be a heterotroph whereas *P* and *R* could be autotrophs.

(ii) *Q* is a herbivore that feeds exclusively on *P*.

(iii) If population of *R* is removed from this community, then population of *P* will decrease whereas that of *Q* will increase.

(iv) *P* is a carnivore, *Q* is a herbivore whereas *R* is an omnivore that feeds on both *P* and *Q*.

(v) *R* is the predator of *P* which in turn is the predator of *Q*.

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

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36. The given figure shows the cross sections of two blood vessels *X* and *Y* found in humans.

Identify them and select the incorrect option regarding them.

A. *X* always carries oxygen rich blood away from the heart whereas *Y* always carries carbon dioxide rich blood towards the heart.

B. *Y* is provided with valves to prevent the back flow of blood whereas valves are absent in *X*.

C. *X* is usually deep seated whereas *Y* is superficially placed.

D. Pressure of blood is much higher in *X* as compared to *Y*.

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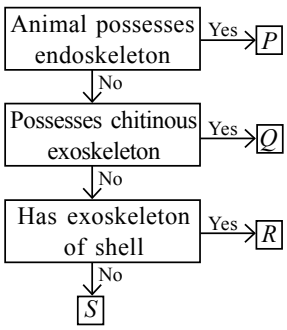
37. Refer to the given flow chart and select the incorrect option regarding *P, Q, R* and *S*.



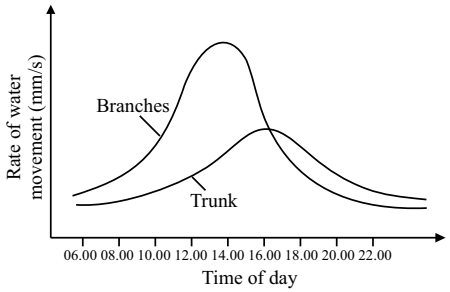
A. *P* may have mammary glands and may respire through lungs whereas *Q* may have jointed appendages and may respire through tracheae.

B. *Q* could be a fish with 2 chambered heart or a reptile with 3 chambered heart.

C. *R* may have unsegmented body with distinct head, muscular foot and visceral hump.

D. *S* could be a detritivore which respires through its moist skin and is often called as farmer's friend.

38. The given graph shows rate of water movement through trunk and branches of a tree during a day.



Which of the following can be inferred from the graph?

A. More water passes through the trunk than the branches.

B. The greatest increase in the rate of water movement first occurs in branches.

C. The increase in the rate of water movement first begins in the trunk.

D. None of these

---

39. Which of the following is not an adaptation?

A. Some aquatic animals possess gills for breathing and have streamlined bodies.

B. Forelimbs of birds are modified into wings and they have hollow air filled bones.

C. People living in plains suffer from altitude sickness when they visit mountainous regions but soon recover and adjust to the changes.

D. Animals inhabiting polar regions have thick furs and thick layers of subcutaneous fat.

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40. Mr Khanna had a pond in his garden, filled with all kinds of aquatic plants. He wanted to prevent mosquitoes from breeding in the pond without harming the plants in any way. He could _____.

(i) Add salt into the water

(ii) Add some goldfish into the pond

(iii) Spray a film of oil on the surface of the pond

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

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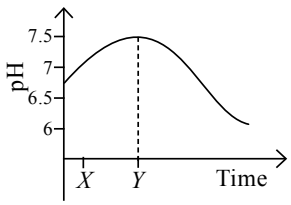
41. The given graph shows changes in pH of water in an undisturbed freshwater lake on a summer day.



What is the probable cause of the rise in pH of water between time period *X* and *Y*?

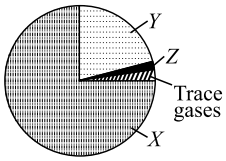
A. Decreased level of mineral nutrients in water.

B. Decreased level of carbon dioxide in water due to photosynthesis performed by water plants.

C. Increased level of carbon dioxide in water due to respiration performed by water plants and animals.

D. None of these

42. Refer to the given pie chart representing the composition of air.



Which of the following is the incorrect statement regarding it?

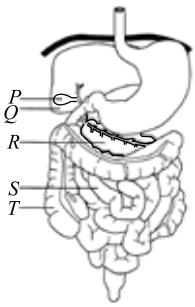
A. *X* is an important component of fertilisers and proteins present in our body.

B. *Y* is necessary for humans to get energy from food.

C. During the process of burning *X* is used up and *Z* is given out.

D. Both B and C

43. Refer to the given diagram of human digestive system and select the correct option regarding its labelled parts *P, Q, R, S* and *T*.



A. *R* secretes digestive enzymes *viz.* amylase, lipase, pepsin, trypsin, etc.

B. *P* secretes bile juice whereas *T* secretes hydrochloric acid.

C. *S* is longer in herbivores as compared to carnivores to aid the digestion of cellulose rich food.

D. *Q* is the largest digestive gland which secretes different enzymes for digestion of fats, proteins and carbohydrates.

44. Complete the given paragraph by selecting the correct option.

Jute is a rainy season crop and grows best in (i) climate. It grows well in (ii) soil receiving silt from annual floods, as in the Sunderban delta in (iii) and (iv).

A. (i)-Warm and humid, (ii)-Alluvial, (iii)-India, (iv)-Bangladesh

B. (i)-Cold and dry, (ii)-Black, (iii)-India, (iv)-Bangladesh

C. (i)-Warm and humid, (ii)-Sandy, (iii)-India, (iv)-Nepal

D. (i)-Cold and dry, (ii)-Alluvial, (iii)-Bangladesh, (iv)-Nepal

45. Read the following statements and select the incorrect one.

A. Platelets are smaller in size than both RBCs and WBCs.

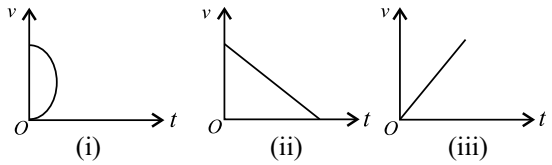
B. Platelet count decreases during certain infections.

C. Platelets prevent blood loss in case of any injury.

D. None of these

ACHIEVERS SECTION

46. Which of the following cannot be speed-time ($v - t$) graph(s)?



A. (ii) and (iv) only B. (iii) and (v) only

C. (iv) only D. (i) only

47. Fill in the blanks in the given table by choosing an appropriate option.

Solution	Indicators		
	Methyl orange	Phenolphthalein	China rose
(i)	Orange	Colourless	Pink
Lime water	Yellow	Pink	(ii)
(iii)	Red	Colourless	(iv)
(v)	Yellow	Pink	Green

	(i)	(ii)	(iii)	(iv)	(v)
A.	Vinegar	Red	Spinach juice	Yellow	Sugar solution
B.	Sugar solution	Yellow	Salt solution	Pink	Lime water
C.	Common salt	Green	Tomato juice	Magenta	Caustic soda
D.	Lime juice	Green	Salt solution	Yellow	Aerated drink

48. Refer to the given paragraph where few words have been italicised.

Wool is obtained from fleece of certain animals. Angora wool is obtained from Angora *goat*. It is much warmer and *softer* than other wools. Mohair wool is obtained from Angora *rabbit*. Cashmere is obtained from *yak* and is common in *Kashmir*. *Llama*, Alpaca and *Vicuna* are members of *camel* family that yield extremely fine and expensive wool.

Select the correct option regarding this.

A. *Softer* should be replaced with *harder* whereas *Vicuna* should be replaced with *Lohi*.

B. The positions of *goat* and *rabbit* should be interchanged.

C. *Yak* should not be replaced as it is correctly mentioned whereas *Kashmir* should be replaced with *Kota*.

D. *Camel* should be replaced with *sheep* whereas *Llama* should not be replaced as it is correctly mentioned.

49. Refer to the given dichotomous key and select the correct option regarding *P, Q, R* and *S*.

I. (a) Plant shows natural vegetative propagation. – Go to II

(b) Plant reproduces through asexual spores. – Go to III

II. (a) Plant propagates through stem. – [*P*]

(b) Plant propagates through leaves. – [*Q*]

III. (a) Leaves of plants called fronds contain spores. – [*R*]

(b) Short plants that grow only in moist habitats and bear spores in spore case or capsule. – [*S*]

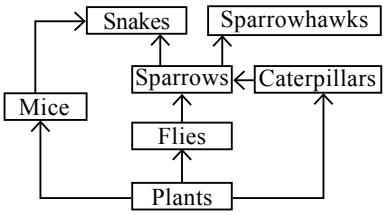
A. *P* could be *Chrysanthemum* or strawberry whereas *R* could be mushroom or mould.

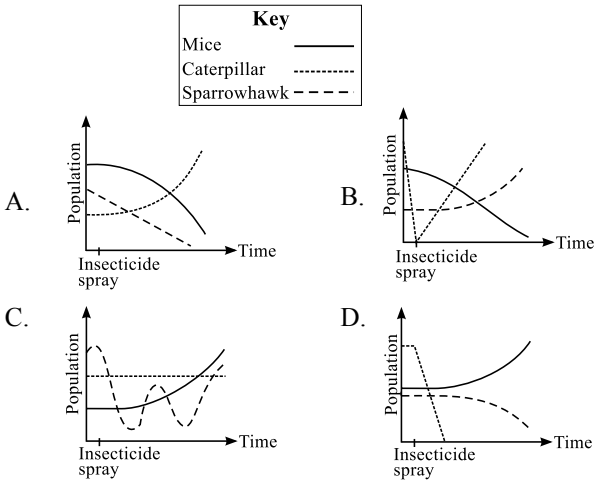
B. *Q* could be *Bryophyllum* or *Begonia* whereas *S* could be fern or moss.

C. *P* and *Q* may produce flowers and seeds whereas both these structures are absent in *R* and *S*.

D. *P* could be garlic that propagates through bulbs or turmeric that propagates through tuber whereas *Q* could be *Petunia* or *Begonia*.

50. Refer to the given food web operating in a community. Large amount of insecticides was sprayed in this community. Which of the following graphs correctly depicts the changes in numbers of mice, caterpillars and sparrowhawks over time?





SPACE FOR ROUGH WORK

ANSWER KEYS

NSO 2013

SET A

1. (C)	**2.** (A)	**3.** (D)	**4.** (B)	**5.** (A)	**6.** (A)	**7.** (B)	**8.** (B)	**9.** (D)	**10.** (B)
11. (A)	**12.** (B)	**13.** (B)	**14.** (C)	**15.** (C)	**16.** (D)	**17.** (B)	**18.** (B)	**19.** (C)	**20.** (A)
21. (B)	**22.** (C)	**23.** (C)	**24.** (B)	**25.** (C)	**26.** (D)	**27.** (A)	**28.** (A)	**29.** (B)	**30.** (B)
31. (A)	**32.** (C)	**33.** (C)	**34.** (C)	**35.** (B)	**36.** (D)	**37.** (B)	**38.** (D)	**39.** (B)	**40.** (C)
41. (C)	**42.** (D)	**43.** (C)	**44.** (B)	**45.** (C)	**46.** (C)	**47.** (C)	**48.** (C)	**49.** (A)	**50.** (D)

SET B

1. (D)	**2.** (D)	**3.** (A)	**4.** (A)	**5.** (D)	**6.** (A)	**7.** (C)	**8.** (A)	**9.** (B)	**10.** (D)
11. (B)	**12.** (C)	**13.** (C)	**14.** (C)	**15.** (A)	**16.** (D)	**17.** (A)	**18.** (B)	**19.** (C)	**20.** (A)
21. (D)	**22.** (D)	**23.** (A)	**24.** (A)	**25.** (C)	**26.** (C)	**27.** (C)	**28.** (D)	**29.** (C)	**30.** (C)
31. (C)	**32.** (A)	**33.** (B)	**34.** (D)	**35.** (A)	**36.** (C)	**37.** (D)	**38.** (C)	**39.** (C)	**40.** (D)
41. (A)	**42.** (A)	**43.** (B)	**44.** (D)	**45.** (D)	**46.** (B)	**47.** (A)	**48.** (A)	**49.** (A)	**50.** (D)

NSO 2014

SET A

1. (D)	**2.** (A)	**3.** (D)	**4.** (B)	**5.** (B)	**6.** (A)	**7.** (C)	**8.** (A)	**9.** (B)	**10.** (C)
11. (A)	**12.** (C)	**13.** (A)	**14.** (A)	**15.** (C)	**16.** (C)	**17.** (C)	**18.** (D)	**19.** (B)	**20.** (B)
21. (C)	**22.** (B)	**23.** (C)	**24.** (B)	**25.** (D)	**26.** (A)	**27.** (D)	**28.** (D)	**29.** (B)	**30.** (A)
31. (C)	**32.** (D)	**33.** (D)	**34.** (B)	**35.** (D)	**36.** (B)	**37.** (C)	**38.** (C)	**39.** (C)	**40.** (D)
41. (C)	**42.** (C)	**43.** (D)	**44.** (A)	**45.** (B)	**46.** (A)	**47.** (C)	**48.** (C)	**49.** (D)	**50.** (D)

SET B

1. (D)	**2.** (D)	**3.** (C)	**4.** (C)	**5.** (D)	**6.** (D)	**7.** (B)	**8.** (C)	**9.** (C)	**10.** (B)
11. (B)	**12.** (B)	**13.** (A)	**14.** (C)	**15.** (C)	**16.** (D)	**17.** (A)	**18.** (A)	**19.** (B)	**20.** (D)
21. (B)	**22.** (B)	**23.** (C)	**24.** (B)	**25.** (B)	**26.** (B)	**27.** (C)	**28.** (A)	**29.** (D)	**30.** (A)
31. (B)	**32.** (B)	**33.** (B)	**34.** (C)	**35.** (D)	**36.** (D)	**37.** (B)	**38.** (B)	**39.** (C)	**40.** (D)
41. (A)	**42.** (C)	**43.** (B)	**44.** (B)	**45.** (B)	**46.** (B)	**47.** (C)	**48.** (B)	**49.** (D)	**50.** (C)

NSO 2015

SET 1

1. (B)	**2.** (C)	**3.** (C)	**4.** (A)	**5.** (B)	**6.** (B)	**7.** (D)	**8.** (D)	**9.** (B)	**10.** (B)
11. (D)	**12.** (A)	**13.** (B)	**14.** (D)	**15.** (D)	**16.** (B)	**17.** (C)	**18.** (C)	**19.** (A)	**20.** (A)
21. (D)	**22.** (C)	**23.** (B)	**24.** (B)	**25.** (D)	**26.** (D)	**27.** (C)	**28.** (B)	**29.** (B)	**30.** (C)
31. (A)	**32.** (A)	**33.** (B)	**34.** (C)	**35.** (D)	**36.** (B)	**37.** (D)	**38.** (C)	**39.** (C)	**40.** (B)
41. (B)	**42.** (C)	**43.** (D)	**44.** (D)	**45.** (C)	**46.** (D)	**47.** (B)	**48.** (B)	**49.** (B)	**50.** (C)

SET 2

1. (B)	**2.** (C)	**3.** (D)	**4.** (D)	**5.** (C)	**6.** (C)	**7.** (B)	**8.** (D)	**9.** (D)	**10.** (A)
11. (A)	**12.** (D)	**13.** (B)	**14.** (D)	**15.** (B)	**16.** (D)	**17.** (D)	**18.** (B)	**19.** (B)	**20.** (B)
21. (B)	**22.** (B)	**23.** (C)	**24.** (A)	**25.** (C)	**26.** (B)	**27.** (C)	**28.** (D)	**29.** (B)	**30.** (B)
31. (D)	**32.** (D)	**33.** (A)	**34.** (D)	**35.** (B)	**36.** (D)	**37.** (B)	**38.** (A)	**39.** (B)	**40.** (C)
41. (B)	**42.** (D)	**43.** (D)	**44.** (A)	**45.** (C)	**46.** (B)	**47.** (C)	**48.** (B)	**49.** (D)	**50.** (A)

NSO 2016

SET A

1. (A)	**2.** (A)	**3.** (B)	**4.** (A)	**5.** (D)	**6.** (D)	**7.** (B)	**8.** (B)	**9.** (C)	**10.** (A)
11. (C)	**12.** (C)	**13.** (A)	**14.** (C)	**15.** (A)	**16.** (B)	**17.** (B)	**18.** (B)	**19.** (C)	**20.** (C)
21. (A)	**22.** (B)	**23.** (A)	**24.** (C)	**25.** (D)	**26.** (D)	**27.** (C)	**28.** (C)	**29.** (C)	**30.** (B)
31. (C)	**32.** (D)	**33.** (B)	**34.** (A)	**35.** (B)	**36.** (C)	**37.** (A)	**38.** (D)	**39.** (B)	**40.** (C)
41. (A)	**42.** (C)	**43.** (C)	**44.** (B)	**45.** (C)	**46.** (D)	**47.** (D)	**48.** (A)	**49.** (C)	**50.** (A)

SET B

1. (B)	**2.** (B)	**3.** (A)	**4.** (B)	**5.** (B)	**6.** (B)	**7.** (A)	**8.** (D)	**9.** (D)	**10.** (B)
11. (B)	**12.** (C)	**13.** (A)	**14.** (B)	**15.** (C)	**16.** (C)	**17.** (A)	**18.** (C)	**19.** (B)	**20.** (B)
21. (A)	**22.** (C)	**23.** (C)	**24.** (C)	**25.** (B)	**26.** (C)	**27.** (D)	**28.** (C)	**29.** (B)	**30.** (A)
31. (B)	**32.** (A)	**33.** (C)	**34.** (D)	**35.** (C)	**36.** (B)	**37.** (C)	**38.** (C)	**39.** (D)	**40.** (D)
41. (B)	**42.** (C)	**43.** (D)	**44.** (C)	**45.** (B)	**46.** (B)	**47.** (B)	**48.** (B)	**49.** (D)	**50.** (C)

NSO 2017

SET A

1. (D)	**2.** (B)	**3.** (A)	**4.** (D)	**5.** (A)	**6.** (D)	**7.** (A)	**8.** (B)	**9.** (B)	**10.** (D)
11. (D)	**12.** (B)	**13.** (D)	**14.** (D)	**15.** (A)	**16.** (B)	**17.** (A)	**18.** (B)	**19.** (D)	**20.** (C)
21. (B)	**22.** (B)	**23.** (A)	**24.** (C)	**25.** (A)	**26.** (B)	**27.** (B)	**28.** (D)	**29.** (C)	**30.** (B)
31. (A)	**32.** (B)	**33.** (C)	**34.** (C)	**35.** (B)	**36.** (D)	**37.** (A)	**38.** (A)	**39.** (B)	**40.** (D)
41. (B)	**42.** (B)	**43.** (C)	**44.** (C)	**45.** (A)	**46.** (B)	**47.** (C)	**48.** (B)	**49.** (C)	**50.** (A)

SET B

1. (A)	**2.** (B)	**3.** (C)	**4.** (D)	**5.** (A)	**6.** (B)	**7.** (C)	**8.** (A)	**9.** (A)	**10.** (D)
11. (D)	**12.** (A)	**13.** (A)	**14.** (B)	**15.** (D)	**16.** (A)	**17.** (B)	**18.** (B)	**19.** (A)	**20.** (A)
21. (B)	**22.** (D)	**23.** (D)	**24.** (B)	**25.** (C)	**26.** (C)	**27.** (A)	**28.** (C)	**29.** (D)	**30.** (B)
31. (B)	**32.** (B)	**33.** (B)	**34.** (D)	**35.** (C)	**36.** (A)	**37.** (B)	**38.** (B)	**39.** (C)	**40.** (B)
41. (B)	**42.** (C)	**43.** (C)	**44.** (A)	**45.** (D)	**46.** (D)	**47.** (C)	**48.** (B)	**49.** (C)	**50.** (D)