NSO

CLASS 6

Contents

SCIENCE OLYMPIAD FOUNDATION

14th NSO

LEVEL - 2

Year 2011-12

CLASS24

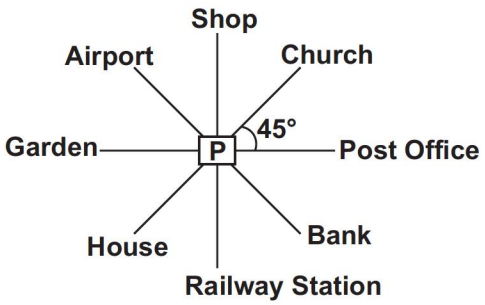
MENTAL ABILITY

1. **1 crore = _____ lakhs.**

(A) 10 **(B)** 100 **(C)** 1000 **(D)** 10,000

2. **Pratik is standing at point P, facing the shop. He takes a $\frac{3}{4}$ turn anticlockwise and then turns 270° in the clockwise direction. What is he facing now?**

(A) Church
(B) Bank
(C) Railway Station
(D) Shop



3. **Jenny took 1 hour 45 minutes to complete her homework. Jiah took $\frac{5}{7}$ of the time Jenny took. How long did Jiah take to complete her homework?**

(A) 1 hour 45 minutes **(B)** 1 hour 15 minutes **(C)** 2 hour 4 minutes **(D)** 2 hours

4. **Choose the correct mirror image of the given word, if the mirror is placed vertically left.**

PAINTED

(A) DETNIAP **(B)** DETNIAP **(C)** DETNIAP **(D)** DETNIAP

5. **The length and breadth of a playground are 75 m 20 cm and 34 m 80 cm respectively. How long will a boy take to go three times round the field if he walks at the rate of 1.5 m per second?**

(A) 7 mins 20 secs **(B)** 12 mins 14 secs **(C)** 39 mins 16 secs **(D)** 16 mins 30 secs

6. **Find the mean of the first 3 multiples of 5.**

(A) 10 **(B)** 25 **(C)** 20 **(D)** 15

7. **Select a suitable figure from the options which will substitute the question mark so that a series is formed by the figures P, Q, R, S and T taken in order.**

Problem Figures

(A)  **(B)**  **(C)**  **(D)** 

8. **The given table shows the number of rotis sold by Muthu in a week.**

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Number of rotis sold	30	55		60	80		100

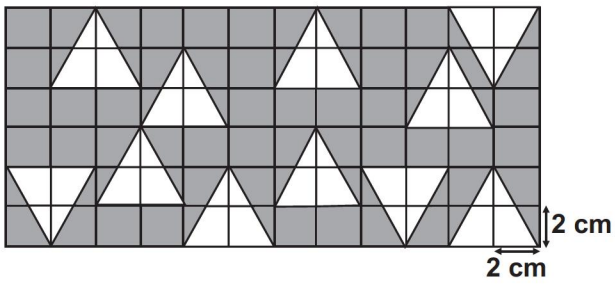
The number of rotis sold on Wednesday was 10 less than that sold on Thursday, and the number of rotis sold on Saturday was twice the number sold on Wednesday. The number of rotis sold on Wednesday and Saturday respectively, were _____.

(A) 60, 40 **(B)** 50, 100 **(C)** 100, 50 **(D)** 40, 60

9. **Find the difference between 16.89 × 6 and 21.88 ÷ 4.**

(A) 95.87 **(B)** 85.97 **(C)** 958.7 **(D)** –58.29

10. Find the area of the shaded region in the adjoining figure.



(A) 324 cm^2

(B) 200 cm^2

(C) 180 cm^2

(D) 88 cm^2

11. If the English alphabets are written in the reverse order and every alternate letter starting with Y is dropped, which letter will be exactly in the middle of the remaining letters of the English alphabet?

(A) M **(B)** N **(C)** O **(D)** M or O

12. The ratio of $4^{3.5}$ and 2^5 is same as :

(A) 4 : 1 **(B)** 8 : 15 **(C)** 15 : 8 **(D)** 3 : 4

13. Find the value of $\frac{(-32)-(-14)+(-18)-(-6)+(-5)}{-2-(-3)-(-6)}$.

(A) 5 **(B)** –5 **(C)** 1 **(D)** –1

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

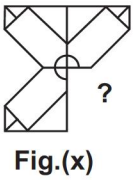


Fig.(x)

(A)  **(B)**  **(C)**  **(D)** 

15. Arrange the given words in a meaningful sequence and then choose the most appropriate sequence from the options.

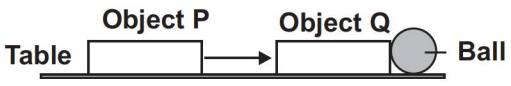
1. College **2. Child** **3. Salary** **4. School** **5. Employment**

(A) 1, 2, 4, 3, 5 **(B)** 2, 4, 1, 5, 3 **(C)** 4, 1, 3, 5, 2 **(D)** 5, 3, 2, 1, 4

SCIENCE

16. In given diagram, when object P was placed near object Q, the ball was pushed off the table. What could objects P and Q be ?

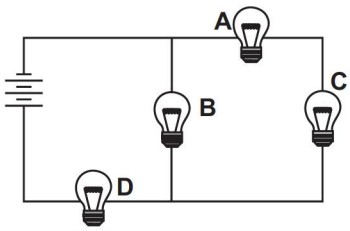
	P	Q
(A)	Steel	Plastic
(B)	Nickel	Magnet
(C)	Iron	Steel
(D)	Magnet	Magnet



17. Which one of the following sources of energy is non-renewable ?

(A) Solar energy **(B)** Fossil fuels **(C)** Biomass energy **(D)** Geothermal energy

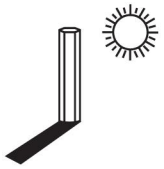
18. The given circuit diagram shows four bulbs in a circuit. Where should a switch be installed so that only one bulb can be switched on or off while the others remain lit all the time ?



(A) A **(B)** B

(C) C **(D)** D

19. **Aparna measured the length of the shadow formed by a pole at different time of the day. The table given below shows the measurements that she recorded from her observations.**



Time	8.00 am	10.00 am	12.00 pm	2.00 pm
Length of shadow	60 cm	20 cm	5 cm	15 cm

If the length of the shadow was measured at 9.00 am, which one of the following measurements is likely to be the length of the shadow?

(A) 70 cm **(B)** 40 cm **(C)** 15 cm **(D)** 10 cm

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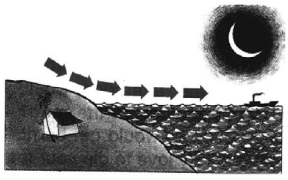
20. **What will be the correct statement for the given figure?**

(A) It occurs in daytime.
(B) Cooler air over the sea rushes towards the land to take its place.
(C) At night the sea is warmer than the land.
(D) Both (A) & (B).



Land breeze

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21. **The height of our school building is 8 m 25 cm. This is same as _____.**

(A) 8025 cm **(B)** 825 cm **(C)** 8250 cm **(D)** 80025 cm

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22. **The motion of the wheels of a horse driven cart is _____.**

(A) Rectilinear **(B)** Translation
(C) Rotational **(D)** Rotational and translation

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23. **Which of the following absorbs light the best?**

(A) A mirror **(B)** A piece of white paper **(C)** A black wallet **(D)** A green leaf

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24. **A bulb glows when _____.**

(A) Current flows through its filament **(B)** It is heated
(C) Battery is replaced **(D)** Shown to light

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25. **The motion of the second hand of a clock is _____.**

(A) Circular **(B)** Rotational **(C)** Translatory **(D)** None of these

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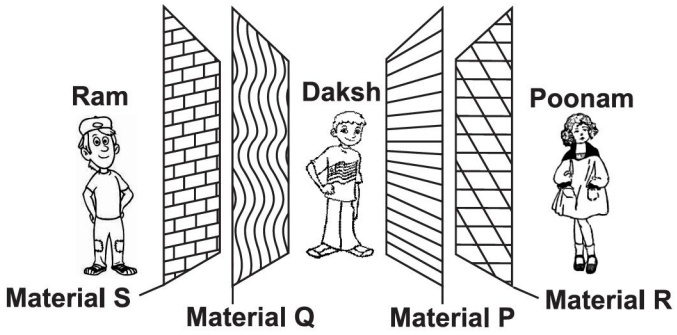
26.

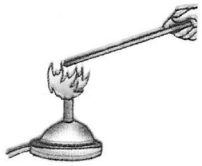


(i) **If material P is removed, Daksh will be able to see Poonam through material R.**
(ii) **If material R is removed, Poonam will not be able to see Daksh through material P.**
(iii) **If material S is removed, Ram is able to see blurred image of Daksh through material Q.**
(iv) **If material Q is removed, Daksh is not able to see Ram.**

Recognise the nature of the materials P, Q, R and S.

(A)	P : Transparent	Q : Translucent	R : Opaque	S : Transparent
(B)	P : Translucent	Q : Opaque	R : Transparent	S : Translucent
(C)	P : Opaque	Q : Translucent	R : Transparent	S : Opaque
(D)	P : Transparent	Q : Opaque	R : Translucent	S : Opaque

27. **Heat the following rods on flame from one end. Which of the following rods will not be hot at the other end?**



(i) **Aluminium rod** **(ii)** **Wooden rod**

(iii) **Steel rod** **(iv)** **Glass rod**

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

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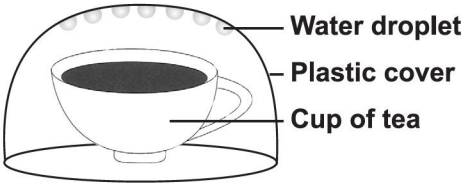
28. **Reena covered her cup of hot tea with a plastic cover and left it on the table. When she returned after 10 minutes, she observed that there were water droplets inside the plastic cover. Which of the following processes did not take place in the situation shown in the figure?**



(A) Cooling **(B)** Melting **(C)** Evaporation **(D)** Condensation

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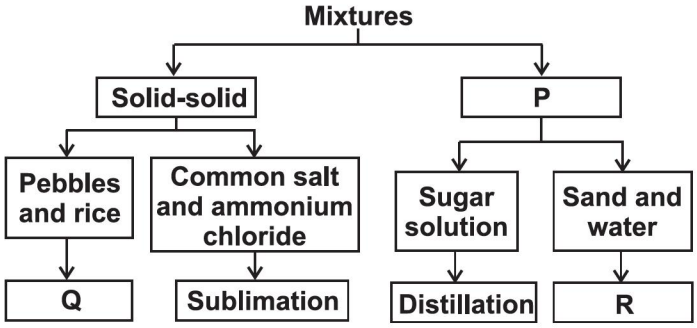
29. **P, Q and R in the given table are respectively**

	P	Q	R
(A)	Solid-liquid	Evaporation	Condensation
(B)	Liquid-gas	Sieving	Filtration
(C)	Gas-gas	Filtration	Sieving
(D)	Solid-liquid	Hand-picking	Filtration



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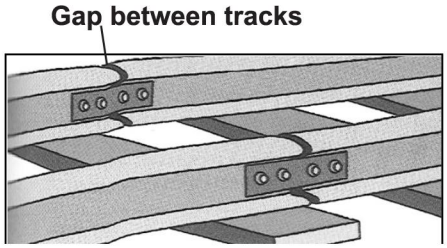
30. **Generally gaps are given between the railway tracks. Which of the following properties of metal explains this?**



(A) Metal contracts on heating.

(B) Metal expands on heating.

(C) Metal compresses on applying pressure.

(D) Shape of metal changes on heating.

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31. **Given in the table are some daily use items made up of more than one material. Match them and select the correct option.**

Daily use items		Material	
(i)	Cooking Pot	(p)	Wood
(ii)	Comb	(q)	Plastic
		(r)	Metal
		(s)	Glass
		(t)	Clay

(A) (i) - p, q, r ; (ii) - p, t, s

(B) (i) - r, s, t ; (ii) - p, q, r

(C) (i) - r, t ; (ii) - p, q, r **(D)** (i) - r, t ; (ii) - p, r, t

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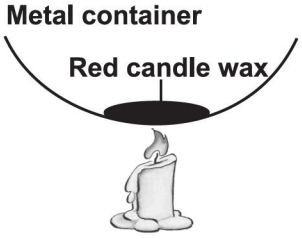
32. **Some wax was placed in a metal container. It was then heated as shown in the diagram. After a few minutes, there would be a change in the ____ of the wax.**



(i) **Colour** **(ii)** **State** **(iii)** **Shape**

(A) (i) and (ii) only **(B)** (ii) and (iii) only

(C) (i) and (iii) only **(D)** (i), (ii) and (iii)

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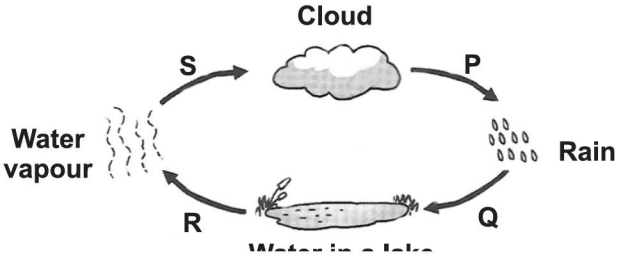
33. **Evaporation and condensation are taking place in the given diagram at the stages**



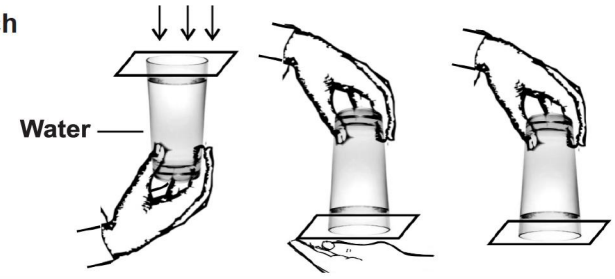
(A) P, Q

(B) Q, R

(C) R, S

(D) S, P

34. Ankita did an experiment shown in the figure. Which property can be explained by this experiment?



(A) Air moves up with large force.

(B) Air exerts pressure.

(C) Air is present everywhere.

(D) Water occupies space.

35. Which of the following are characteristics of plants that live in water ?

(i) Roots are poorly developed. **(ii) Stems and leaves are fleshy.**

(iii) Leaves are flat and coated with wax.

(iv) Stomata are present on both the surfaces of leaves.

(v) Stem is long and flexible.

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

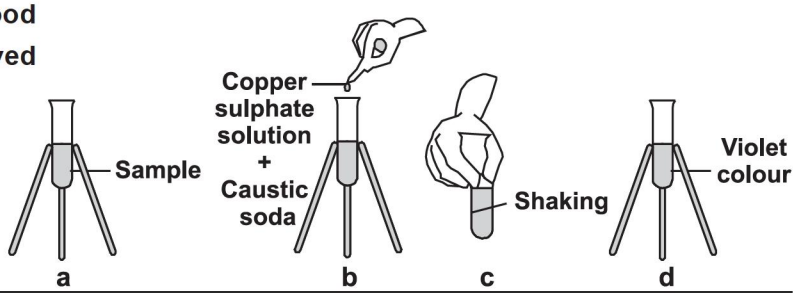
36. Examine the given test on a sample of food item. Which food component(s) is/are proved to be present in the sample ?

(A) Fat and carbohydrate

(B) Protein

(C) Protein and carbohydrate

(D) Carbohydrate



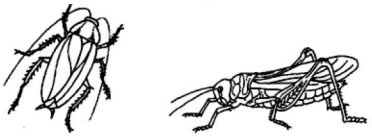
37. Which of the following characteristics describes the animals (i) & (ii) shown in the figure ?

(A) They live in aquatic habitat.

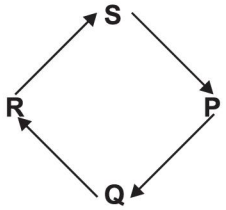
(B) They have three stages in their life cycle.

(C) They increase the fertility of the soil.

(D) They are nocturnal animals.



38. Each letter in the figure represents a stage in the life cycle of a butterfly. If Q is the adult stage then what stage is S ?



(A) Egg

(B) Pupa

(C) Larva

(D) Nymph

39. **"First day white, next day red, third day from my birth I'm dead".**

The above rhyme refers to _____.

(A) Jute fibre **(B)** Cotton flower **(C)** Silkworm **(D)** Coir fibre

40. What are the parts labelled X in the given figure?

(A) Prop roots

(B) Lateral roots

(C) Tap roots

(D) Fibrous roots

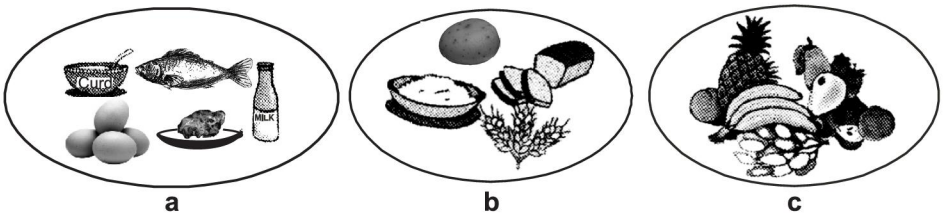
41. Examine the given figures. Which is roughage-rich food ?

(A) a

(B) b

(C) c

(D) a, b & c



a b c

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42. Match Column I with Column II and select the correct option from the codes given below.

	Column I		Column II
(a)	**Iodine**	**(i)**	**For proper functioning of the nervous system**
(b)	**Calcium**	**(ii)**	**For the formation of red blood corpuscles**
(c)	**Iron**	**(iii)**	**For strong bones and teeth**
(d)	**Sodium**	**(iv)**	**For the secretion of thyroid hormone**
		(v)	**For making energy-rich compounds (ATP)**

(A) a-(v), b-(iv), c-(i), d-(iii) **(B)** a-(iv), b-(iii), c-(v), d-(ii)

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

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43. What is the device shown in the figure used for ?

(A) Spinning

(B) Ginning

(C) Weaving

(D) Shearing

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

Statement 1 : Woollen clothes are worn in cold weather.

Statement 2 : Wool fibres have less air spaces and hence entrap heat.

(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.

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45. Which of the following statements are correct ?

(i) The pelvic girdle of female is wider than that of a male.

(ii) Femur or thigh bone is the longest bone in the human body.

(iii) Sternum protects the brain.

(iv) Human beings do not have endoskeleton.

(A) (i) & (ii) **(B)** (ii) & (iii) **(C)** (iii) & (iv) **(D)** (i) & (iv)

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46. Three students gave the following statements in a classroom discussion.

Abhishek	**: Always wash fruits and vegetables after cutting or peeling them.**
Misha	**: Overcooking and reheating the same food improves nutrient content.**
Suneel	**: Excessive washing of rice and pulses may remove vitamins and minerals present in them.**

Which student(s) made incorrect statement(s) ?

(A) Abhishek & Misha **(B)** Misha & Suneel **(C)** Abhishek & Suneel **(D)** Suneel only

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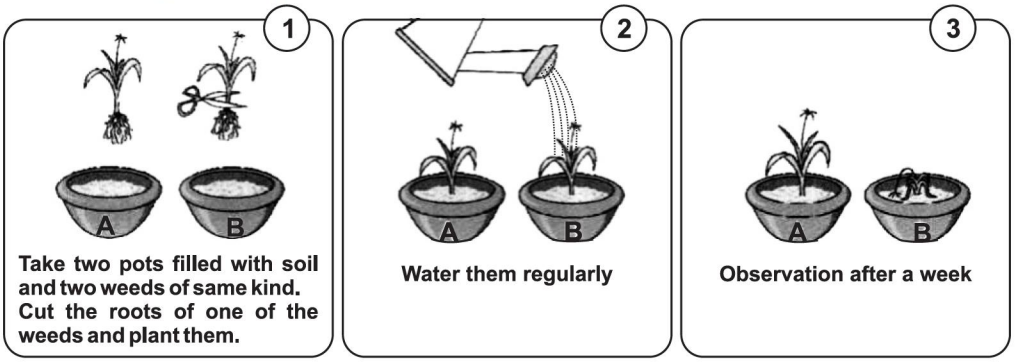
47. Which of these body movements is not voluntary movement ?

(A) Walking and running **(B)** Beating of the heart

(C) Biting and chewing **(D)** Writing

48. Divya performed the given experiment.



What does her experiment prove ?

(A) Roots anchor the plant.

(B) Roots absorb water and transport it to all parts of the plant.

(C) Stem conducts water from roots to various parts of the plant.

(D) Stem transports the various nutrients dissolved in water to different parts of the plant.

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49. Which of these is a common feature between fish and birds ?

(A) Hollow and light bones **(B)** Respiration by lungs

(C) Streamlined body **(D)** 2-chambered heart

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50. Latika's teacher gives her a plant with the following characteristics.

(i) The stem is covered with a thick waxy layer and is swollen and fleshy.

(ii) The leaves are in the shape of spine.

Latika's teacher then gives her a task to match an animal that lives in the same habitat where the given plant is found. Which of the following animals should Latika select ?

(A) Snow leopard **(B)** Camel **(C)** Yak **(D)** Zebra

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

15th NSO

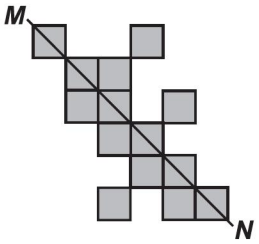
LEVEL - 2

Year 2012-13

CLASS24

MENTAL ABILITY

1. What is the smallest number of squares that must be added so that the line *MN* becomes a line of symmetry?



(A) 4
(B) 5
(C) 6
(D) 7

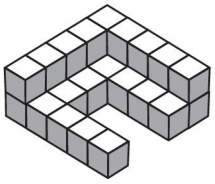
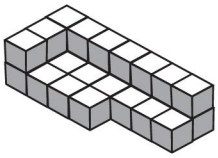
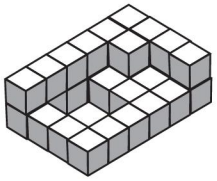
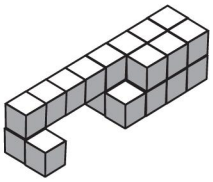
2. I am a number between 20 and 30. If you divide 47 and 92 by me, the remainders are 3 and 4, respectively. What number am I?

(A) 21 (B) 23 (C) 22 (D) 24

3. 378 Indian stamps and 588 foreign stamps were pasted in an album in such a way that each page had either Indian or foreign stamps on it. What is the maximum number of stamps that were pasted on each page if the number of stamps were the same on each page?

(A) 1874 (B) 6048 (C) 21 (D) 42

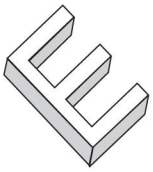
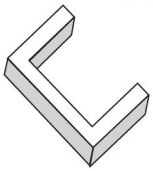
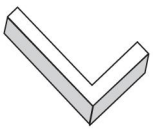
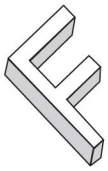
4. Which of the following solids is made up of the greatest number of unit cubes?

(A) 
(B) 
(C) 
(D) 

5. Anusha and Priya were given some candies in the ratio 4 : 7. Priya ate 9 candies, she still had 15 candies more than Anusha. How many candies did Anusha have?

(A) 30 (B) 32 (C) 41 (D) 15

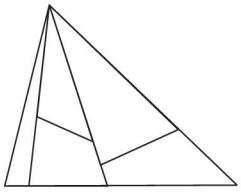
6. Which of the following solids has the greatest number of faces?

(A) 
(B) 
(C) 
(D) 

7. A rope is 82.03 m long. John cut off 3.28 m. Then, he cut the remaining rope into 100 pieces of equal length. What is the length of each piece?

(A) 0.07875 cm (B) 0.7875 cm (C) 7.875 cm (D) 78.75 cm

8. How many angles in the given figure are less than 90°?



(A) 11
(B) 12
(C) 13
(D) 14

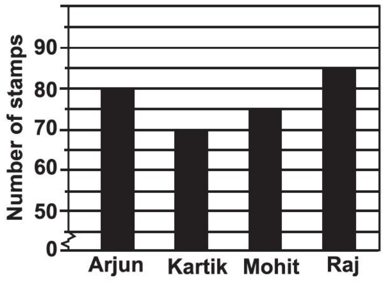
9. A set of numbers is given below :

358 426 853 674 592

If 1 is subtracted from the middle digit of each number and then the numbers are arranged in descending order, what will be the sum of the digits of the newly formed second number?

(A) 16 (B) 15 (C) 11 (D) 12

10. **The bar graph shows the number of stamps collected by four boys. Who has $\frac{15}{62}$ of the total number of stamps collected by the four boys?**



(A) Arjun
(B) Kartik
(C) Mohit
(D) Raj

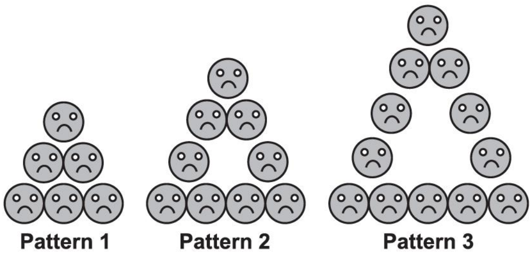
---

11. **Pointing to a woman in a photograph, a man says, "She is the mother-in-law of the husband of the only grand-daughter of my own mother-in-law". How is the woman related to the man?**

(A) Daughter **(B)** Wife **(C)** Sister-in-law **(D)** Niece

---

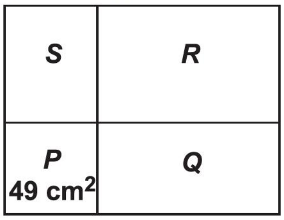
12. **How many sad faces will there be in Pattern 99 ?**



(A) 300
(B) 191
(C) 980
(D) 120

---

13. **The big rectangle is divided into four parts. *P* is a square. The area of *Q* is thrice that of *P*. The area of *R* is 42 cm² more than the area of *Q*. What is the perimeter of the big rectangle?**



(A) 90 cm
(B) 76 cm
(C) 80 cm
(D) 88 cm

---

14. **Replace * by the given options to make the statement true.**

$$(-6) + (-9) - (-12) - 12 + 8 - 3 \boxed{*} (-6) - (-9) - (-12) + 12 - 8 + 3$$

(A) > **(B)** < **(C)** = **(D)** Can't be determined

---

15. **A dog jumps 4 times during the time when a hare jumps 5 times. But the distance covered by the dog in 3 jumps is equal to that covered by the hare in 4 jumps. What is the ratio of the speeds of the hare and the dog ?**

(A) 5 : 3 **(B)** 15 : 16 **(C)** 4 : 5 **(D)** 12 : 18

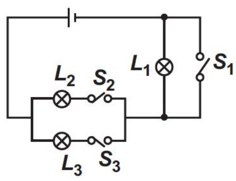
SCIENCE

16. **Light rays undergo regular reflection at ________.**

(A) A piece of cloth **(B)** The Moon surface
(C) A whitewashed wall **(D)** The calm surface of a lake

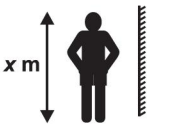
---

17. **Which of the following statements about the circuit is correct?**



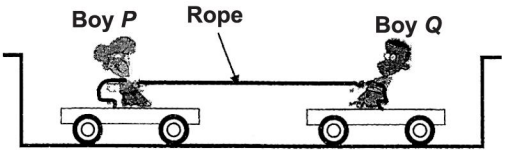
(A) Lamp L_1 will light up when either L_2 or L_3 are lighted.
(B) Electricity will flow only when all the switches are closed.
(C) Current flowing through L_1 and L_2 are equal.
(D) Electricity will flow as long as any one switch is closed.

18. Study the diagram. Raj is standing in front of the plane mirror. What is the minimum height of the mirror so that he can see himself completely in the mirror?



(A) *x* m **(B)** Half of *x* m
(C) More than *x* m **(D)** Can't say

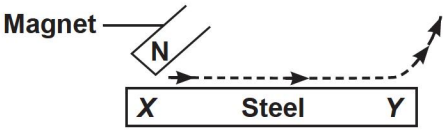
19. Two boys played 'tug-of-war' on movable planks. When the two boys started pulling, they moved the same distance backwards. What is the likely reason that caused them to move the same distance backwards?



(A) Boy *P* applied a greater amount of force than Boy *Q*.
(B) The two boys applied the same amount of force on the rope.
(C) The gravitational force pulled the two boys down to the ground.
(D) The frictional force between the two boys and their movable planks stopped them from moving.

20. A piece of steel can be magnetised by stroking it with a magnet.
When the magnet is moved in the direction shown, which poles are produced at *X* and at *Y*?

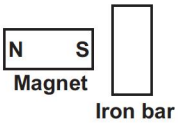
	X	*Y*
(A)	North	North
(B)	North	South
(C)	South	North
(D)	South	South



21. The passengers sitting in a flying aeroplane are in ____ with respect to clouds, but are in ____ with respect to the interior of the aeroplane.
(A) Rest, motion **(B)** Rest, rest **(C)** Motion, rest **(D)** Motion, motion

22. The earth wire of an electric appliance should be connected to the _____.
(A) Fuse **(B)** Metal case **(C)** On/Off switch **(D)** Plastic handle

23. An iron bar is placed near a magnet as shown.
Which diagram correctly shows the induced magnetisation of the iron bar?



(A) 

(B) 

(C) 

(D) 

24. An example of rotational motion is _____.
(A) The moon revolving around the Earth **(B)** Rotation of the Earth
(C) A child in merry-go-round **(D)** The bob of a swinging pendulum

25. Suppose the Earth begins to rotate twice as fast. Which of these would happen in this condition?
(A) Days would be twice as long. **(B)** The Sun would rise and set in the east.
(C) Days would be half as long. **(D)** Some places would have eight seasons in a year.

26. Arjun was given a saturated solution of sugar. He was asked to dissolve two more spoons of sugar into the saturated solution. His four friends suggested him to do the following before adding more sugar.
(I) Stirr the solution for longer time **(II) Divide the solution into two separate glasses**
(III) Add more water to the solution **(IV) Heat the solution**
Which of his friend's suggestion(s) will help him in dissolving more sugar?
(A) I and II **(B)** II and III **(C)** III and IV **(D)** IV only

27. Shopkeepers store eatables in X containers so that buyers can easily see them while some other materials are stored in metal containers Y. Identify X and Y respectively.

(A) Transparent, transparent **(B)** Opaque, opaque

(C) Transparent, opaque **(D)** Opaque, transparent

---

28. Match the columns and choose the correct option.

Column-I (Mixtures)	Column-II (Separation Techniques)
(P) Oil and water	**(I)** Winnowing
(Q) Soil and water	**(II)** Evaporation
(R) Salt and water	**(III)** Decantation
(S) Powdered leaves and sand	**(IV)** Filtration

(A) (P)-(IV), (Q)-(I), (R)-(III), (S)-(II) **(B)** (P)-(II), (Q)-(I), (R)-(IV), (S)-(III)

(C) (P)-(III), (Q)-(IV), (R)-(II), (S)-(I) **(D)** (P)-(IV), (Q)-(II), (R)-(I), (S)-(III)

---

29. Rishab came back home after a few days. He observed the following:

(P) Juice in bottle kept in refrigerator was freezed.

(Q) The food kept in kitchen was spoiled.

Which of the following is true for P and Q?

(A) P and Q are physical changes.

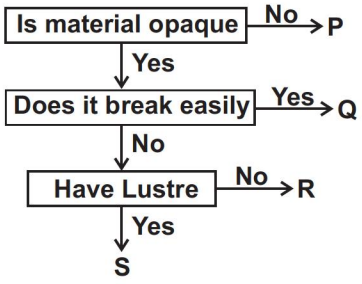
(B) P and Q are chemical changes.

(C) P is a physical change and Q is a chemical change.

(D) P is a chemical change and Q is a physical change.

---

30. Study the given flowchart carefully and identify the material S.



(A) Wood

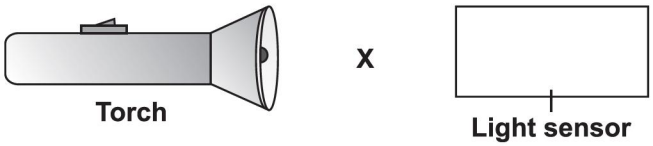
(B) Notebook

(C) Glass

(D) Iron rod

---

31. Geeta set up an experiment as shown below to find out how much light can pass through different materials.



She placed four materials K, L, M and N, one at a time at position X. She then recorded the intensity of light detected by the light sensor in the table below.

Material	Intensity of light detected (%)
K	32
L	41
M	11
N	78

Which material should she use if she wants to make curtains for her bedroom to keep out the sunlight?

(A) K **(B)** L **(C)** M **(D)** N

32. Vidhi has three beakers, X, Y and Z with equal amount of water at different temperatures. She dissolved equal amount of sugar in all the beakers. After 5 minutes of stirring, she filtered the solutions to remove the undissolved sugar. She obtained 0.5 g sugar from X, 1.8 g sugar from Y and 1.2 g of sugar from Z. Which of the three beakers has water at the highest temperature?

(A) X **(B)** Y **(C)** Z **(D)** Both X and Y

---

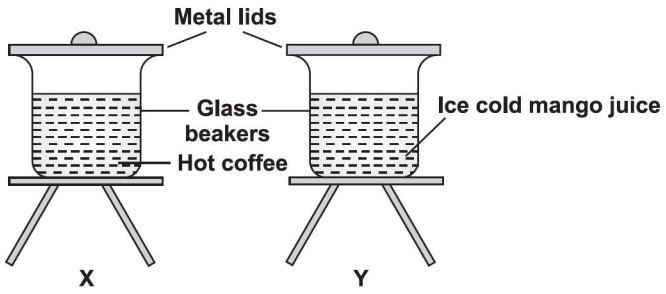
33. The two beakers, X and Y were left on the table. After 10 minutes, what will you observe?

(A) Water droplets are formed inside the beaker X and outside the beaker Y.

(B) Water droplets are formed outside the beaker X and inside the beaker Y.

(C) Water droplets are formed only on beaker X.

(D) Water droplets are formed only on beaker Y.



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34. Study the following table. Identify the change(s) listed under the wrong heading.

Physical Changes		Chemical Changes	
1.	Freezing ice cream	4.	Souring of food
2.	Whipping cream	5.	Dissolving sugar for making lemonade
3.	Squeezing oranges for juice	6.	Burning petrol in a car

(A) 2 and 3 **(B)** 2 and 5 **(C)** 2 **(D)** 5

---

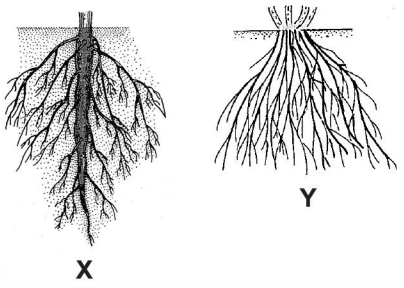
35. The given figure shows two different types of root system *i.e.*, X and Y. Which of the following options is correct regarding them?

(A) Younger sidewards roots of these root systems are called lateral roots.

(B) The Y type of root system provides greater anchorage to the plant.

(C) Mostly plants showing reticulate venation possess X type of root system.

(D) The food storing root of turnip is a modification of Y type of root system.



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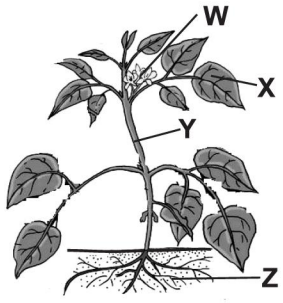
36. Refer the given figure of a typical flowering plant and select the option that correctly fills the blank in following statement.

We may not be able to see new plants of the same type if the part labelled _____ is removed.

(A) W
(B) X
(C) Y
(D) Z



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37. The given table shows the degree of angular movement shown by three different skeletal joints X, Y and Z.

Which of the following statements is correct regarding this?

(A) Joint X can be the joint between shoulder bone and arm.

(B) Joint Y can be the elbow joint.

(C) Joint Z can be the joint between upper jaw and rest of the skull.

(D) All of these

Skeletal joint	Degree of movement
X	360°
Y	180°
Z	0°

---

38. Animals that undergo hibernation in winters get energy by utilizing _____ stored in their bodies.

(A) Fats **(B)** Carbohydrates **(C)** Proteins **(D)** Both (A) and (B)

39. Which of the following is incorrect regarding skeletal support system of different organisms?

(A) Earthworms have liquid skeleton where liquid filled spaces inside body serve as support system.

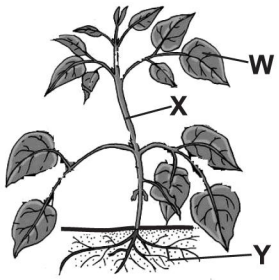
(B) Skeletal muscles work in pairs, when one muscle of a pair contracts, the other relaxes.

(C) Snakes and other limbless animals have bristles on body's under surface that support movement.

(D) The birds have hollow bones with air filled cavities that assist in flying.

---

40. Surabhi was comparing plant Q with a typical flowering plant shown in figure. She made the following observations about plant Q.



1. Part X is swollen, fleshy and green.

2. Watery material squeezes out when part X is broken.

3. Part W shows a great reduction in size.

4. Part Y penetrates to deep levels in soil.

These observations suggest that plant Q is most likely to be found in

(A) Plains along a river **(B)** Ponds **(C)** Evergreen forests **(D)** Deserts

---

41. Aquatic habitats (freshwater or marine) sustain various organisms including mammals, amphibians, etc., each with different kinds of adaptations. Which of the following is incorrect regarding these adaptations?

(A) Blowholes and lungs are the respiratory organs of many aquatic mammals.

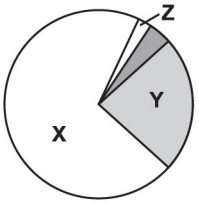
(B) Dorsoventrally flattened body is found in many deep sea fishes in order to cope with high pressure.

(C) Many aquatic animals either have streamlined bodies or make their bodies streamlined while swimming.

(D) Gills are the organs of respiration in essentially all fishes.

---

42. The given pie chart shows relative amount of three main gases (X, Y and Z) in the air. Which of the following statements is correct regarding this?



(A) X is a major component of most of the fertilizers.

(B) Y is the gas that is used in photosynthesis.

(C) Z represents the gas that is used in respiration of plants.

(D) X and Y do not dissolve in water.

---

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

Statement 1 : Weaving and knitting are two different processes of cloth making.

Statement 2 : Weaving involves the use of a single yarn while knitting involves use of two sets of yarn.

(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.

(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.

(C) Statement 1 is correct but statement 2 is incorrect.

(D) Both statements 1 and 2 are incorrect.

---

44. A person living in a humid region like equatorial regions would prefer to use clothes made up of _____.

(A) Nylon as it is stronger, light and does not wrinkle. **(B)** Wool as it is fluffy and soft.

(C) Jute as it has a good power of absorption. **(D)** Cotton as it allows moisture to go through it.

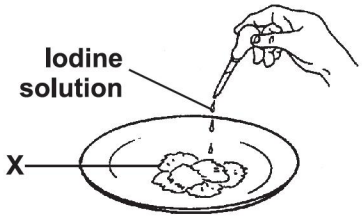
---

45. Which of the following is an incorrect match of the articles and the fibres used in their production?

(A) Mountain climbing ropes – Nylon **(B)** Blankets – Wool

(C) Banknotes and high quality paper – Cotton **(D)** None of these

46. Aditya was testing a food sample X as shown in the given figure. Which of the following statements is correct regarding this?

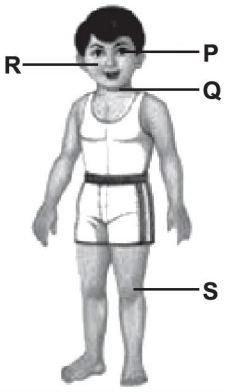


(A) X can be boiled egg if the sample turned blue-black.
(B) X can be raw meat if the sample did not change colour.
(C) X can be raw potato slices if the sample turned blue-black.
(D) Both (B) and (C)

47. Select the option which on reshuffling gives the name of the food component that does not provide nutrients but aids in digestion.

(A) umcacil **(B)** egouarhg **(C)** setaegelbv **(D)** roptiesn

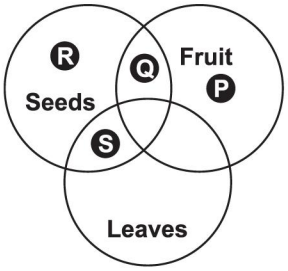
48. Match Column-I with Column-II in context of the given figure and select the correct option from the codes given below.



Column-I (Nutrient deficient in diet)	Column-II (Effect on body)
(a) Vitamin D	(i) Bending of bones of part S
(b) Iodine	(ii) Swelling in part R
(c) Vitamin A	(iii) Swelling of part Q
(d) Proteins	(iv) Improper functioning of part P

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

49. The given Venn diagram represents some plants (P, Q, R and S) based on their edible parts.
Select the option which most correctly defines their position in the chart.



(A) P-Mustard, R-Fenugreek **(B)** P-Rice, Q-Apple
(C) S-Fenugreek, Q-Tomato **(D)** P-Spinach, S-Coriander

50. Read the given statements and select the correct option.
Statement 1 : Biodegradable wastes are also known as organic wastes.
Statement 2 : The origin of biodegradable wastes are living organisms.

(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
(C) Statement 1 is correct but statement 2 is incorrect. **(D)** Both statements 1 and 2 are incorrect.

SPACE FOR ROUGH WORK

CLASS24

SCIENCE OLYMPIAD FOUNDATION

16th NSO

LEVEL - 2

Year 2013-14

MENTAL ABILITY

1. Which of the following steps is/are incorrect while constructing an angle of 120°?

   Step 1 : Draw any line MN and take a point C on line.

   Step 2 : Place the pointer of the compass at C and draw an arc of convenient radius which cuts the line at A.

   Step 3 : Without disturbing the radius on the compass draw an arc with A as centre which cuts the first arc at B.

   Step 4 : Again without disturbing the radius on the compass and with M as centre, draw an arc with O which cuts the first arc at C.

   Step 5 : Join OA. $\angle OAN$ is the required angle of measure 120°.

   A. Only step 1
   B. Both step 4 and step 5
   C. Only step 5
   D. Only step 2

2. There are 18 girls and 24 boys in a class. $\frac{2}{3}$ of the girls and $\frac{5}{12}$ of the boys play the piano. Find the ratio of the number of girls who play the piano to the total number of pupils who do not play the piano in the class.

   A. 3 : 7
   B. 3 : 5
   C. 5 : 6
   D. 3 : 4

3. A car can travel 315 km on 30 litres of petrol. How far can the car travel if it has 50 litres of petrol in its petrol tank?

   A. 105 km
   B. 189 km
   C. 525 km
   D. 840 km

4. The sports teacher decided that the base of a swimming pool measuring 4.2 m by 3.6 m should be covered by rectangular tiles measuring 12 cm by 7 cm. Find the number of tiles required.

   A. 1700 tiles
   B. 1800 tiles
   C. 1500 tiles
   D. 1600 tiles

5. Mrs. Kapoor had x m of ribbon. She cuts off 6 pieces of ribbon from it, each measuring 3 cm. What was the length of the ribbon left?

   A. $(x - 9)$ cm
   B. $(x - 18)$ cm
   C. $(100x - 18)$ cm
   D. $82x$ cm

6. In a certain code, '*you are*' means '*Se Pa*', '*see you*' means '*La Se*' and '*parrots are*' means '*Ni Pa*'. What does '*see parrots*' mean in that code language?

   A. *La Pa*
   B. *La Ni*
   C. *Se Ni*
   D. Can't be determined

7. Find out the wrong term in the number series below.

   46080, 3840, 384, 48, 24, 2, 1

   A. 384
   B. 48
   C. 24
   D. 2

8. A roll of material was $11\frac{3}{5}$ m long. The tailor cuts off $2\frac{3}{5}$ m to make some curtains. The remaining material was made into several cushions which used 75 cm of material each. How many cushions did he make?

   A. 12
   B. 24
   C. 16
   D. 20

9. A merchant has 120 litres of oil of one kind, 180 litres of another kind and 240 litres of third kind. He wants to sell the oil by filling the three kinds of oil in tins of equal capacity. What should be the greatest capacity of such a tin?

   A. 80 litres
   B. 60 litres
   C. 75 litres
   D. 90 litres

10. Mohit had twice as much money as Rohan. After Mohit bought chocolates that costs ₹ 118.30 and Rohan bought a pen that costs ₹ 31.90, Rohan had 3 times as much money as Mohit. How much money had Mohit left?

    A. ₹ 9.90
    B. ₹ 10.90
    C. ₹ 21.80
    D. ₹ 54.50

11. Answer the following question based on the five words given below.

LAP BUT CAR SON HID

(The new words formed after performing the mentioned operations may or may not be meaningful English words).

If the positions of the first and the third alphabets of each of the words are interchanged, which of the following would form a meaningful word in the new arrangement?

A. HID
B. SON
C. Both LAP and BUT
D. CAR

12. Pointing to a photograph, a man said to a woman, "She is one of the sisters of the son of the only son of your grandfather." If the woman in the photograph is the sister of the son of the man's father-in-law, then how is the man related to the woman (with whom the man was talking)?

A. Husband
B. Brother
C. Brother-in-law
D. Either A or C

13. Find the value of

$-12 + (-98) - (-84) + (-7) - [(-15 + (-2)]$.

A. 16
B. 14
C. –16
D. –15

14. Study the following information carefully and answer the question given below:

A, B, C, D, E, F, G and H are sitting around a circle facing at the centre. C is third to the left of A and second to the right of E. B is second to the right of C. D is second to the right of F who is second to the right of A. G is not an immediate neighbour of C.

Who is third to the right of H?

A. E
B. F
C. D
D. G

15. Which of the following statements is true about prime numbers?

A. There are finite number of prime numbers.
B. Every prime number is odd.
C. There is no largest prime number.
D. A whole number is either prime or it can be expressed as a product of primes.

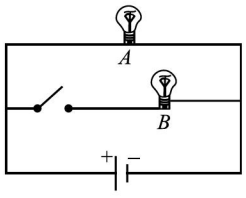
SCIENCE

16. The numerical ratio of distance to displacement is _____.

A. Always equal to one
B. Always less than one
C. Always greater than one
D. Equal to or more than one.

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

Statement-1 : The brightness of the bulb *A* remains the same after the switch is closed.



Statement-2 : The voltage across elements in parallel is the same.

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.

18. Which of the following factors affects the period of a simple pendulum?

(i) Mass of the pendulum bob
(ii) Number of oscillations
(iii) Length of the pendulum

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

19. A small cardboard is kept between the wall and the bulb in a room. At which position the shadow formed is sharp?

A. The cardboard is held close to the wall.
B. The cardboard is held at mid position between them.
C. The cardboard is held close to the bulb.
D. Both A and C

20. Which of the following is correct for weightless of an astronaut moving in a satellite?

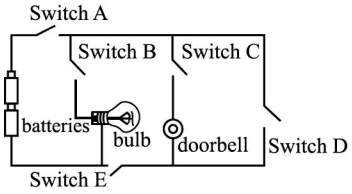
A. Free fall
B. No gravity
C. Zero mass
D. None of these.

21. If a pith ball is repelled by a rubber rod, what can be deduced about the charges on the pith ball and the rubber rod?

A. Only the rod is charged.
B. Only the pith ball is charged.
C. Either the rod or the pith ball is charged but not both.
D. Both the rod and the pith ball carry charges of the same sign.

---

22. In given figure, which of the following switches need to be closed to change electrical energy to only sound energy?



A. A, B and C
B. A, C and E
C. A, B, C and E
D. A, B, D and E

---

23. Asha observes her own shadow at different times of the day and finds that her shadow is shortest at _____.

A. 5 p.m.
B. 12 noon
C. 10 a.m.
D. 8 a.m.

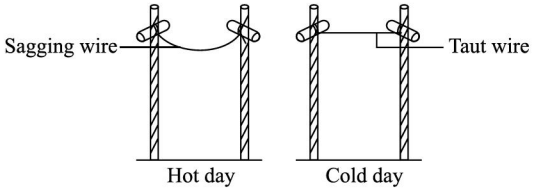
---

24. In which of the following examples of motion can the body be considered approximately a point object?

A. A monkey sitting on top of a man cycling smoothly on a circular track.
B. A spinning cricket ball that turns sharply on hitting the ground.
C. A tumbling beaker that has slipped off the edge of a table.
D. None of these.

---

25. A metal wire was tied between two wooden poles.



The given figures show the observations during different weather conditions.

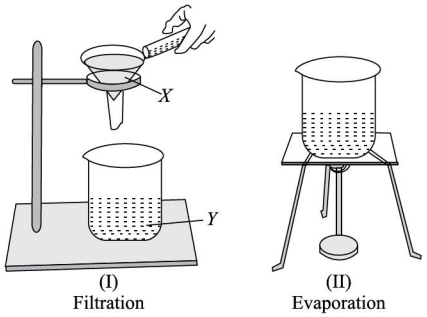
What do you infer from the figures?

A. The wooden poles expand on hot days.
B. The wooden poles contract on cold days.
C. The metal wire expands on cold days.
D. The metal wire contracts on cold days.

26. There are two mixtures P and Q with the following compositions.

Mixture	Components
P	$X + Y$
Q	$Z + Y$

The components of P mixture are separated by technique I while for Q mixture, technique II is used as shown in the figures.



Select the correct statement among the following.

A. If more of X is dissolved in Y, then a saturated solution is formed.
B. Z and Y can also be separated by sedimentation and decantation.
C. Y is a common solid particle in both the mixtures.
D. If a mixture of X and Z is formed, then more than one method is used to separate the components.

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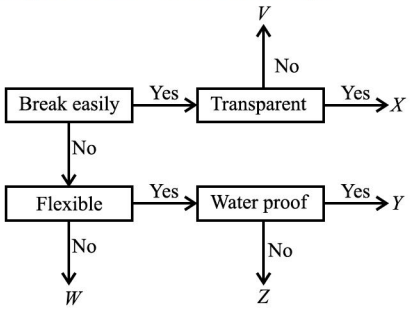
27. Study the given flow chart carefully.



Which of the materials in the flow chart match to the glass and eraser respectively?

A. V and X
B. X and Y
C. Z and V
D. Y and X

---

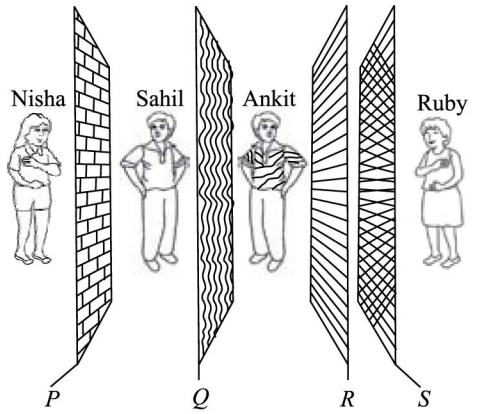
28. Study the given changes carefully.

I. Heating a black material (*tar*) for repairing a road.
II. Heating a bowl containing ice.
III. Hardening of plaster of Paris on drying.

Which of the above changes cannot be reversed?

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

29. Different types of sheets are placed between Nisha, Sahil, Ankit and Ruby.



Sheets Q and S allow light to pass through them. Sheets P and R are opaque. Select the incorrect statement among the following.

A. Nisha cannot see Sahil.
B. Sahil can see Ankit.
C. If sheet S is removed then Ruby cannot see Ankit.
D. Ankit can see Nisha.

30. Namita grouped few objects in different ways.

Group	Objects
1	Steel spoon, Copper wire
2	Cotton, Sponge
3	Books, Newspaper
4	Aluminium, Gold

Which one of the following options contains the correct property according to which the objects are categorised into the given group(s)?

A. Groups 1 and 4 : Lustre
B. Groups 2 and 3 : Transparent
C. Group 4 : Floating
D. Group 2 : Hardness

31. Match Column I with Column II and select the correct option from the codes given below.

	Column I		Column II
(i)	Stones from grain	p.	Threshing
(ii)	Grain seeds from stalks	q.	Winnowing
(iii)	Pebbles from sand	r.	Handpicking
(iv)	Sand and sawdust	s.	Sieving

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

32. Identify the process/property from their descriptions.

1. Settling of heavier component in a mixture after water is added.
2. No more salt can be dissolved in the salt solution.

A. Decantation, Insolubility
B. Filtration, Condensation
C. Sedimentation, Saturation
D. Saturation, Filtration

33. Study the given table to answer the following questions.

Animal	Habitat	Adaptation	
Beluga whale	Arctic water	1.	Layer of fat called blubber
Peacock	Forest	2.	Bright tail feathers
Alligator	Fresh water	3.	Eyes on top of head
Reindeer	Cold areas	4.	Thick fur
Humming bird	Rainforest	5.	Long tongue

(a) Which two animals in the table have adaptations that help them stay warm in their environments?
(b) Which adaptation allows an animal to find prey while submerged in water?
(c) Which adaptation might help an animal attract a mate?

	(a)	(b)	(c)
A.	Beluga whale, Reindeer	5	5
B.	Reindeer, Humming bird	3	2
C.	Peacock, Alligator	2	1
D.	Beluga whale, Reindeer	3	2

34. Amit uprooted a plant and found fleshy tubers in roots as shown in the figure. What could he infer about the plant by observing the roots?

A. The root system do not penetrate deep in the soil. Both main roots and their branches are thin and thread-like.
B. The plant has leaves with reticulate venation only.
C. The root system follows acropetal orientation *i.e.,* the youngest towards growing point and oldest towards the base of the main root.
D. Both B and C.

35. Match the following and select the correct option

Assertion		Reason
(a) Woollen clothes are worn in cold weather.	(i)	It has good absorbing quality.
(b) Jute is used to make containers for young saplings that can be planted directly.	(ii)	It is a fluffy fibre.
(c) Silk is greatly prized.	(iii)	It is hard, rough and brittle.
(d) Cotton is used to make wicks for oil lamps.	(iv)	It has less air space in it.
(e) Coir is used to make mats, ropes, floor coverings, etc.	(v)	It is biodegradable.
	(vi)	It grows best in warm, humid climate with plenty of rainfall.
	(vii)	It gives shimmering appearance.

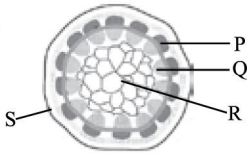
A. a-(iv), b-(iii), c-(vi), d-(iv), e-(ii)
B. a-(ii), b-(v), c-(vii), d-(i), e-(iii)
C. a-(i), b-(vi), c-(iv), d-(ii), e-(vii)
D. a-(ii), b-(vii), c-(iii), d-(v), e-(iv)

36. ____ and ____ are needed to build our bones and teeth. ____ helps in making haemoglobin in our blood. ____ is needed by the body to prepare thyroid hormone. _____and ____ help in maintaining the fluid balance in the body.

Select the correct sequence of words to complete the above given passage.

A. Calcium, Phosphorus, Iron, Iodine, Sodium, Potassium
B. Sodium, Potassium, Iodine, Iron, Phosphorus, Calcium
C. Calcium, Phosphorus, Potassium, Sodium, Iron, Iodine
D. Calcium, Potassium, Iron, Sodium, Phosphorus, Iodine

37. The diagram below shows the cross-section of a stem of a plant.



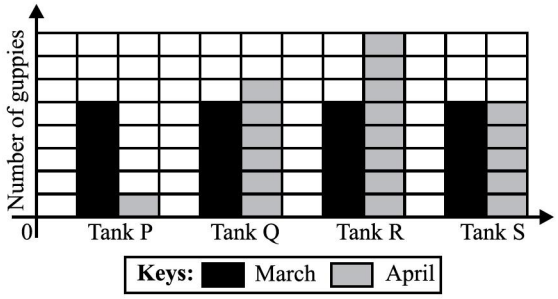
What will you observe when the plant stem is cut after being submerged in blue dye for a day?

A. Part P is stained blue.
B. Part Q is stained blue.
C. Part R is stained blue.
D. Part S is stained blue.

38. Deficiency of which of these will cause anaemia?

A. Vitamin A and calcium
B. Vitamin B_{12} and iron
C. Vitamin K and phosphorus
D. Vitamin D and iron.

39. The graph below shows the number of guppies in four tanks, P, Q, R and S, at the end of March and April.



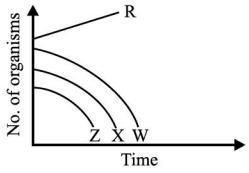
Which one of the following statements is false?

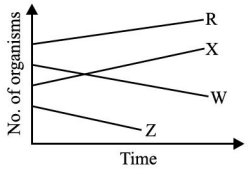
A. Predators may have been introduced into Tank P in April.
B. All the guppies in Tank S could have been either male or female only.
C. There were more guppies born in April in Tank R than Tank Q.
D. The death rates of guppies in Tank P and Tank R in April were greater than the birth rates.

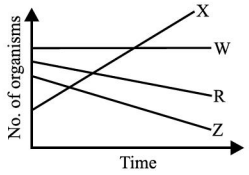
40. Study the food chain given below.

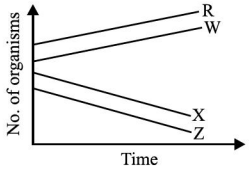
$$R \rightarrow W \rightarrow X \rightarrow Y \rightarrow Z$$

If organism Y is removed from the food chain above, which one of the following graphs shows the changes in the other populations?

A.


B.


C.


D.


41. Study the given pattern carefully and select the one with same pattern.

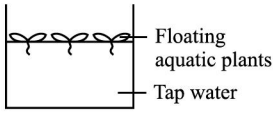
POTATO : SPINACH : ONION : CABBAGE

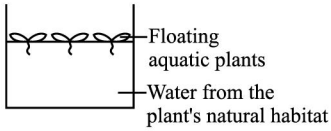
A. RADISH : CAULIFLOWER : CARROT : BROCCOLI
B. BANANA : TURNIP : RICE : SUGARCANE
C. MANGO : CORIANDER : WHEAT : APPLE
D. CARROT : TURNIP : RADISH : GINGER

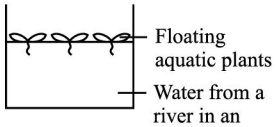
42. Bast fibres are found in the stems of the plants and provide strength to the plants. They are generally very long. Example of bast fibre is _____.

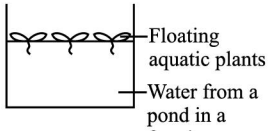
A. Flax
B. Hemp
C. Jute
D. All of these

43. A group of children wanted to find out the effect of four samples of water on the growth and reproduction of aquatic plants. Which beaker will have the least number of aquatic plants after three weeks?

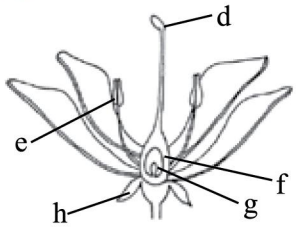
A. 

B. 

C. 

D. 

44. Refer the given figure showing vertical section of a flower and select the correct option regarding its labelled part(s).



A. If 'h' is removed at bud stage of flower, flower gets damaged.
B. During self pollination, the pollen grains are transferred from 'd' to 'e' of the same flower or a different flower in the same plant.
C. 'g' contains a very tiny egg which the pollen fertilizes.
D. Both A and C.

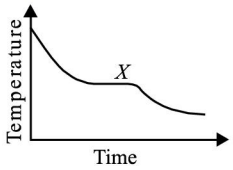
45. Which of the following statements are true and false?

(i) About 90% of the ozone in our atmosphere is contained in stratosphere.
(ii) The warmest parts of our atmosphere are located in mesosphere.
(iii) Trophosphere extends from Earth's surface upto 7 km at poles and 17-18 km at the equator.
(iv) The lowest part of thermosphere contains ionosphere.
(v) Hydrogen and helium are prime components of exosphere.

	True	**False**
A.	(i), (ii), (v)	(iii), (iv)
B.	(i), (iv), (v)	(ii), (iii)
C.	(ii), (iv)	(i), (iii), (v)
D.	(ii), (v)	(i), (iii), (iv)

ACHIEVERS SECTION

46. A hot liquid is carefully poured into a beaker. The graph shows how its temperature changes as it cools towards room temperature.



What processes are likely taking place at region X?

A. Boiling and evaporation.
B. Condensation only.
C. Evaporation only.
D. Solidification and evaporation.

47. Fill in the blanks of the given paragraph by choosing the correct option.

To fix the wooden handle into the ring of iron blade in tools, the ring is __*p*__, which causes its __*q.*__ After fitting the handle easily into the ring, the ring __*r*__ on __*s*__ and fits tightly into the handle.

	p	***q***	***r***	***s***
A.	Heated,	Contraction,	Expands,	Heating
B.	Cooled,	Contraction,	Expands,	Cooling
C.	Heated,	Expansion,	Contracts,	Cooling
D.	Cooled,	Expansion,	Contracts,	Heating

DIRECTION Q. No. 48 and 49 : Read the given passage and answer the questions that follow.

The polar regions are covered with snow. There may also be snowfall in mountain regions during the winter. The trees growing on mountains are cone-shaped, with sloping branches. Many of them, such as pine, have sharp needle-like leaves. Animals living on mountains have thick skin or fur to protect themselves from cold, *e.g.,* yaks and snow leopards.

48. What other adaptation(s) of animals is/are observed in the colder areas?

A. Birds and mammals of colder areas are larger in size as compared to their equivalents in warmer areas.

B. Animals of colder areas have shorter extremities (*e.g.*, tail, ears, feet) as compared to animals in warmer areas.

C. Birds of colder areas have broader wings.

D. Both A and B.

49. Why do pines have sharp needle-like leaves?

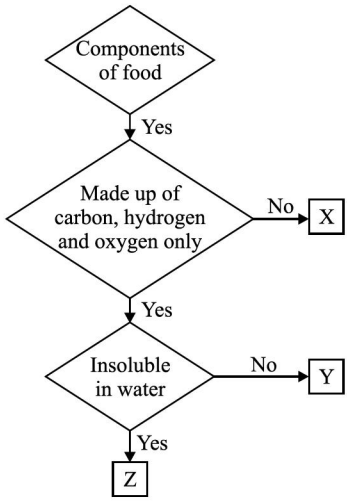
A. This reduces loss of water due to transpiration.

B. This reduces chances of catching forest fire.

C. This helps the snow to slide-off easily.

D. This allows branches to carry loads of snow.

50. Study the given flow chart to identify food components 'X', 'Y' and 'Z'. Read the following statements regarding 'X', 'Y', and 'Z' and select the correct ones.



(i) Cellulose is a 'X' which is not a food for humans because it can not be digested or absorbed in the body.

(ii) 'Z' are the richest source of energy to our body but they require more oxygen for their combustion and hence are more expensive than 'Y'.

(iii) When we consume more Z than required, our body stores the excess of Z as Y.

(iv) X act as insulators and keep our body warm.

(v) X is essential for maintenance of the body tissues.

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

B. (iii), (iv) and (v)

C. (ii) and (v)

D. (i) and (iv)

SPACE FOR ROUGH WORK

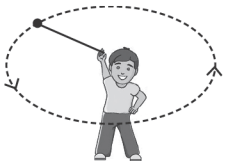
SCIENCE OLYMPIAD FOUNDATION

18th NSO

LEVEL - 2

Year 2015-16

1. Avin tied a small stone to one end of a string that he had. Then he held the other end of the string and started whirling it, initially slowly, then faster and faster. Which of the following statements is incorrect?



A. The stone always undergoes circular motion.
B. The distance of the stone from Avin's hand keeps changing.
C. The stone undergoes non-periodic motion.
D. Both B and C.

---

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

	Column I		Column II
P.	150 dm	1.	1.5 m
Q.	150 mm	2.	150 m
R.	0.15 km	3.	15 m
S.	150 cm	4.	0.15 m

A. P - 3, Q - 4, R - 1, S - 2
B. P - 4, Q - 3, R - 2, S - 1
C. P - 3, Q - 4, R - 2, S - 1
D. P - 4, Q - 3, R - 1, S - 2

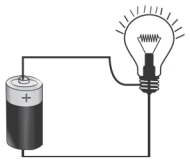
---

3. Manu has three identical roses but of different colours; red, yellow and white. She shines a torch on the three roses in turn and gets a shadow on the wall in each case. Deepak who is observing the shadows formed on the wall can

A. Distinguish shadow of red rose only.
B. Distinguish shadows of red and yellow roses only.
C. Distinguish shadows of all the three roses.
D. Never distinguish the shadows of three roses.

---

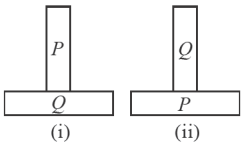
4. The given figure shows a light bulb connected to a cell. Which of the following shows the energy changes that take place when a bulb glows?



A. Chemical energy → electrical energy → heat energy → light energy
B. Chemical energy → electrical energy → light energy → heat energy
C. Electrical energy → chemical energy → light energy → heat energy
D. Electrical energy → chemical energy → heat energy → light energy

---

5. Two identical metal bars *P* and *Q* are positioned as shown in the two diagrams. If there is a strong attraction in figure (i) and weak attraction in figure (ii), what are the possible materials for *P* and *Q*?



	Bar *P*	Bar *Q*
A.	Steel bar	Steel bar
B.	Steel bar	Bar magnet
C.	Bar magnet	Steel bar
D.	Bar magnet	Bar magnet

---

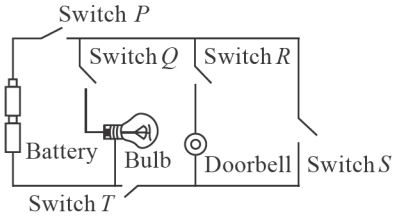
6. Which of the following statements are correct?

(i) Wheels of a car moving at a constant speed undergo linear, rotational as well as periodic motion.
(ii) A hockey player running after the ball during a match undergoes linear and periodic motion.
(iii) The pendulum of a clock undergoes periodic and oscillatory motion.

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

---

7. In the given figure, which of the following switches need to be closed to change electrical energy to sound energy only?



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

---

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

Statement 1 : Rubber and plastic are used for covering electrical wires, plug tops and switches.

Statement 2 : Rubber and plastic are insulators.

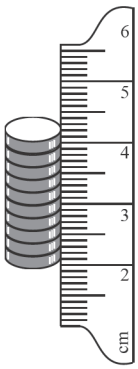
A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Both statements 1 and 2 are false.

---

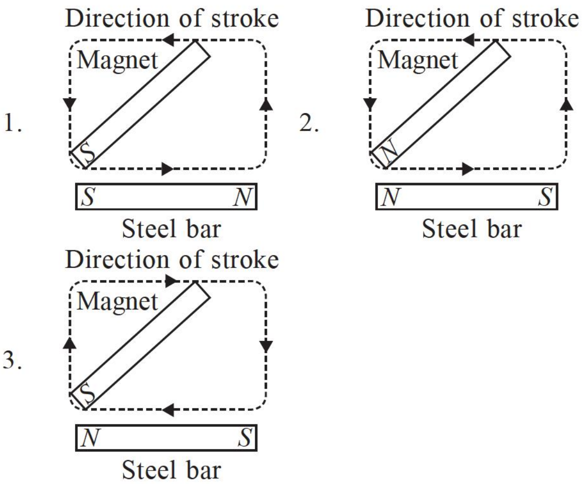
9. Salman has ten 1 rupee coins. He makes a stack of those ten coins and measures the length of the stack using a scale as shown in the figure.

What is the thickness of one coin?

A. 1.1 mm
B. 1.5 mm
C. 2.1 mm
D. 2.5 mm

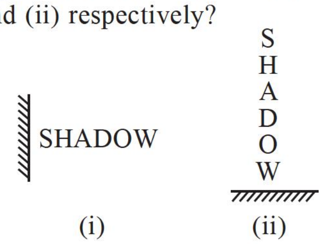


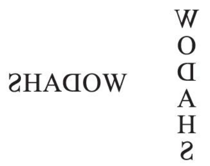
10. Which of the following are possible results when a steel bar is being magnetised by the stroking method?



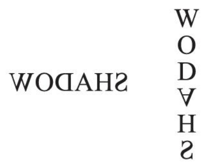
A. 1 and 2 only B. 1 and 3 only
C. 2 and 3 only D. 1, 2 and 3

11. Which of the following options shows the correct mirror image of the word 'SHADOW' in the given cases (i) and (ii) respectively?



A. 

B. 

C. 

D. 

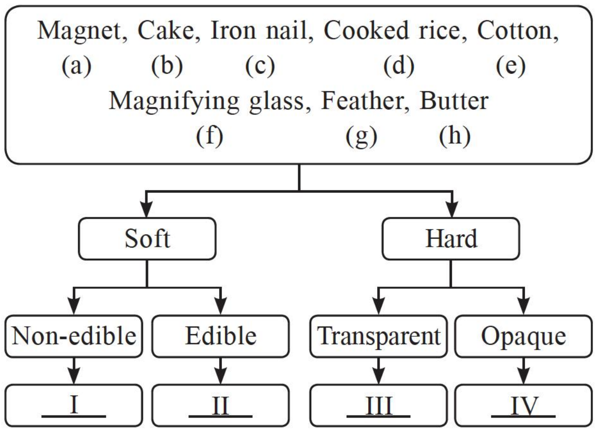
12. The shadow below a tree has bright spots in it because ________.

A. Leaves attract light
B. The light bends around the leaves to form circular spots
C. The gaps between the leaves act as pin holes
D. Leaves reflect light

13. Which of the following observations confirms that an object is a magnet?

A. The object is attracted by a strong bar magnet.
B. The object causes a compass needle to move.
C. The object rotates before being attracted to a bar magnet.
D. The object is attracted to both poles of a horseshoe magnet.

14. Ritika, a science teacher prepared the following flowchart and asked the students to fill in the blanks.



Mark the correct option.

	I	II	III	IV
A.	a, g	b, d, h	f	c, e
B.	a, c	d, g	e, h	b, f
C.	e, g	b, d, h	f	a, c
D.	e	b, c, d	f, h	a, g

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

	Column I		Column II
(p)	Potato wafers mixed with wheat flour	(i)	Sieving
(q)	Coconut oil in water	(ii)	Threshing
(r)	Grain seeds from their stalks	(iii)	Winnowing
(s)	Husk from grain seeds	(iv)	Separating funnel
(t)	Chickpeas mixed with gram flour	(v)	Handpicking

A. (p) - (v), (q) - (iv), (r) - (iii), (s) - (ii), (t) - (i)
B. (p) - (i), (q) - (iv), (r) - (iii), (s) - (ii), (t) - (v)
C. (p) - (iii), (q) - (i), (r) - (v), (s) - (iv), (t) - (ii)
D. (p) - (v), (q) - (iv), (r) - (ii), (s) - (iii), (t) - (i)

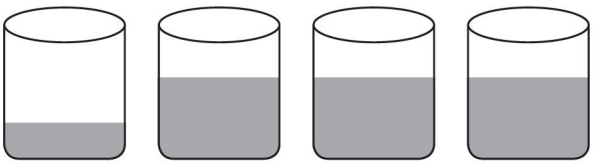
16. Ram, a class 6 student observed different types of changes and tabulated them in the given table.

S. No.	Change	Physical change	Can be reversed?
1.	Folding of paper to make a boat	✓	✓
2.	Making biogas from cow dung	×	✓
3.	Dissolving sugar into water	✓	×
4.	Melting of chocolate	✓	✓
5.	Milk to curd	×	×

Which of the given observations are incorrect?

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

17. One gram of salt is added to each of the following beakers containing water at different temperature conditions.



Which of the following represents the decreasing order of the time taken by the salt to dissolve completely?

A. $P < S < Q < R$
B. $R < Q < P < S$
C. $P > S > Q > R$
D. $Q > R > P > S$

18. Four substances P, Q, R and S are mixed in a beaker containing water. The properties of these substances are listed in the given table.

Substance	Colour	Taste	Soluble in water	Magnetic in nature
P	White	Salty	Yes	No
Q	Brown	Non-edible	No	No
R	White	Sweet	Yes	No
S	Grey	Non-edible	No	Yes

Which of the following methods of separation should be used in sequence to obtain substance S from the mixture?

A. Filtration, evaporation followed by magnetic separation.
B. Separating funnel followed by churning.
C. Filtration followed by magnetic separation.
D. Sedimentation and decantation followed by evaporation.

19. Mansi listed the four groups of different objects in the given table.

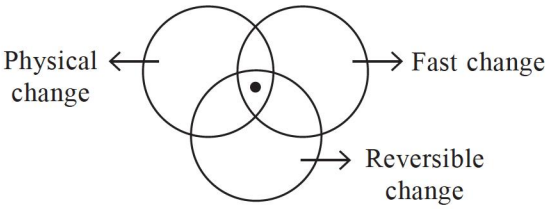
Group	Objects
1	Aluminium foil, Gold ring
2	Wood, Cardboard
3	Books, Newspaper
4	Honey, Sugar

The correct property according to which these substances are categorised into different groups is in

I. Group 1 : Lustrous metals
II. Group 2 : Softness
III. Group 3 : Made up of paper
IV. Group 4 : Edible and insoluble in water

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

20. Study the given Venn diagram.



Centre point (•) represents

1. Rusting of a bicycle
2. Breaking of glass vase
3. Blowing of a balloon
4. Hot milk to cold milk

A. 1, 2 and 4 only
B. 3 and 4 only
C. 2, 3 and 4 only
D. All of these.

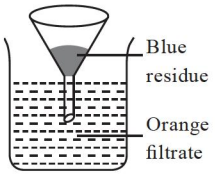
21. Find the incorrect match.

A. Butter paper–translucent
B. Air–transparent
C. Steel glass–opaque
D. Wooden door–transparent

22. The properties of four different solids are listed in the given table.

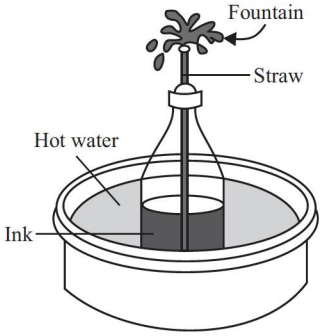
Solid	Colour	In water
P	Orange	Insoluble
Q	Orange	Soluble
R	Blue	Insoluble
S	Blue	Soluble

A mixture containing two of the given solids is added to excess water, stirred and filtered as shown in the given figure. The mixture contains



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

23. A bottle containing ink and a straw is sealed properly and placed in a pan of very hot water. After some time, a fountain is seen as shown in the given figure :



This is due to

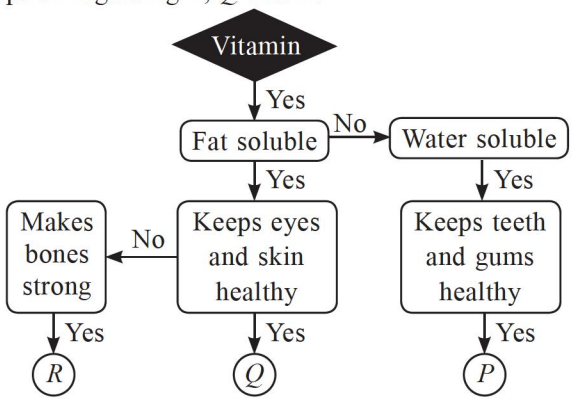
A. contraction of liquid on cooling
B. expansion of liquid on cooling
C. expansion of liquid on heating
D. contraction of liquid on heating.

24. Which of the following statements is incorrect?
A. Milk, vinegar and lemon juice are miscible in water while oil and paint are immiscible in water.
B. Steel and copper are good conductors of heat whereas wood and rubber are bad conductors of heat.
C. Allpin floats while cork sinks in water.
D. None of these.

25. Which of the following are non-periodic changes?
I. Sunrise and sunset
II. Growth of plants
III. Occurrence of a rainbow
IV. Beating of heart
A. II and III only B. II and IV only
C. I and IV only D. All of these.

26. Given below are three statements (a-c) each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
(a) Scurvy is a deficiency disease caused by the lack of __(i)__ in diet.
(b) __(i)__ is required for normal growth of bones. Our body can make it when the skin is exposed to __(ii)__.
(c) Blood contains __(i)__, deficiency of which causes a disease called __(ii)__, in which a person looks pale and gets tired easily.
A. (a) - (i) Vitamin A
(b) - (i) Vitamin C, (ii) Heat
B. (b) - (i) Vitamin B, (ii) Sunlight
(c) - (i) Iron, (ii) Rickets
C. (a) - (i) Vitamin D
(c) - (i) Iron, (ii) Anaemia
D. (a) - (i) Vitamin C
(b) - (i) Vitamin D, (ii) Sunlight

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



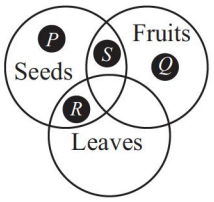
A. *Q* refers to vitamin B-complex.
B. Our body can synthesise *R* and *P* hence we need not to include them in our diet.
C. *P* is obtained from citrus fruits like lemon, orange etc.
D. Deficiency of *P* leads to rickets whereas deficiency of *R* leads to beri-beri.

28. Which of the following statements is correct?
A. Scales in frogs help them to move easily through water.
B. The eyes on the sides of the head of a lion allow it to have a correct idea about the location of its prey.
C. Leaves of submerged aquatic plants are usually narrow and do not possess stomata.
D. In desert plants, roots are poorly developed and are of secondary importance.

29. Which of the following statements is correct with respect to the movement in the animal shown in the given figure?

A. The slippery movement of foot caused due to contraction of its muscles helps the animal in its loco-motion.
B. It moves fast in a zig zag manner.
C. It moves with the help of a series of muscular rings present all along its body.
D. The forelimbs help to push its body forward while the hind limbs help to push its body backward.

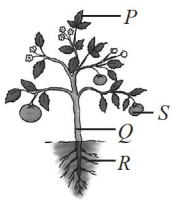
30. The given Venn diagram represents some plants (*P*, *Q*, *R* and *S*) based on their edible parts. Select the incorrect option regarding this.



A. *P*-Cumin, *R*-Fenugreek
B. *P*-Rice, *Q*-Apple
C. *R*-Coriander, *Q*-Tomato
D. *Q*-Sugarcane, *S*-Cabbage

31. Collecting rainwater and storing it for later use is called rainwater harvesting. Which of the following statements are not true for the technique of rooftop rainwater harvesting?
(i) Rainwater is allowed to go down the roadside drains.
(ii) Rainwater from roof top is collected in storage tanks.
(iii) The collected rainwater needs to be filtered as it contains soil.
(iv) This practice reduces the amount of ground water available to us.
A. (i) and (ii) only B. (ii) and (iii) only
C. (iii) and (iv) only D. (i) and (iv) only

32. Refer to the given figure with its parts labelled as *P*, *Q*, *R* and *S*. Which of the following statements are correct regarding this?



(i) Plants like carrot, radish and turnip store their food in *R*.
(ii) *Q* and *P* are modified into tendrils in plants like grapevine and *Gloriosa* respectively, to help them give support.
(iii) In cactus and aloe vera *P* is reduced to spines and *Q* stores water and mucilage.

(iv) In onion and beetroot, S and Q are modified respectively to store food.
(v) In ginger and potato, Q is underground and modified to store food.

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

33. Refer to the given dichotomous key.

I. (a) It is a natural fibre. - Go to II
(b) It is a synthetic fibre. - $\boxed{P}$

II. (a) It is obtained from plants. - Go to III
(b) It is obtained from animals. - Go to IV

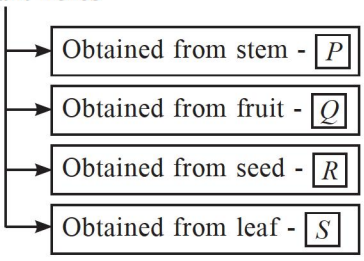
III. (a) It is obtained from seeds of plants. - $\boxed{Q}$
(b) It is obtained from stems of plants. - $\boxed{R}$

IV. (a) It is obtained from hair of some animals. - $\boxed{S}$
(b) It is obtained from non-feeding stage of an insect. - $\boxed{T}$

Select the incorrect option regarding P, Q, R, S and T.

A. Clothes made purely of P do not wrinkle easily and also cannot absorb sweat.
B. Q can be best suited for summer clothing as it absorbs sweat and breathes well.
C. R can be obtained by retting of jute stems and is used for making carpets, ropes, etc.
D. T was first developed in Africa whereas India is the leading producer of S.

34. Study the given classification chart of plant fibres.



Which of the following holds true for P, Q, R and S?

A. P could be flax or jute.
B. P and Q are biodegradable whereas R and S are non-biodegradable.
C. Q could be coir whereas S could be sisal.
D. Both A and C

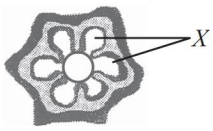
35. Read the given statements and select the correct option.

Statement I : Jute is used to make containers for young saplings that can be planted directly.

Statement II : Jute cannot be easily decomposed by microorganisms.

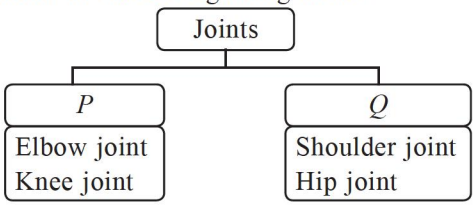
A. Both statements I and II are true and statement II is the correct explanation of statement I.
B. Both statements I and II are true but statement II is not the correct explanation of statement I.
C. Statement I is true but statement II is false.
D. Both statements I and II are false.

36. The given figure is the cross-section of a lady's finger fruit. Identify (i) the parts labelled 'X' and (ii) the parts of the flower from where they have been developed.



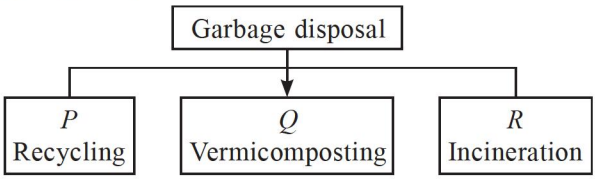
	(i)	(ii)
A.	Pollen grains	Anthers
B.	Seeds	Ovules
C.	Ovules	Ovary
D.	Seeds	Stigma

37. Study the given classification chart showing two types of skeletal joints (P and Q). Which of the following statements is correct regarding these?



A. Joint P is also present between vertebrae.
B. Joint Q is also present between bones of fingers.
C. Joint P allows movement in all directions whereas joint Q allows sideways movements only.
D. In joint Q, round end of one bone fits into hollow part (socket) of another bone.

38. Study the given flow chart that shows some ways of garbage disposal.



Which is the best way to dispose the types of wastes listed below?

a. Vegetable peels b. Tea leaves
c. Animal excreta
d. Used needles and syringes
e. Newspapers f. Polybags
g. Cold-drink cans

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

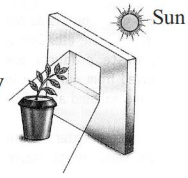
39. Read the given statements each with one or two blanks. Select the option that correctly fills any three of these blanks.

(a) Pea and tulsi have __(i)__ root systems whereas maize and barley have __(ii)__ root systems.
(b) __(iii)__ roots are pillar like supportive roots that grow downwards from branches of trees and fix themselves in soil.
(c) __(iv)__ venation is found in rose whereas __(v)__ venation is found in wheat.

(d) __(vi)__ is modified in cactus to perform photosynthesis whereas it is modified in ginger to __(vii)__.

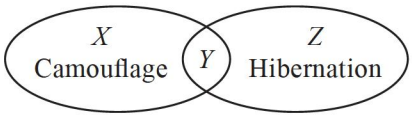
A. (i) - Tap, (iii) - Prop, (vii) - Store food
B. (ii) - Fibrous, (iv) - Parallel, (vi) - Root
C. (i) - Fibrous, (iv) - Parallel, (v) - Reticulate
D. (ii) - Tap, (iii) - Stilt, (vi) - Stem

40. Which of the following cannot be interpreted from the given figure?



A. Some plant parts have a tendency to bend towards light.
B. Plants show response to environmental stimuli.
C. Roots of the plants have a tendency to move away from light.
D. Plants possess the characteristics of living organism.

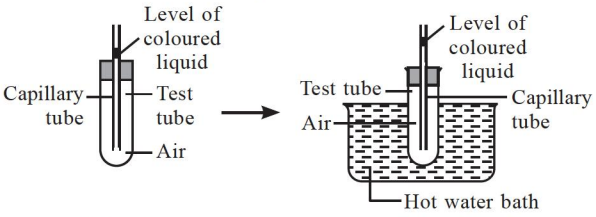
41. Study the given Venn diagram that classifies three animals based on their features.



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

A. *X* could be a predator like tiger or a prey like stick insect.
B. *Y* could be a polar bear.
C. *Z* could be a lizard.
D. Organism *Z* is always cold blooded.

42. Rohan conducted an experiment as shown here.



What could be the reason for the rise in the level of coloured liquid in the capillary within the test tube in step II?

A. When test tube was placed in hot water bath, air present within the test tube expanded due to heat.
B. When test tube was placed in hot water bath, air present within the test tube contracted due to heat.
C. Water in the bath contracted due to placement of air-filled test tube in it.
D. None of these

43. '*X*' is a gas which is required by producers to prepare their food. Select the incorrect statement regarding '*X*'.

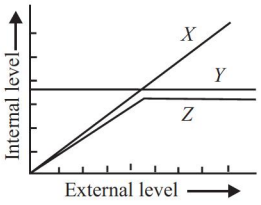
A. It constitutes 0.03% of air in atmosphere.
B. It turns lime water milky.
C. It is an important component of fertilisers.
D. It extinguishes fire.

44. Organism *X* has liquid skeleton. Organism *Y* has a calcareous exoskeleton and organism *Z* has endoskeleton made up of bones.

Which of the following holds true for *X*, *Y* and *Z*?

A. *X* could be a snake or an earthworm.
B. *Y* could be a snail or an oyster.
C. *Z* could be a bird or a starfish.
D. *Y* could be a cockroach or a frog.

45. The given graph represents how three different living organisms (*X*, *Y* and *Z*) cope with the external environmental conditions.

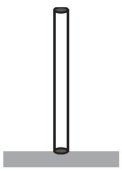


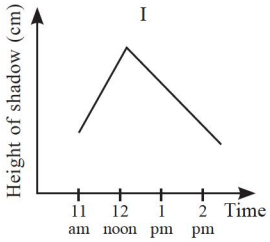
Study the graph and select the correct option regarding *X*, *Y* and *Z*.

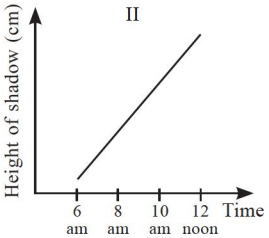
A. *X* could be a mammal.
B. *Y* could be a bird.
C. *Z* could be a mammal.
D. *X* could be a bird.

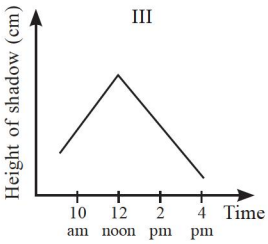
ACHIEVERS SECTION

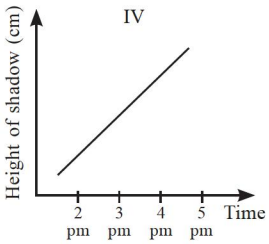
46. The given figure shows a pole fixed in the centre of a garden. Four students observed the shadow formed by the pole for different time intervals and then plotted the graph of height of shadow (in cm) vs their observation time, as shown here.











Which of the following graphs show(s) correct observations?

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

47. Amit, Rahul and Naveen were given three glass slides I, II and III respectively and a white paper with a cross mark (×). Amit painted his glass slide with a light blue colour. Rahul painted his glass slide with a black paint and Naveen left his slide as it is. They put each of these slides over the mark.

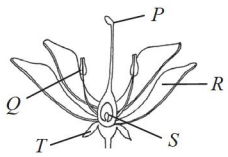
I II III

Fill in the blanks by choosing an appropriate option.

Slide I is _(p)_, slide II is _(q)_ and slide III is _(r)_.

	(*p*)	(*q*)	(*r*)
A.	transparent	translucent	opaque
B.	translucent	transparent	opaque
C.	translucent	opaque	transparent
D.	opaque	translucent	transparent

48. Refer to the given figure and select the incorrect statement regarding its labelled parts.



A. If 'T' is removed at bud stage of flower, chances of damage to floral organs is increased.
B. Pollination involves the transfer of pollen grains from 'Q' to 'P'.
C. Function of 'S' is to receive the pollen grains during pollination.
D. 'R' is usually brightly coloured and helps in pollination.

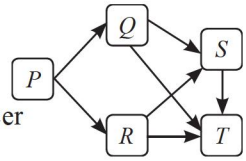
49. Read the given paragraph where few words have been italicised.

Rain is our main source of water. Water vapours present in the air *precipitate* to form clouds. When rain falls, some of it *condenses* back to atmosphere and some passes through the soil upto the level of non-porous rocks beneath to form *groundwater*. Groundwater may come out at some places to form *water table*.

Select the incorrect option regarding this.

A. *Precipitate* should be replaced with *condense*.
B. *Condenses* should be replaced with *evaporates*.
C. *Groundwater* should be replaced with *run-off*.
D. *Water table* should be replaced with *spring*.

50. Study the given food web and select the correct option regarding *P*, *Q*, *R*, *S* and *T*.



A. *Q* is acting as both producer and consumer.
B. There are four food chains in the given food web.
C. More energy is passed from organism *S* to organism *T* than from organism *R* to organism *T*.
D. *Q* and *T* compete with each other for food as they have common preys.

SPACE FOR ROUGH WORK

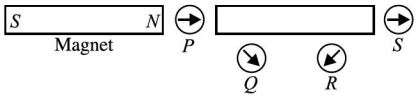
SCIENCE OLYMPIAD FOUNDATION

19th NSO

LEVEL - 2

Year 2016-17

1. The given figure shows a zinc bar placed near a strong magnet. Four compasses *P*, *Q*, *R* and *S* are arranged near by the magnet and the zinc bar as shown. Which one of the compasses does point to the wrong direction?

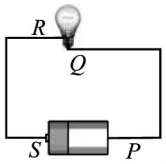


A. *P* B. *Q*
C. *R* D. *S*

2. Which of the following statements are true?
(i) A shadow is formed on the same side of the object as the source of light.
(ii) The image formed by a pinhole camera is always erect.
(iii) We see stars because they reflect light from the sun.
(iv) The shadow of a pole is longest in the evening and shortest at the noon.
(v) Mirrors are good reflectors of light.

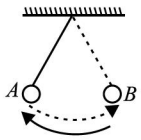
A. (i), (ii) and (iii) only
B. (i), (ii) and (iv) only
C. (iv) and (v) only
D. (i), (ii), (iii) and (v) only

3. The given circuit shows an electric cell connected to a bulb through conducting wires. Identify the direction of current flow in the circuit.



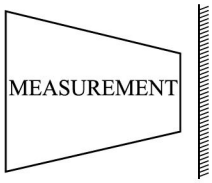
A. *PQRS*
B. *SRQP*
C. *PQSR*
D. *QPRS*

4. A pendulum takes 0.8 seconds to swing from the extreme points *A* to *B*. What will be the time taken for the pendulum to make 15 oscillations ?



A. 12 seconds
B. 24 seconds
C. 36 seconds
D. 48 seconds

5. A card with the word MEASUREMENT written on it, is placed in front of a plane mirror as shown in the figure. The image of the word MEASUREMENT seen in the mirror is

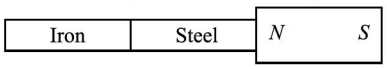


A. TNEMEERUSAEM B. MEASUREMENT
C. MEASUREMENT D. TNEMEERUSAEM

6. Read the given statements and select the correct option.
Statement 1 : The displacement of a body may be zero, though distance can be finite.
Statement 2 : If a body moves such that finally it arrives at initial point, then displacement is zero while distance is finite.

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. Statement 1 is false and statement 2 is true.

7. A light steel bar and a light iron bar are attracted to a magnet for a long time as shown in the figure. What will possibly happen when the magnet is removed?



A. The steel and iron bars repel each other.
B. Both steel and iron bars lose their magnetism.
C. Steel bar retains its magnetism and iron bar loses its magnetism.
D. Iron bar retains its magnetism and steel bar loses its magnetism.

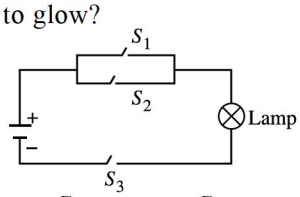
8. Match the column I with column II and select the correct option.

	Column I		**Column II**
(i)	Bicycle moving on a straight road	(a)	Rotational motion
(ii)	Pendulum of a clock	(b)	Circular motion
(iii)	Motion of the earth	(c)	Periodic motion
(iv)	Apple falling from a tree	(d)	Curvilinear motion
(v)	Car moving on a curved road	(e)	Rectilinear motion

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

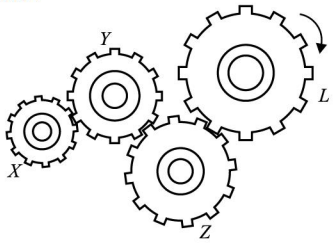
9. A bar magnet is dipped in iron filings and taken out. Which of the following observations is correct?
A. The maximum quantity of filings gets sticked to the ends of the magnet.
B. The maximum quantity of filings gets sticked to the middle.
C. The filings gets uniformly distributed.
D. The maximum quantity will be sticked at the north pole only.

10. In the given circuit diagram, S_1, S_2 and S_3 are switches. Which of the following switch combinations is correct for the lamp to glow?



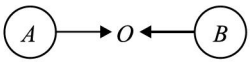
	S_1	S_2	S_3
A.	Opened	Opened	Closed
B.	Closed	Closed	Opened
C.	Opened	Closed	Opened
D.	Closed	Opened	Closed

11. The given diagram shows four gears. Dev applied a force to make the largest gear L, rotates in a clockwise direction as shown. In which direction will gears X, Y and Z rotate?



	X	Y	Z
A.	Anti-clockwise	Anti-clockwise	Clockwise
B.	Anti-clockwise	Clockwise	Anti-clockwise
C.	Clockwise	Anti-clockwise	Clockwise
D.	Clockwise	Anti-clockwise	Anti-clockwise

12. Two identical metal balls A and B moving in opposite directions with different speeds hit each other at point O as shown in the figure. Changes are most likely to appear in their



A. Shapes and speeds
B. Speeds and directions
C. Directions and volumes
D. Volumes and shapes.

13. In ancient times, people used different units of measurement of length and distance. Some of them are

P. Cubit *Q.* Footstep
R. Handspan *S.* Arm length

The correct arrangement in terms of their increasing length is

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

14. During the science activity, Ms. Rakhee conducted the following experiments :

Experiment I : 10 g of rock crystals of common salt were dissolved in 50 mL of water at 30°C.
Experiment II : 30 g of finely powdered common salt was dissolved in 50 mL of water at 60°C.
Experiment III : 10 g of rock crystals of common salt were dissolved in 100 mL of water at 30°C.
Experiment IV : 10 g of finely powdered common salt was dissolved in 100 mL of water at 60°C.
In which experiment common salt took the shortest time to dissolve?

A. Experiment I B. Experiment II
C. Experiment III D. Experiment IV

15. Identify W, X, Y and Z.

W : An edible liquid miscible in water
X : A non-edible, inflammable liquid that floats on water
Y : An edible, coloured liquid that does not flow easily
Z : A colourless, non-inflammable liquid

	W	X	Y	Z
A.	Lemonade	Coconut oil	Milk	Petrol
B.	Vinegar	Kerosene	Honey	Water
C.	Coconut oil	Kerosene	Honey	Milk
D.	Sunflower oil	Mustard oil	Milk	Kerosene

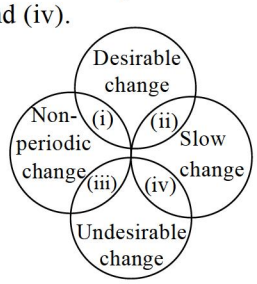
16. Shubhi classified some changes around us as shown in the table :

S. No.	Change	Type of change
1.	Weathering of rocks	Physical, reversible
2.	Germination of seeds	Physical, irreversible
3.	Stretching of rubber band	Physical, reversible
4.	Dissolving salt in water	Chemical, reversible
5.	Cooking of rice	Chemical, irreversible
6.	Rotation of a fan	Physical, irreversible

Which of these changes are correctly classified?

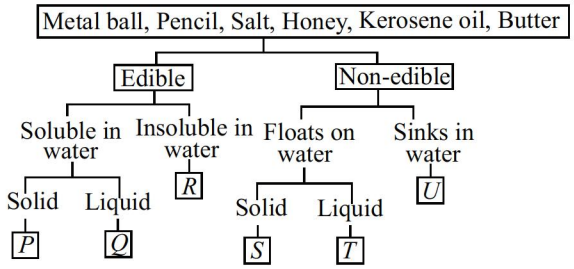
A. 1 and 3 only B. 3 and 5 only
C. 4 and 5 only D. None of these

17. Study the given Venn diagram carefully and identify (i), (ii), (iii) and (iv).



	(i)	(ii)	(iii)	(iv)
A.	Curdling of milk	Ripening of fruits	High and low tides	Bursting of crackers
B.	Melting of ice	Cutting of trees	Inflation of tyres	Bursting of balloon
C.	Preservation of food items	Change of seasons	Eruption of volcanoes	Rusting of iron
D.	Rising and setting of Sun	Burning of cooking gas	Earthquake	Burning of paper

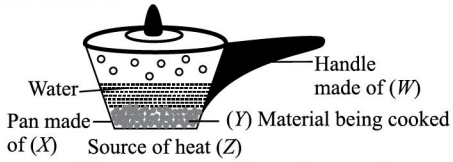
18. The given flowchart was prepared by Neelima for sorting materials into different groups. She handed over the chart to her teacher with few blanks. Fill in the blanks by choosing an appropriate option.



	P	Q	R	S	T	U
A.	Butter	Honey	Salt	Metal ball	Kerosene oil	Pencil
B.	Salt	Honey	Butter	Pencil	Kerosene oil	Metal ball
C.	Salt	Butter	Honey	Metal ball	Pencil	Kerosene oil
D.	Pencil	Honey	Butter	Salt	Kerosene oil	Pencil

19. Which of the following statements is/are incorrect?
I. Decantation can separate a liquid from an insoluble solid after sedimentation.
II. A mixture of milk and water can be separated by using separating funnel.
III. In hot water there is no limit to the amount of sugar that will dissolve in it.
IV. When detergent is added to oil-water mixture, it can be separated easily.
A. I only B. II and IV only
C. I and III only D. II, III and IV only

20. Ria was observing her mother cooking dinner in the kitchen. She tried to identify materials being used and their nature.



The given table represents her observations.

S. No.	Material	Identification	Property
I.	*W*	Plastic	Good conductor of heat
II.	*X*	Aluminium	Good conductor of heat
III.	*Y*	Rice	Edible
IV.	*Z*	CNG	Inflammable

Which of her conclusions are incorrect?
A. I, III and IV only B. II and IV only
C. I and IV only D. None of these

21. Ms. Shobhna conducted a science activity in following steps :
I : She made crystals of pure copper sulphate from an impure sample.
II : She dissolved the crystals in pure water to make a blue solution.
III : She added a metallic piece into the copper sulphate solution and after some time colour of the solution changed to green.
Which of the following statements is correct regarding this activity?
A. Step I involves a physical change while steps II and III involve chemical changes.
B. Steps I and II involve physical changes while step III involves chemical change.
C. All the steps involve physical changes.
D. All the steps involve chemical changes.

22. Change *X* : Cooling a mixture of air and kerosene vapours so that liquid kerosene condenses out.
Change *Y* : Burning a mixture of air and kerosene vapours.
What type of changes *X* and *Y* are?
A. *X* – Chemical change, *Y* – Reversible change
B. *X* – Physical change, *Y* – Chemical change
C. *X* – Chemical change, *Y* – Physical change
D. *X* – Reversible change, *Y* – Physical change

23. Match column I showing the properties of components of a mixture with column II showing methods of separation and select the correct answer from the given codes.

	Column I		Column II
P.	Difference in size of solid particles	(i)	Evaporation
Q.	Difference in boiling points of miscible liquids	(ii)	Loading
R.	Very fine particles insoluble in water	(iii)	Distillation
S.	Very fine particles soluble in water	(iv)	Sieving

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

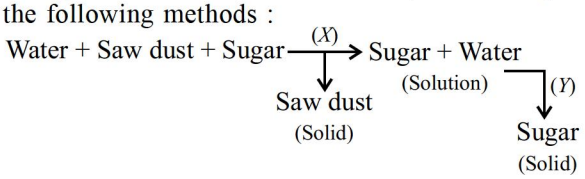
24. Shobhit a class 6 student, took some samples and struck each with a hammer. He noted down his observations in the given table.

S. No.	Sample	On hammering	Result
1.	Sponge	No change	(i)
2.	Gold bangle	Gets flattened	(ii)
3.	Stone	Breaks into pieces	(iii)

Identify (i), (ii) and (iii).

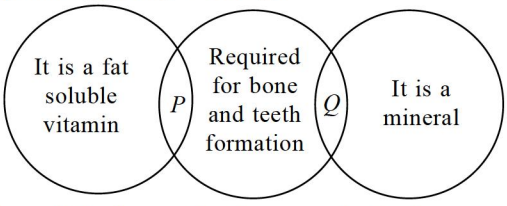
	(i)	(ii)	(iii)
A.	Brittle	Malleable	Soft
B.	Soft	Ductile	Brittle
C.	Soft	Malleable	Brittle
D.	Brittle	Ductile	Soft

25. To separate constituents of a mixture, Varsha adopted the following methods :



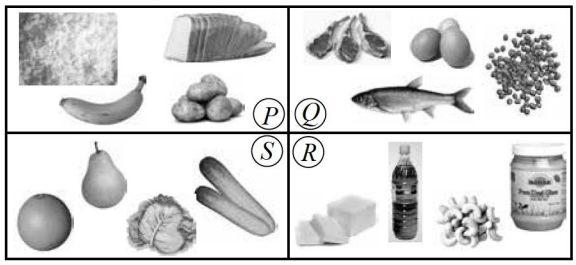
What could be the methods (*X*) and (*Y*)?
A. (*X*) → Loading ; (*Y*) → Condensation
B. (*X*) → Filtration ; (*Y*) → Evaporation
C. (*X*) → Sedimentation ; (*Y*) → Decantation
D. (*X*) → Distillation ; (*Y*) → Centrifugation

26. Refer to the given Venn diagram and select the incorrect option regarding *P* and *Q*.



A. *P* is formed when our body is exposed to sunlight.
B. Deficiency of *P* or *Q* can cause rickets.
C. *Q* is present in milk and its products.
D. *P* is vitamin D whereas *Q* could be calcium or sodium.

27. Refer to the given pie chart showing nutrients *P*, *Q*, *R* and *S* present in different foods and identify the correct statements regarding them.



(i) Food rich in *P* is taken by sportspersons which provides them with instant energy and it turns blue-black in colour on adding iodine solution.
(ii) *S* helps in retaining water in the body and maintains healthy bowel movement.
(iii) *S* is important for growth and repair of body tissues thus, required in more amount in person recovering from accident injuries.
(iv) *R* forms antibodies in the body and its deficiency causes marasmus characterised by dry and rough hair, swollen stomach and mental retardation in children.
(v) Food sample containing *Q* turns into purple or violet colour when treated with 2 drops of copper sulphate and sodium hydroxide solution.

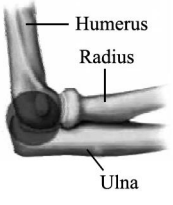
A. (i), (iii) and (iv) only
B. (ii), (iii), (iv) and (v) only
C. (i), (ii) and (v) only
D. (ii), (iii) and (iv) only

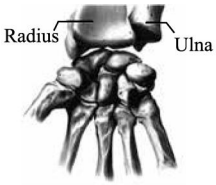
28. Match column I with column II and select the correct option from the given codes.

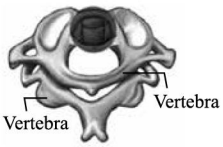
	Column I		**Column II**
1.	Weft	p.	Tying knots in yarn to make carpets, etc.
2.	Felt	q.	Longitudinal threads running across the fabric
3.	Knotting	r.	Filling threads running horizontally across the length of fabric
4.	Warp	s.	Fabric made by pressing fibres together

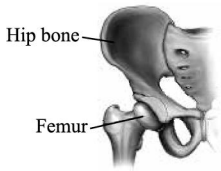
A. 1 → r, 2 → s, 3 → p, 4 → q
B. 1 → q, 2 → r, 3 → s, 4 → p
C. 1 → p, 2 → q, 3 → r, 4 → s
D. 1 → s, 2 → q, 3 → p, 4 → r

29. Which of the following joints shows the given characteristics?
(i) It allows movement in one plane only.
(ii) It allows back and forth or up and down movement.

A. 

B. 

C. 

D. 

30. Read the given statements and select the option stating which ones are true (T) and which ones are false (F).
(i) In cactus, leaves are reduced to spines and stems perform photosynthesis.
(ii) Mountain goats have cloven hooves for climbing rocky slopes of mountains.
(iii) In lion, eyes are placed in front of his head to look in all directions.
(iv) Deer have long ears to hear sound of slight movements of their predators.
(v) Frogs have strong foreleg muscles which help them leap around to catch their prey.
(vi) Submerged plants have thin, ribbon like leaves to withstand water currents of flowing water.

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

31. Ridhan classified animals in four groups on the basis of their feeding habits. In doing so, he wrongly placed one animal in one of the groups. Identify this group and select the correct option.
A. Giraffe, rabbit, wildebeest and deer
B. Crocodile, crow, snake and eagle
C. Leech, mosquito, lice and bed bug
D. Tiger, snow leopard, wolf and lion

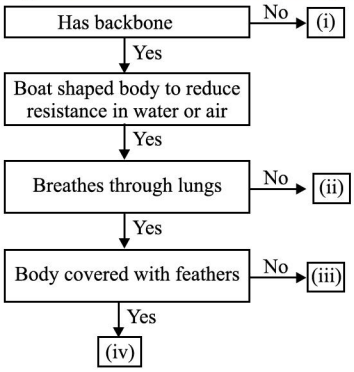
32. Read the given passage and select the option which correctly fills any three of the blanks.
__(i)__ is the main source of water on Earth however __(ii)__, is considered more pure than (i) as it is free from contaminants. City roads flooded with water, dry up due to the process of __(iii)__. Rate of (iii) increases with __(iv)__ in temperature. The process of __(v)__ changes water vapour present in air into water. (iii) and (v) help in circulating water between hydrosphere and atmosphere.
A. (i)-Groundwater, (ii)-Rainwater, (iv)-Decrease
B. (ii)-Underground water, (iii)-Evaporation, (v)-Transpiration
C. (i)-Surfacewater, (ii)-Groundwater, (iv)-Decrease
D. (ii)-Groundwater, (iv)-Increase, (v)-Condensation

33. Which among the following statements is incorrect?
A. Cigarette paper is commonly made from flax fibre.
B. Silk is obtained from larva of silkworm, fed on leaves of mulberry trees.
C. Cotton grows well in black soil rich in humus.
D. Coir is obtained from husk, which is separated from coconut by soaking them in water.

34. Read the given statements and select the correct option.
Statement 1 : Animals cannot take nitrogen directly from atmosphere rather they obtain it from plants they eat.
Statement 2 : Plants also cannot take nitrogen directly from atmosphere, rather free living or symbiotic nitrogen fixing bacteria present in soil convert atmospheric nitrogen into soluble nitrogen compounds that can be used by plants.
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. Read the following passage carefully.
P is found abundantly in cod liver oil and is important for visual efficiency. *Q* is sourced from amla, tomato and citrus fruits and its deficiency may cause wounds to take longer time for healing. *R* is formed in our body in presence of sunlight and its deficiency in toddlers may cause deformity of legs.
Now select the incorrect option regarding this.
A. *P* can be found in spinach but not *R*.
B. In absence of *R* our body will show calcium deficiency even if it is abundant in our food.
C. *Q* is also called B-complex as many of its varieties are available.
D. *P* cannot be dissolved in water.

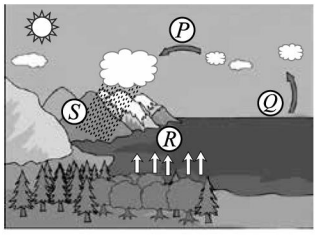
36. Refer to the given flow chart and identify (i) – (iv)



	(i)	(ii)	(iii)	(iv)
A.	Cockroach	Snake	Penguin	Frog
B.	Earthworm	*Scoliodon*	Dolphin	Sparrow
C.	Leech	Crocodile	Starfish	Whale
D.	Snail	Silverfish	Shark	Ostrich

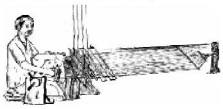
37. Class teacher gave four different samples of fibres to four students. Ria has fibre *H*, which is obtained from plant that grows best in alluvial soil in warm and humid climates. Fibre *I* given to Sumit gives smell of burning hair on being burnt and has ability to trap air and heat, while fibre *J* given to Kanika, is a fibre obtained from an insect. Fibre *K* given to Rahul burns with smell of burning plastic. Identify the fibres *H*, *I*, *J* and *K* and select the correct option regarding them.
A. Fibre *H* is the cheapest vegetable fibre and is also known as golden fibre.
B. Fibre *I* is obtained from passion vine and can be worn both in summers and winters.
C. Fibre *J* does not absorb water at all hence is used in making raincoats.
D. Fabric made of fibre *K* can absorb sweat, thus is comfortable to wear in hot and humid weather.

38. Which statement is incorrect regarding the given figure?
A. Process *Q* helps to obtain salt from sea water.
B. The mirror in the bathroom becomes foggy when we take hot shower due to process *P*.



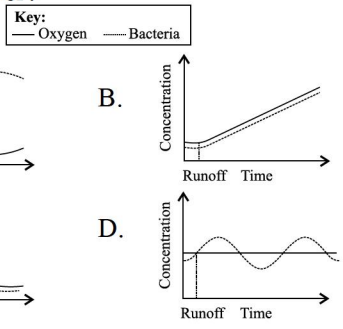
C. Process *S* results in dew drops on surface of leaves in winter morning.
D. Process *R* is decelerated if humidity in the air is high.

39. Given images show various steps in processing of cotton fibre into fabric. Arrange these steps in correct sequence.

(i) 
(ii) 
(iii) 
(iv) 
(v) 

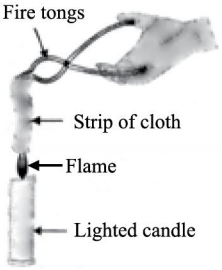
A. (iv) → (iii) → (ii) → (i) → (v)
B. (iv) → (ii) → (v) → (iii) → (i)
C. (iv) → (ii) → (iii) → (v) → (i)
D. (iv) → (i) → (ii) → (v) → (iii)

40. To increase the crop yield, farmers in an area started using chemical fertilisers and pesticides tremendously which caused runoff pollution of a river flowing nearby.
Which of the following graphs correctly shows the changes in levels of dissolved oxygen and bacteria present in this river?



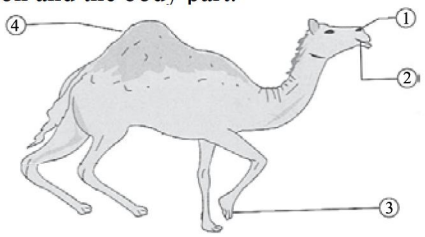
41. Read the features of a plant as given below.
(i) Roots are much reduced in size.
(ii) Stems are generally long and narrow.
(iii) Stems possess air spaces.
(iv) Leaves are large and flat.
(v) They have waxy upper surfaces.
To which of these habitats does this plant belong?
A. Desert B. Tropical rainforest
C. Aquatic D. Polar region

42. The given figure shows an experiment performed to study the nature of the given cloth. When the strip of cloth was burning it smelled like a burning grass, and is not self extinguishing. What is likely to be the nature of the cloth?



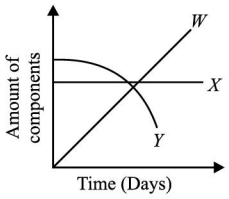
A. Wool B. Jute
C. Cotton D. Silk

43. A camel is shown here with some of its body parts labelled 1-4. Some adaptations of camel are given in the following list. Select the correct match of the adaptation and the body part.



a. Stored fat can be respired to release water
b. Help to eat thorny plants without injury
c. Large area makes movement more efficient
d. Can be closed to prevent entry of sand
A. a-2, b-3, c-4, d-1 B. a-4, b-2, c-3, d-1
C. a-1, b-2, c-3, d-4 D. a-3, b-4, c-1, d-2

44. A rubbish bin containing discarded food was carelessly left uncovered for five days. Various components during these days changed, which are plotted in the given graph.



Select the correct option regarding the components (*W*-*Y*).
A. *X* can be non-biodegradable material.
B. *W* can be the number of flies found at the rubbish bin.
C. *Y* can be the amount of biodegradable material present in the rubbish bin.
D. All of these

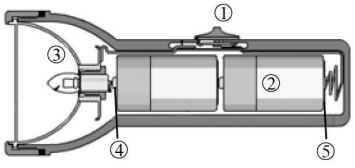
45. The table shows the composition and energy content of four common foods.

Food	Energy Content kJ g^{-1}	Composition					
		Protein / g	Fat / g	Carbo-hydrate / g	Vitamin C / mg	Vitamin D / mg	Iron / mg
P	3700	0.5	80	0	0	40	0
Q	150	1.2	0.6	7	200	0	0
R	400	2.0	0.2	25	10	0	8
S	1200	9.0	1.5	60	0	0	0

Select the correct option regarding it.
A. Shweta is affected with rickets, she should be preferably given food *P*.
B. Ms. Sharma is having an artery disease, she should prefer food *P*.
C. Rahul who is a body builder should prefer food *Q*.
D. Kanishka is having bleeding gums and joint pain, she should be preferably given food *R* and *S*.

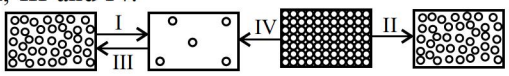
ACHIEVERS SECTION

46. The given figure shows the inside view of a torch. Identify the wrong statements regarding the marked parts and its respective descriptions.
(i) Part that either breaks the circuit or completes it - ①
(ii) Part which converts chemical energy into electric energy - ②
(iii) Part that reflects light - ③
(iv) Negative terminal of electric cell - ④
(v) Positive terminal of electric cell - ⑤



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

47. The given figure shows different arrangements of particles of an unknown substance undergoing changes I, II, III and IV.



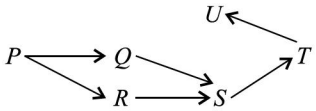
Fill in the blanks by choosing an appropriate option.
The change(s) *(p)* involve(s) absorption of heat while change(s) *(q)* involve(s) evolution of heat. In all these changes, *(r)* of the substance remains constant.

	(*p*)	(*q*)	(*r*)
A.	I, II	III, IV	Volume
B.	III	I, II, IV	Mass
C.	I, II, IV	III	Mass
D.	I, II, IV	III	Energy

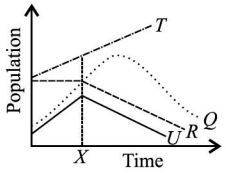
48. Read the given passage.
P is a modified underground stem and is an energy giving food. *Q* is a root that stores food and gets swollen. Nutrient present in *Q* keeps eyes and skin healthy. *R* and *S* are edible seeds. Nutrient in *R* gets stored in the body and keeps the body warm, while nutrient in *S* helps in growth and repair of body. *T* is edible leaf, the nutrient of which helps in formation of blood and its deficiency affects blood clotting.
Which of the following statements hold true regarding it?
(i) *P* could be potato and the deficiency of main nutrient present in it causes kwashiorkor.
(ii) *Q* could be carrot which contains vitamin A.
(iii) *R* could be groundnut that majorly yields oil.
(iv) *S* could be rajma or gram which is rich in fat.
(v) *T* could be spinach with main nutrients iron and vitamin K.

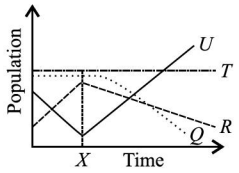
A. (i) and (ii) only B. (iii) and (iv) only
C. (ii), (iii) and (v) only D. (i), (iii) and (v) only

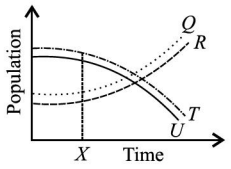
49. Refer to the given food web.

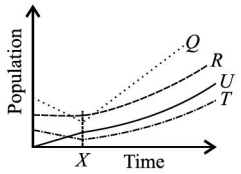


An organism '*X*' is introduced in this community which exclusively feeds on *S*. Which of the following graphs best illustrates the changes in populations of *Q*, *R*, *T* and *U* over time?

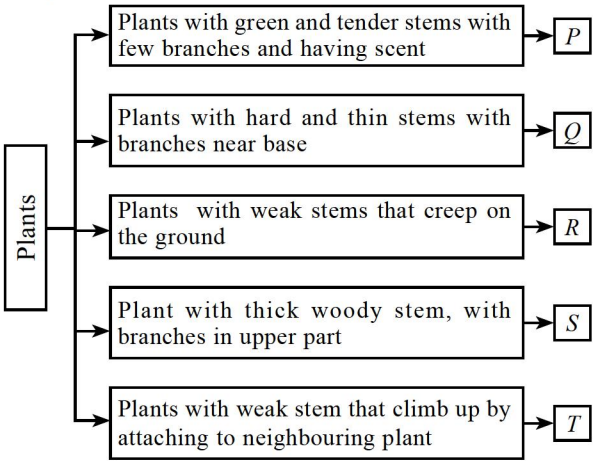
A. 

B. 

C. 

D. 

50. Study the given flow chart and select the correct option.



	P	*Q*	*R*	*S*	*T*
A.	Ginger, Banana	*Hibiscus*, Sweet pea	Rice, Gourd	Mango, Banyan	Mustard, Money Plant
B.	Tulsi, Bamboo	Coriander, Lemon	Turnip, Carrot	Neem, Teak	Black Pepper, Candytuft
C.	Wheat, Rice	Beetroot, Radish	Onion, Cucumber	Sugarcane, Coconut	Maize, Chickpea
D.	Mint, Fennel	Rose, Cotton	Grapevine, Pumpkin	Teak, Pine	Pea, Betel

SPACE FOR ROUGH WORK

CLASS24
ANSWER KEYS

14th NSO

1.	(B)	**2.**	(D)	**3.**	(B)	**4.**	(B)	**5.**	(A)	**6.**	(A)	**7.**	(C)
8.	(B)	**9.**	(A)	**10.**	(B)	**11.**	(B)	**12.**	(A)	**13.**	(B)	**14.**	(C)
15.	(B)	**16.**	(D)	**17.**	(B)	**18.**	(B)	**19.**	(B)	**20.**	(C)	**21.**	(B)
22.	(D)	**23.**	(C)	**24.**	(A)	**25.**	(A)	**26.**	(C)	**27.**	(D)	**28.**	(B)
29.	(D)	**30.**	(B)	**31.**	(C)	**32.**	(B)	**33.**	(C)	**34.**	(B)	**35.**	(A)
36.	(B)	**37.**	(B)	**38.**	(C)	**39.**	(B)	**40.**	(A)	**41.**	(C)	**42.**	(D)
43.	(A)	**44.**	(C)	**45.**	(A)	**46.**	(A)	**47.**	(B)	**48.**	(B)	**49.**	(C)
50.	(B)												

15th NSO

1.	(C)	**2.**	(C)	**3.**	(D)	**4.**	(C)	**5.**	(B)	**6.**	(A)	**7.**	(B)
8.	(D)	**9.**	(A)	**10.**	(C)	**11.**	(B)	**12.**	(A)	**13.**	(D)	**14.**	(B)
15.	(B)	**16.**	(D)	**17.**	(A)	**18.**	(B)	**19.**	(B)	**20.**	(B)	**21.**	(C)
22.	(A)	**23.**	(C)	**24.**	(B)	**25.**	(C)	**26.**	(C)	**27.**	(C)	**28.**	(C)
29.	(C)	**30.**	(D)	**31.**	(C)	**32.**	(A)	**33.**	(A)	**34.**	(D)	**35.**	(C)
36.	(A)	**37.**	(D)	**38.**	(A)	**39.**	(C)	**40.**	(D)	**41.**	(D)	**42.**	(A)
43.	(C)	**44.**	(D)	**45.**	(D)	**46.**	(D)	**47.**	(B)	**48.**	(A)	**49.**	(C)
50.	(A)												

16th NSO

1.	(B)	**2.**	(B)	**3.**	(C)	**4.**	(B)	**5.**	(C)	**6.**	(B)	**7.**	(C)
8.	(A)	**9.**	(B)	**10.**	(B)	**11.**	(C)	**12.**	(D)	**13.**	(C)	**14.**	(D)
15.	(C)	**16.**	(D)	**17.**	(B)	**18.**	(D)	**19.**	(C)	**20.**	(A)	**21.**	(D)
22.	(B)	**23.**	(B)	**24.**	(A)	**25.**	(D)	**26.**	(D)	**27.**	(B)	**28.**	(B)
29.	(D)	**30.**	(A)	**31.**	(B)	**32.**	(C)	**33.**	(D)	**34.**	(A)	**35.**	(B)
36.	(A)	**37.**	(B)	**38.**	(B)	**39.**	(D)	**40.**	(B)	**41.**	(A)	**42.**	(D)
43.	(C)	**44.**	(D)	**45.**	(B)	**46.**	(D)	**47.**	(C)	**48.**	(D)	**49.**	(C)
50.	(C)												

17th NSO-Level 2 was an online exam. Hence, paper cannot be included in the booklet.

18th NSO

1.	(B)	**9.**	(C)	**17.**	(C)	**25.**	(A)	**33.**	(D)	**41.**	(D)	**49.**	(C)
2.	(C)	**10.**	(D)	**18.**	(C)	**26.**	(D)	**34.**	(D)	**42.**	(A)	**50.**	(B)
3.	(D)	**11.**	(D)	**19.**	(A)	**27.**	(C)	**35.**	(C)	**43.**	(C)		
4.	(A)	**12.**	(C)	**20.**	(B)	**28.**	(C)	**36.**	(B)	**44.**	(B)		
5.	(C)	**13.**	(C)	**21.**	(D)	**29.**	(A)	**37.**	(D)	**45.**	(B)		
6.	(C)	**14.**	(C)	**22.**	(B)	**30.**	(D)	**38.**	(A)	**46.**	(B)		
7.	(B)	**15.**	(D)	**23.**	(C)	**31.**	(D)	**39.**	(A)	**47.**	(C)		
8.	(A)	**16.**	(C)	**24.**	(C)	**32.**	(B)	**40.**	(C)	**48.**	(C)		

CLASS24

19th NSO

1.	(C)	**2.**	(C)	**3.**	(B)	**4.**	(B)	**5.**	(B)	**6.**	(A)	**7.**	(C)
8.	(D)	**9.**	(A)	**10.**	(D)	**11.**	(B)	**12.**	(B)	**13.**	(A)	**14.**	(D)
15.	(B)	**16.**	(B)	**17.**	(C)	**18.**	(B)	**19.**	(D)	**20.**	(C)	**21.**	(B)
22.	(B)	**23.**	(C)	**24.**	(C)	**25.**	(B)	**26.**	(D)	**27.**	(C)	**28.**	(A)
29.	(A)	**30.**	(D)	**31.**	(B)	**32.**	(D)	**33.**	(B)	**34.**	(B)	**35.**	(C)
36.	(B)	**37.**	(A)	**38.**	(C)	**39.**	(D)	**40.**	(A)	**41.**	(C)	**42.**	(B)
43.	(B)	**44.**	(D)	**45.**	(A)	**46.**	(D)	**47.**	(C)	**48.**	(C)	**49.**	(C)
50.	(D)												

CLASS 6

LEVEL 2

QUESTION PAPER SET B

Techfest IIT Bombay

NSO

SOF NATIONAL SCIENCE OLYMPIAD 2018-19

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Total Questions: 50 | Time: 1 hr.

Guidelines for the Candidate

1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Section** and **Roll No.** clearly on the **OMR Sheet** and do not forget to sign it.
3. In the school code column in the OMR Sheet, please fill in code allocated to your school and not the exam center code.
4. The Question Paper comprises two sections : **Science** Section (45 Questions) and **Achievers Section** (5 Questions).
   Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.
5. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
6. There is only ONE correct answer. Choose only ONE option for an answer.
7. To mark your choice of answers by darkening the circles on the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only. E.g.

Q.16: In the water cycle, condensation is the process of

A. Water vapour cooling down and turning into a liquid

B. Ice warming up and turning into a liquid

C. Liquid cooling down and turning into ice

D. Liquid warming up and turning into water vapour

As the correct answer is option A, you must darken the circle corresponding to option A on the OMR Sheet.

16. ● Ⓑ Ⓒ Ⓓ

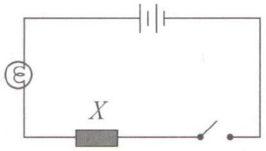
8. Rough work should be done in the blank space provided in this booklet.
9. Please fill in your personal details in the space provided on this page before attempting the paper.
10. **RETURN THE OMR SHEET AND QUESTION PAPER TO THE INVIGILATOR AT THE END OF THE EXAM.**

SOF
SCIENCE OLYMPIAD FOUNDATION
Inspiring Young Minds Through Knowledge Olympiads

Name:.....

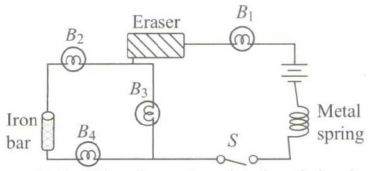
Section:..... SOF Olympiad Roll No.:..... Contact No.:.....

1. The electric circuit shown here was set up by Ramesh. He placed a 6 cm copper bar, X, in the electric circuit. He closed the switch and observed the brightness of the bulb. Ramesh then repeated the experiment, each time using copper bars of different lengths: 8 cm, 12 cm, 15 cm. The aim of his experiment was



A. To find out if the number of batteries affect the brightness of the bulb
B. To find out if the different positions of the copper bar in the electric circuit will affect the brightness of the bulb
C. To find out if the length of the bar affects the brightness of the bulb
D. To find out if the material of the bar affects the brightness of the bulb.

2. Four identical bulbs are connected in circuit as shown here.



When the switch S is closed, which of the bulb(s) will light up?

A. B_1 only
B. B_1 and B_4 only
C. B_2, B_3 and B_4 only
D. None of these

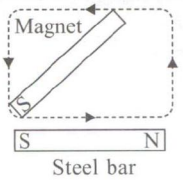
3. Sohan has three identical roses of different colours; red, yellow and pink. He shines a torch on the three roses one-by-one and gets a shadow on the wall in each case. Richa who is observing the shadows formed on the wall can

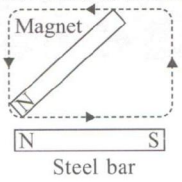
A. Distinguish shadow of the red rose only
B. Distinguish shadows of the red and yellow roses only
C. Distinguish shadows of all the three roses
D. Never distinguish the shadows of the three roses.

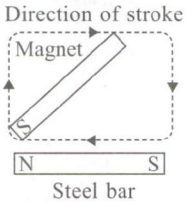
4. Which of the following statements is correct?

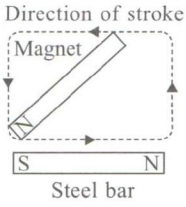
A. Wheels of a cycle moving at a constant speed undergo linear, rotational as well as random motion.
B. A hockey player running after the ball during a match undergoes linear and periodic motion.
C. The pendulum of a clock undergoes periodic motion only.
D. None of these

5. Which of the following is not possible when a steel bar is being magnetised by the stroking method?

A.


B.


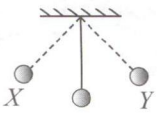
C.


D.


6. Which of the following unit conversions is wrong?

A. 1 km = 10^9 μm
B. 1 cm = 10^3 mm
C. 1 mg = 10^3 μg
D. 1 kg = 10^6 mg

7. The bob of a simple pendulum is swinging between points X and Y. It takes 15.6 s to swing thirty times from X to Y and back to X.



What is the time period of the pendulum?

A. 15.6 s
B. 1.92 s
C. 1.40 s
D. 0.52 s

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

	Column I		Column II
P.	Railway engine	(i)	Quintal
Q.	Packet of chilli powder	(ii)	kg
R.	Sack of wheat	(iii)	mg
S.	Bag of sand	(iv)	g
T.	Aspirin tablet	(v)	Metric ton

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

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

Statement 1 : When a horseshoe magnet is brought close to a pile of iron filings, more filings will get attracted to the curved part of the magnet.

Statement 2 : Horseshoe magnet has only one pole that is its curved part.

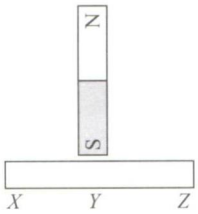
A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
C. Statement 1 is true but statement 2 is false.
D. Both statements 1 and 2 are false.

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

	Column I		Column II
P.	Distance	(i)	m/s
Q.	Speed	(ii)	s
R.	Volume	(iii)	m
S.	Time period	(iv)	m^3
T.	Density (= mass ÷ volume)	(v)	kg/m^3

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

11. The diagram shows a magnet being used to pick up a steel bar. The S-pole of the magnet is close to the centre *Y* of the steel bar as shown. What are the poles induced in the steel bar at *X*, *Y*, and *Z*?



	Pole induced at *X*	Pole induced at *Y*	Pole induced at *Z*
A.	N	N	N
B.	N	S	N
C.	S	N	S
D.	S	S	S

12. Which of the following statements is/are true?

I. An electric cell has two terminals, a positive terminal and a negative terminal while an electric bulb has one terminal.

II. An electric cell produces electricity from the chemicals stored inside it.

III. A break in the filament of a bulb indicates that the bulb is fused.

IV. Switch is a simple device that is used to break the circuit only.

V. Thomas Alva Edison invented the electric bulb and the electric cell.

A. I and II only B. II only

C. II and III only D. I, IV and V only

13. Which of the following statements is false?

A. Measuring tape is not suitable to measure the girth of a tree.

B. A suitable measuring device is must to measure the length of an object.

C. In ancient India, small length measurements used were an angul or a mutthi.

D. Electric trains, monorail, supersonic aeroplanes and spacecrafts are some of the 20th century contributions.

14. Study the given table carefully and select the correct statement regarding *P*, *Q*, *R* and *S*.

Rough materials	*P*	Miscible with water	Translucent
Rock	Graphite	Vinegar	Frosted glass
Bark of a tree	Metal spoon	Milk	Tracing paper
Sand paper	Iodine crystals	*R*	Oiled paper
Q	Copper vessel	Lemon juice	*S*

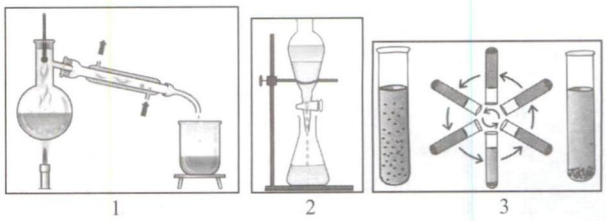
A. *P* can be replaced by metallic materials and *S* can be replaced by clear water.

B. *Q* can be replaced by pumice stone and *R* can be replaced by honey.

C. *P* can be replaced by lustrous materials and *S* can be replaced by aluminium foil.

D. Both B and C

15. Observe the given figures showing different methods of separation carefully and select the correct statements.



I. Method 1 is generally used to obtain pure water from muddy water.

II. Method 2 is used to separate components of a mixture which are miscible with each other and have different densities.

III. Method 3 is generally used to separate pulp from fresh fruit juice.

IV. Method 1 is based on the difference in boiling points of immiscible liquids while method 3 is based on the difference in size of components of a solid-solid mixture.

A. (I) and (IV) only B. (II) and (III) only

C. (II) and (IV) only D. None of these

16. Subhi, a class 6 student grouped together a few changes occurring around us as:

Group 1 : Blooming of flowers, breaking of glass, vaporisation of water, sawing of wood

Group 2 : Tides in the ocean, motion of a swing, landslides, occurrence of day and night

Group 3 : Rusting, germination of seeds, burning of fire crackers, growth of a child

Group 4 : Making a paper boat, blowing air into balloon, baking a *roti*, heating an iron rod

Select the odd one in each group and mention the property which makes it odd.

	Group 1	Group 2	Group 3	Group 4
A.	Blooming of flowers (Physical change)	Tides in the ocean (Periodic change)	Rusting (Chemical change)	Making a paper boat (Physical change)
B.	Breaking of glass (Irreversible change)	Occurrence of day and night (Natural change)	Germination of seeds (Irreversible change)	Blowing air into balloon (Reversible change)
C.	Sawing of wood (Physical change)	Motion of a swing (Periodic change)	Growth of a child (Irreversible change)	Heating an iron rod (Chemical change)
D.	Vaporisation of water (Reversible change)	Landslides (Non-periodic change)	Burning of fire crackers (Fast change)	Baking a *roti* (Chemical change)

17. Match the columns and select the correct option from the given codes.

	Column I		Column II
P.	Alcohol + Water	(i)	Sieving
Q.	Kerosene + Water	(ii)	Centrifugation
R.	Camphor + Common salt	(iii)	Separating funnel
S.	Milk + Cream	(iv)	Distillation
T.	Wheat flour + Rice	(v)	Sublimation

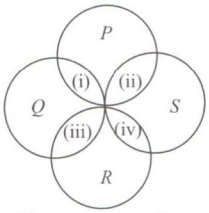
A. P-(v), Q-(ii), R-(iii), S-(iv), T-(i)
B. P-(iv), Q-(ii), R-(v), S-(iii), T-(i)
C. P-(iv), Q-(iii), R-(v), S-(ii), T-(i)
D. P-(iii), Q-(ii), R-(v), S-(i), T-(iv)

18. Read the given statements and state (T) for true and (F) for false ones.

I. Chalk powder mixed in wheat flour can be separated by sieving.
II. The solubility of a solute at a particular temperature cannot be increased by stirring.
III. The process of pouring out the clear upper liquid without disturbing the sediment is called sedimentation.
IV. Muddy water can be cleared faster using the method of loading.
V. Separating funnel is used to separate two miscible liquids.

	I	II	III	IV	V
A.	(F)	(T)	(T)	(F)	(F)
B.	(T)	(T)	(F)	(T)	(F)
C.	(F)	(T)	(F)	(T)	(F)
D.	(F)	(T)	(F)	(F)	(T)

19. Study the given Venn diagram.



If (i) is curdling of milk, (ii) is ripening of fruits, (iii) is volcanic eruptions and (iv) is spoilage of food, then which of the following best identifies *P*, *Q*, *R* and *S*?

	P	*Q*	*R*	*S*
A.	Chemical change	Irreversible change	Periodic change	Fast change
B.	Physical change	Periodic change	Non-periodic change	Slow change
C.	Periodic change	Desirable change	Non-periodic change	Fast change
D.	Desirable change	Non-periodic change	Undesirable change	Slow change

20. Match the columns and select the correct option from the given codes.

	Column I (Material)		Column II (Property)		Column III (Use)
P.	Plastic	(i)	Malleable	(a)	Pillows
Q.	Metal	(ii)	Transparent	(b)	Covering of electric wire
R.	Glass	(iii)	Insulator	(c)	Window panes
S.	Cotton	(iv)	Soft texture	(d)	Jewellery

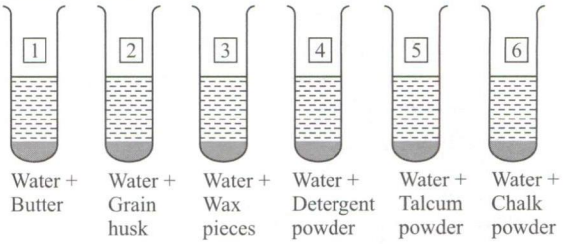
A. P-(ii)-(d), Q-(iii)-(a), R-(i)-(c), S-(iv)-(b)
B. P-(iii)-(b), Q-(i)-(d), R-(ii)-(c), S-(iv)-(a)
C. P-(ii)-(a), Q-(iii)-(b), R-(iv)-(c), S-(i)-(d)
D. P-(iii)-(b), Q-(ii)-(d), R-(i)-(c), S-(iv)-(a)

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

I. Opaque materials allow light to pass through them completely hence, we cannot see any object through them.
II. A feather, wooden cork and a straw, all float on water.
III. Liquids immiscible with water such as cooking oil, kerosene and mercury always form a separate layer at the bottom of water.
IV. Cooking utensils are provided with wooden or plastic handles because they are good conductors of heat.

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

22. Study the given experimental set-up and select the correct observation.



A. A homogeneous mixture will be formed in test tubes 4 and 5.
B. A heterogeneous mixture will be formed in test tubes 2 and 3 and solute particles will settle at the bottom after some time if left undisturbed.
C. Components in test tubes 5 and 6 are too small in size and hence cannot be separated by filtration.
D. A heterogeneous mixture is formed in test tubes 1 and 2 and solute particles will float on the surface of water.

23. Depending upon the nature of the constituents present in a mixture, Suhana, a class 6 student suggested some methods of separation as shown in the table.

	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/are incorrect method(s) of separation?

A. 1 and 2 only
B. 3 only
C. 1 and 5 only
D. 4 only

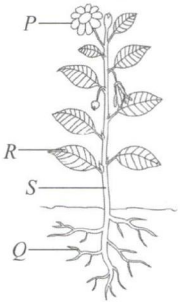
24. Select the correct statement.
A. Expansion gaps are deliberately left between the rails to allow for the contraction of the rails in hot weather.
B. Solids, liquids and gases expand to the same extent if equal amount of heat is supplied.
C. On cooling, solids contract the least while gases contract the most.
D. None of these

25. A few common materials are listed in the box.

(i) Gold	(ii) Chalk	(iii) Glycerine	(iv) Wax
(v) Clay	(vi) Rubber band	(vii) Metal coin	

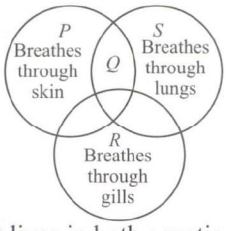
Which of the following statements is/are incorrect regarding these materials?
I. (i) is ductile while (ii) is brittle.
II. (iv), (v) and (vii) will sink in water.
III. (i) is rigid while (vi) is elastic.
IV. (iii) is a liquid immiscible with water.
A. I and III only B. II and IV only
C. III and IV only D. I, II, III and IV

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



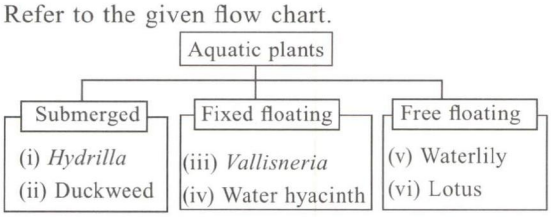
A. *P* is the plant part that later produces seeds and in some plants like cabbage and broccoli it gets modified to store food.
B. *Q* transports water and minerals from soil to other plant parts and in some plants like turnip and carrot it gets modified to store food.
C. Lettuce and spinach have edible *R* and in some plants like pea and grapevine it gets modified into thread like structures that help in climbing up.
D. *S* is the plant part that helps to keep the plant upright and is modified into thorns in some plants for protection.

27. Study the given Venn diagram. Identify *P*, *Q*, *R* and *S* and select the incorrect statement regarding them.



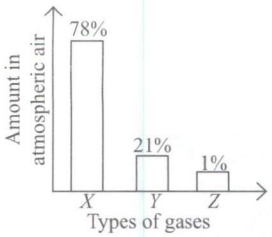
A. *P* could be an organism that helps in recycling of nutrients in the biosphere.
B. *Q* could be an organism that lives in both aquatic as well as terrestrial habitat.
C. *S* may possess thick layer of fat under the skin which is called blubber.
D. *R* could be a warm blooded animal that possesses hard waterproof scales.

28. Refer to the given flow chart.



Which of the following is/are correctly placed?
A. (i), (v) and (vi) only B. (i) only
C. (ii), (iii), (iv) and (v) only D. (iv) only

29. Study the given graph. Identify gases *X*, *Y* and *Z* and select the correct statement.



A. Gas *Y* is used for respiration and extinguishing fire.
B. Autotrophs use *X* and *Z* gases directly to prepare their food in the presence of sunlight.
C. *X* does not help in burning of substance and is used in food packaging to keep the food fresh.
D. None of these

30. Pick the odd one out from each of the given groups (i-iv) on the basis of their respiratory organs and select the correct option.
(i) Emu, Lizard, Sparrow, Grasshopper
(ii) Dolphin, Rabbit, Earthworm, Crocodile
(iii) Cockroach, Beetle, Mosquito, Sea horse
(iv) Duck, Whale, Seal, Pomfret

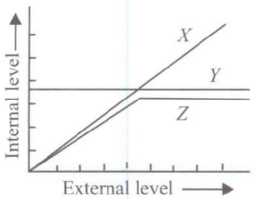
	(i)	(ii)	(iii)	(iv)
A.	Grasshopper	Earthworm	Sea horse	Pomfret
B.	Lizard	Dolphin	Mosquito	Seal
C.	Grasshopper	Crocodile	Sea horse	Duck
D.	Sparrow	Rabbit	Mosquito	Whale

31. Study the given table.

Characteristic	Organism			
	P	*Q*	*R*	*S*
Streamlined body	✓	✓	✓	×
Endoskeleton present	✓	✓	×	✓
Hollow bones	✓	×	×	×

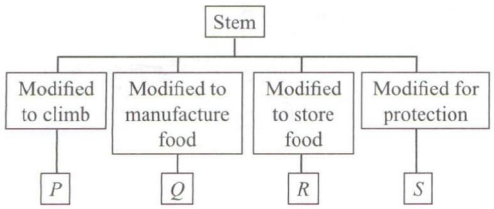
Which of the following statements is true regarding *P*-*S*?
A. *P* may possess three pairs of jointed legs which help to walk, run and climb.
B. *P* and *Q* may breathe through lungs.
C. *S* could possess long eyelashes and ear hair for protection from sand whereas *R* could possess thick fur on its body to protect it from cold.
D. *P* may possess flat fins and tail that help to move, change direction and keep the body balanced in water.

32. The given graph represents how three different living organisms (*X*, *Y* and *Z*) cope with the external environmental conditions. Study the graph and select the correct option regarding *X*, *Y* and *Z*.



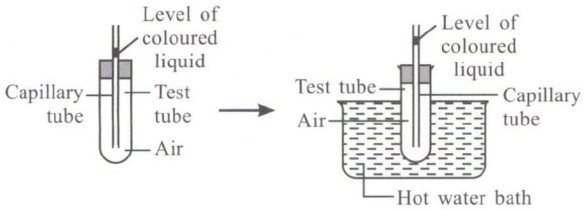
A. *X* could be sloth.
B. *Y* could be sparrow.
C. *Z* could be toucan.
D. *X* could be seal.

33. Refer to the given flow chart and select the option that correctly identifies *P*, *Q*, *R* and *S*.



A. *P*-Betel; *Q*-*Aloe;* *R*-Ginger; *S*-Banyan
B. *P*-Poison ivy; *Q*-Cactus; *R*- Potato; *S*-Ginger
C. *P*-Passion flower; *Q*-*Opuntia;* *R*-Onion; *S*-*Bougainvillea*
D. *P*-Money plant; *Q*-*Aloe;* *R*-Radish; *S*-Potato

34. Ravi conducted an experiment as shown here.



Step I Step II

What could be the reason for the rise in the level of coloured liquid in the capillary within the test tube in step II?

A. When test tube was placed in hot water bath, air present within the test tube expanded due to heat.
B. When test tube was placed in hot water bath, air present within the test tube contracted due to heat.
C. Water in the water bath contracted due to placement of air-filled test tube in it.
D. None of these

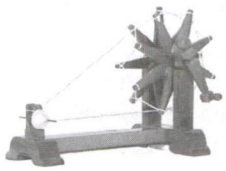
35. A scientist conducted a study on four different species of organisms *P*, *Q*, *R* and *S* in a terrestrial food chain. He estimated the total number of individuals in the population of each species and the average biomass of each individual.

Species	Average biomass of each individual (arbitrary units)	Number of individuals
P	32	95
Q	17	45
R	5000	250
S	15000	4500

Which of the following shows the correct relation of these species in a food chain?

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

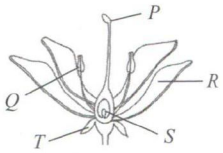
36. The tool shown in the given figure is used in process *X* to produce *Y* from *Z*.



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

	X	*Y*	*Z*
A.	Weaving	Fibre	Fabric
B.	Spinning	Yarn	Fibre
C.	Knitting	Fabric	Fibre
D.	Spinning	Fabric	Yarn

37. Refer to the given figure and select the incorrect statement regarding its labelled parts.



A. '*T*' is the outermost accessory whorl that protects the flower during its development.
B. '*Q*' and '*P*' are innermost essential whorls.
C. Function of '*Q*' is to receive the pollen grains from '*P*' during pollination.
D. '*R*' is usually brightly coloured and helps in pollination.

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

(i) Process by which waste materials are used to make new products - Recycling
(ii) Large open areas used for solid waste disposal - Landfills
(iii) Biomedical waste - Incineration

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

39. Compound leaves are present in

A. *Hibiscus* B. Peepal
C. Banana D. Neem.

40. Read the given passage where some of the words have been italicised.

Cotton plant is an *annual* shrub. It grows best in *cold* climate. *Black* soil is best suited for the cultivation of cotton plant. The *stems* of cotton plant are called cotton bolls. The seeds with cotton fibres are picked from the cotton bolls by hand. After picking, the fibres are separated from the seeds by a process called *combing*.

Select the correct option regarding this.

A. *Annual* should be replaced by *biennial* and *stems* should be replaced by *roots*.
B. *Cold* should not be replaced as it is correctly mentioned.
C. *Black* should be replaced by *red* and *stems* should be replaced by *fruits*.
D. *Combing* should be replaced by *ginning*.

41. Kusum grouped plants broadly on the basis of type of venation present in their leaves. In one of the groups she placed an incorrect member by mistake. Identify the group in which incorrect member is placed.

A. *Petunia*, Pea, *Hibiscus*
B. Onion, Bamboo, Gram
C. Coriander, Spinach, Mango
D. Sugarcane, Grass, Banana

42. Study the given list of source of water.

(i) Sea (ii) Well
(iii) Stream (iv) River
(v) Hand pump (vi) Tube well
(vii) Ocean (viii) Pond
(ix) Lake

Which of the following options correctly identifies the numbers of source of surface water (X) and source of ground water (Y)?

	X	Y
A.	6	3
B.	7	2
C.	5	4
D.	3	6

43. Read the given passage.

X is a plant that is evergreen and possesses narrow needle like leaves, Y is the plant that possesses specialised tips called drip tips and Z is the plant that possesses green stem to make food.

Identify X, Y and Z and select the correct statement.

A. Plant X is found in area where animals possess sticky pads on feet whereas plant Y is found in area where animals usually excrete very concentrated urine.

B. Plant Z is found in area where animals usually undergo hibernation whereas plant Y is found in area where animals usually undergo aestivation.

C. Plant X is found in area where animals are usually nocturnal and plant Z is found in area where animals possess blubber.

D. None of these

44. Kanika noticed that her potted plant was not growing healthily. She put few 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.

45. Study the given table.

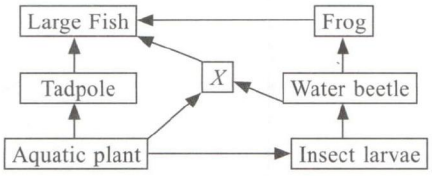
Characteristics	Plants		
	P	Q	R
Its positively geotropic part stores food	✓	×	×
Stem helps in multiplication of plant vegetatively	×	×	✓
Stem manufactures food	×	×	×
Root helps in climbing	×	✓	×

Select the option that correctly identifies P-S.

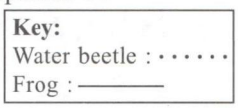
A. P-Turnip; Q-Betel; R-Ginger
B. P-Onion; Q-Pea; R-Potato
C. P-Ginger; Q-*Bougainvillea*; R-Carrot
D. P-Tapioca; Q-Sweet pea; R-Jimikand

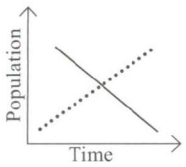
ACHIEVERS SECTION

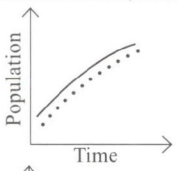
46. Refer to the given food web.

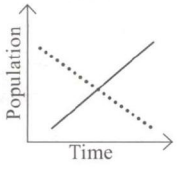


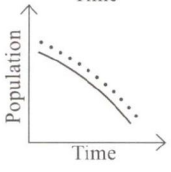
A new species Y was introduced in this community which exclusively feeds on X. Which of the following graph correctly represents population of frog and water beetle after introducing species Y?



A.


B.


C.


D.


47. Properties of a few substances are given as :

P : White solid, soluble in water, non-magnetic in nature, salty in taste

Q : Blue solid, insoluble in water, non-magnetic in nature, sweet in taste

R : White solid, soluble in water, non-magnetic in nature, sweet in taste

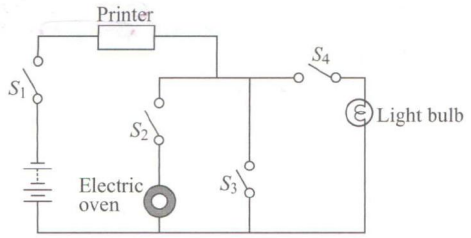
S : Black solid, magnetic in nature, insoluble in water

Read the given passage and fill in the blanks by selecting an appropriate option.

Substances __(i)__ when present in a mixture can be separated from each other by filtration or magnetic separation, substances __(ii)__ can be separated by magnetic separation only, while substances __(iii)__ when mixed in water are very difficult to separate by common methods of separation.

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

48. The circuit diagram shows four different switches and some wires connected to a light bulb, an electric oven and a printer.

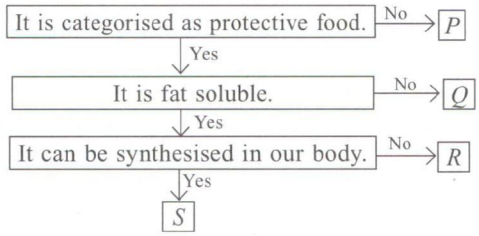


Which of the switches must be closed in order to have the following energy conversion only?

Chemical energy → electrical energy → kinetic and sound energy

A. S_2 only
B. S_1 and S_2 only
C. S_1 and S_3 only
D. S_1, S_2 and S_4 only

49. Refer to the given flow chart and select the correct statement regarding it.



A. Deficiency of P could cause marasmus whereas deficiency of Q could cause night blindness.
B. R could help in proper functioning of nerves and muscles whereas S could be found in blood that neutralises the effects of bacteria and viruses.
C. Q could help in red blood cell production whereas R could help in calcium absorption.
D. P could get stored in the body cells as glycogen whereas deficiency of Q could cause pellagra.

50. Nisha and Neha were playing together on a street where they accidentally collided with each other and fell down. After that, Neha started feeling pain in her elbow and could not bent it easily. Nisha also developed discomfort in one of her wrists and had difficulty in writing. They visited doctor who told them that their joints were injured.

Identify their injured joints and select the correct option regarding them.

	Nisha	Neha
A.	Injured joint is the type of joint also present between metacarpal and carpal of thumb.	Injured joint is the type of joint also present between skull and first vertebra of backbone.
B.	Injured joint is the type of joint also present between upper arm and forearm.	Injured joint is the most freely movable joint of body.
C.	Injured joint is the type of joint also present between tarsal bones.	Injured joint allows movement primarily in one plane.

D. None of these

SPACE FOR ROUGH WORK

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CLASS24

CLASS - VI | **2018-19**

NSO (LEVEL-II) **ANSWER KEY**

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	4	4	4	4	2	4	1	4	3	3	3	1	2	4	3	3	3	4	2
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	1	4	4	3	2	4	4	2	3	1	2	2	3	1	1	2	3	3	4	4
Que.	41	42	43	44	45	46	47	48	49	50										
Ans.	2	1	4	4	1	2	2	3	4	3										