

CLASS

5

SET-B

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

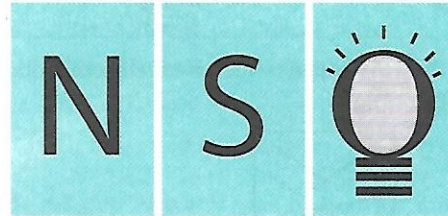
Name:

Section: Roll No.:

Contact No.

Total Questions: 50

Time: 1 hr.



**19TH SOF NATIONAL
SCIENCE OLYMPIAD**

Guidelines for the Candidate

1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Section, Roll No.** and **% of marks/grade** in last class clearly on the **OMR Sheet** and do not forget to sign it.
3. The Question Paper comprises three sections:
Logical Reasoning (10 Questions), **Science** (35 Questions) and **Achievers Section** (5 Questions)

Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.

4. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
5. There is only ONE correct answer. Choose only ONE option for an answer.
6. To mark your choice of answers by darkening the circles in the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only. E.g.
Q. 16: Raj goes to school on a bicycle. Which of these safety rules he should follow?
A. He should give signals before taking turns.
B. He should keep to the right of the road.
C. He should cross the road by using zebra crossing.
D. All of these

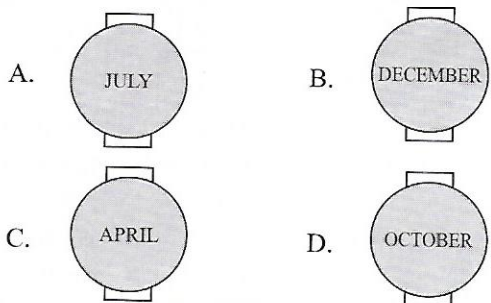
As the correct answer is option A, you must darken the circle corresponding to option A in the OMR Sheet.

16. ● (B) (C) (D)

7. Rough work should be done in the blank space provided in the booklet.
8. Return the OMR Sheet to the invigilator at the end of the exam.
9. Please fill in your personal details in space on top of this page before attempting the paper.

LOGICAL REASONING

1. Select the odd one out.



2. Select a figure from the options which is exactly embedded in the given Fig. (X).

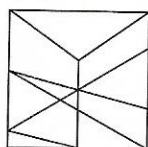
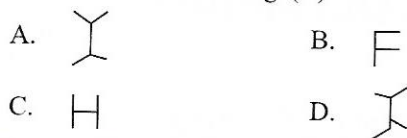


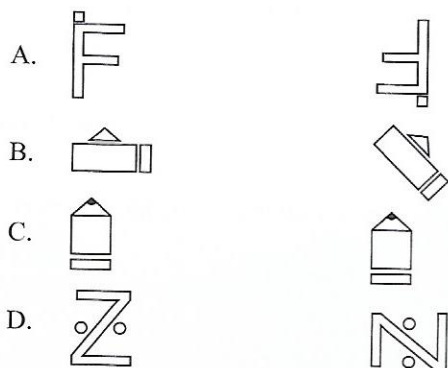
Fig. (X)



3. Select the CORRECT match.

Figures

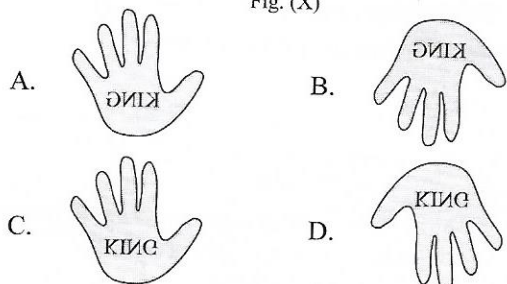
Figures after 90° clockwise rotation



4. Find the correct mirror image of Fig. (X), if the mirror is placed vertically to the left.



Fig. (X)



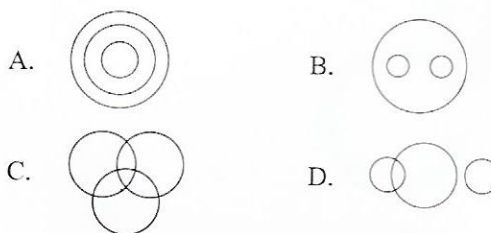
5. Mohit remembers that his niece Trishu had certainly been in Pune for one day after 16th February but before 21st February. While Mohit's mother remembers that Trishu had certainly visited Pune before 20th February but after 17th February. If both of them are correct, then on which day in February had Trishu visited Pune?

- A. 18th B. 19th
C. Either 18th or 19th D. 20th

6. How many meaningful three letter words can be formed with the letters ACR using each letter only once in each word?

- A. None B. One
C. Two D. Three

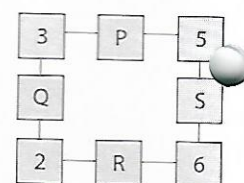
7. Select the Venn diagram from the options which best depicts the relationship amongst 'Girls, Athlete, Singers'.



8. If 'Clock' is called 'Television', 'Television' is called 'Radio', 'Radio' is called 'Oven', 'Oven' is called 'Grinder' and 'Grinder' is called 'Iron', then in what will a lady bake a cake?

- A. Radio B. Oven
C. Grinder D. Iron

9. Find P + Q + R + S, so that the sum of all the numbers along each line is 15.



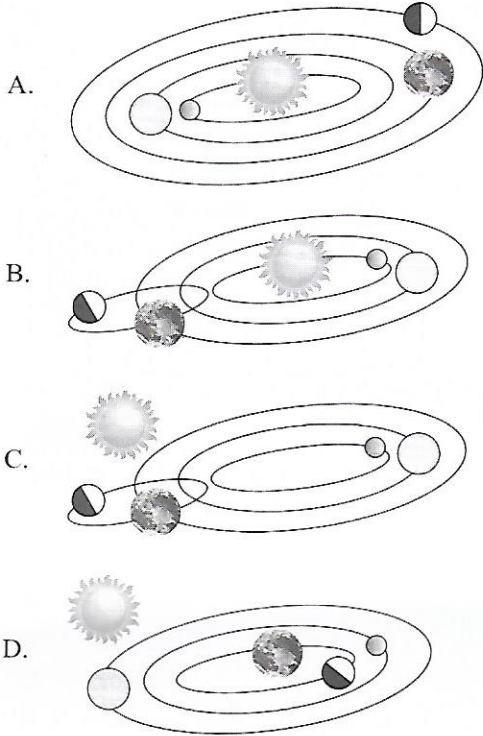
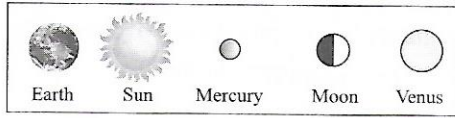
- A. 28
B. 27
C. 24
D. 23

10. If and

then $\triangle =$

- A.
B.
C.
D.

11. Which of the following figures shows the correct positions of the given celestial bodies in the solar system?



12. The breaking news flashed on the television is shown here. The calamity being talked about here is

- A. Avalanche
- B. Landslide
- C. Earthquake
- D. Famine.

A collapse of huge mass of rocks was observed on a cliff in Darjeeling after rains, no casualties.

13. The relationship between crop products of two different seasons is shown here.

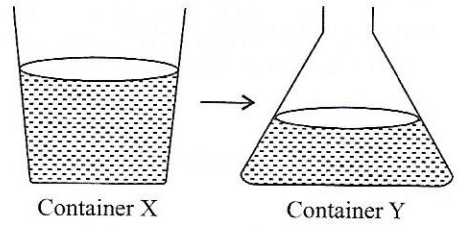
Peanut : Potato

Which of the following options also satisfies the same relationship?

- A. Beans: Wheat
- B. Wheat: Legumes
- C. Maize: Rice
- D. Rice: Wheat

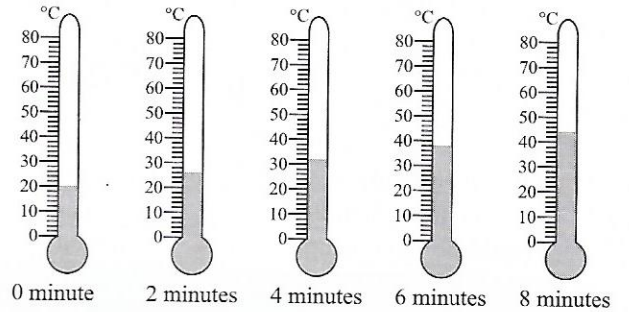
14. The given figure shows two containers, X and Y of different shapes. Farheen filled container X with 100 mL of water. She then poured all the water from container X to container Y.

Which of the following changes did she observe in container Y?



- (i) Change in shape of water
 - (ii) Decrease in mass of water
 - (iii) Change in level of water
 - (iv) Decrease in volume of water
- A. (i) only B. (iii) only
C. (i) and (iii) only D. (i), (ii), (iii) and (iv)

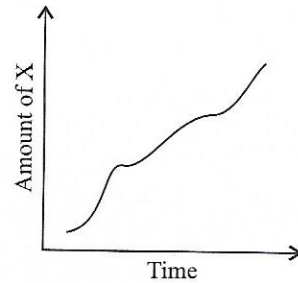
15. A cup of water was heated for 8 minutes. The given thermometers show the temperature readings during different times of heating.



What could be the temperature when it was heated for 3 minutes?

- A. 27
- B. 28
- C. 29
- D. 30

16. A pollution monitoring agency plotted the change in amount of X on the earth over time as shown here.



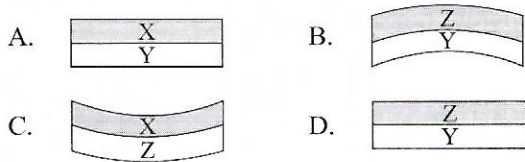
Select the most suitable option regarding the graph.

- A. If X is UV rays reaching the earth, then it indicates acid rain.
- B. If X is carbon dioxide content in the air, then it indicates increased global warming.
- C. If X is ozone content in the atmosphere, then it indicates ozone layer depletion.
- D. None of these

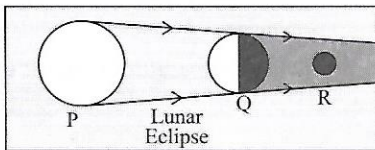
17. Identify the group that contains one example each of the three types of rocks and select the correct option.
- Granite, Pumice, Slate
 - Obsidian, Sandstone, Marble
 - Limestone, Conglomerate, Quartzite
 - Slate, Gneiss, Chalk

18. The floating ribs are not attached to the _____ but only to the _____.
- Breastbone, backbone
 - Backbone, breastbone
 - Backbone, ribcage
 - Ribcage, breastbone

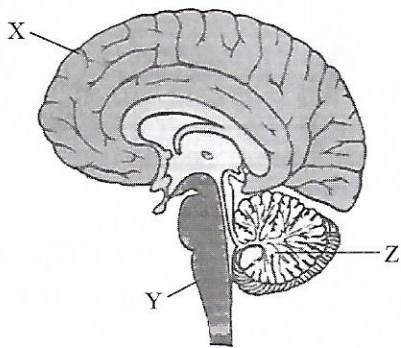
19. The order of the expansion of three metals X, Y and Z is $X = Y > Z$. Then, which of the following would be observed if bimetallic strips made of any two of these metals are heated?



20. The given figure shows a lunar eclipse. In case of a solar eclipse, the positions of _____ and _____ should be interchanged.



- P, Q
 - Q, R
 - R, P
 - Any of these
21. Match the labelled parts X, Y and Z in the given figure with the statements given below and select the correct option.



- Controls breathing, heartbeat, swallowing, vomiting and coughing.
- It allows us to accurately follow directions on a map.
- Alcohol affects this part the most.

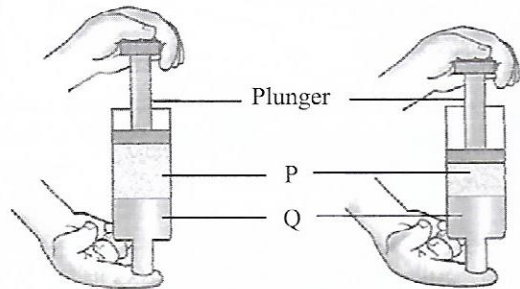
	X	Y	Z
A.	(i)	(iii)	(ii)
B.	(ii)	(i)	(iii)
C.	(iii)	(ii)	(i)
D.	(i)	(ii)	(iii)

22. The organism shown here migrates



- To reproduce
- To escape harsh weather
- In search of food
- In search of shelter.

23. Two substances, P and Q, were used to fill a syringe. The plunger was then pushed in as shown in the diagram.

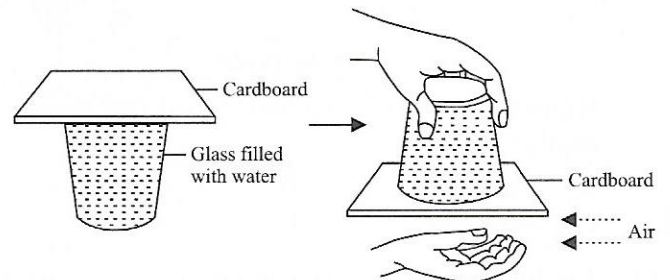


Which of the following would most likely be P and Q?

	P	Q
A.	Oil	Salt
B.	Rice	Oxygen
C.	Air	Water
D.	Flour	Water vapour

24. Take a glass and fill it with water upto the brim. Make sure there are no air bubbles. Take a thick, stiff piece of cardboard and place it over the glass. Hold the glass with one hand and place your other hand over the cardboard and quickly turn the glass upside down. Now, slowly remove your hand from the cardboard.

What will happen in the given activity if a fast air is blown below the cardboard?



- The cardboard will fall off.
- The cardboard will be harder to remove from the glass.
- The cardboard will bend into the glass.
- None of these

25. A pulley is a simple machine that makes our work easier by making the direction of force applied to be in the opposite direction of the force that
- Opposes the motion of an object by acting between the surface and the object
 - Pulls any object towards earth's core
 - Is exerted by magnet on an iron material
 - Produces current in circuits.

26. When the iodine test is performed on the leaf of a well-watered croton plant put in an airy and well lit place, the leaf shows patches of blue-black and colourless areas.

This is so because _____ .

- Croton is a desert plant where only stem performs photosynthesis
- Croton plant cannot make its food in presence of direct light
- Croton leaves are patterned and have chlorophyll in some areas only
- The experiment has not been done carefully

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

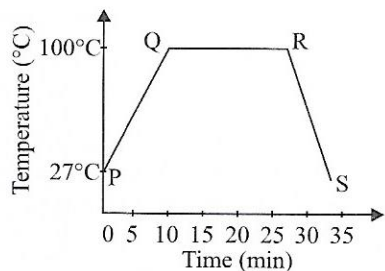
Column I

Column II

- | | |
|-------------|--------------------------------|
| a. Vitamins | (i) Keep body warm |
| b. Roughage | (ii) Formation of bones |
| c. Minerals | (iii) Fight diseases |
| d. Proteins | (iv) Build muscles |
| e. Fats | (v) Helps in removal of faeces |

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

28. An experiment was carried out with water by a group of pupils and the given graph was plotted to show their results. What processes are taking place between PQ, QR and RS?



- | | | | |
|----|-----------|-----------|-----------|
| | PQ | QR | RS |
| A. | Boiling | Cooling | Heating |
| B. | Boiling | Heating | Cooling |
| C. | Heating | Cooling | Boiling |
| D. | Heating | Boiling | Cooling |

29. X is an animal that lays eggs and takes care of its eggs and hatched young ones till they become able to survive on their own. Y is an animal that lays eggs and leaves them on their own. Now, select the option that correctly identifies X and Y.

	X	Y
A.	Frog	Rat
B.	Snake	Rabbit
C.	Lizard	Crocodile
D.	Pigeon	Salmon

30. Rohit prepared two mixtures as given below:

Identify the separation methods that can be used to obtain the components of mixtures X and Y separately.

X	: Salt + Water
Y	: Sand + Water

	X	Y
A.	Filtration	Sedimentation and decantation
B.	Distillation	Churning
C.	Filtration	Distillation
D.	Distillation	Filtration

31. The given table classifies diseases into two groups on the basis of some similarity. Select the disease that can be placed at X.

Group 1	Group 2
Diabetes	Tuberculosis
Allergy	X
Anaemia	Measles

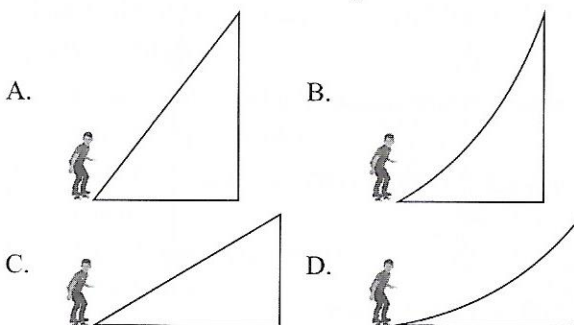
- Rickets
- Typhoid
- Asthma
- Scurvy

32. The given box lists some animals. Which two of them have same respiratory organs?

(i)	Tadpole	(ii)	Shark
(iii)	Frog	(iv)	Dolphin
(v)	Grasshopper	(vi)	Lizard
(vii)	Mosquito	(viii)	Salmon

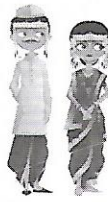
- (i) and (iii) only
- (v) and (vii) only
- (ii) and (iv) only
- (vi) and (viii) only

33. Which ramp setup will require the highest amount of force for the skater to move up on it?



34. The couple shown here belongs to the state which is located in _____ India.

- A. Eastern
- B. Northern
- C. Western
- D. Southern



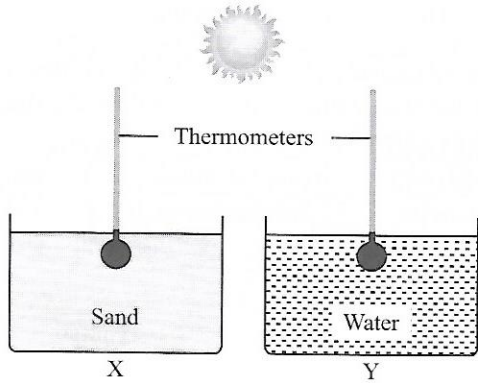
35. A cooking method which does not involve use of oil is _____.

- A. Frying nuggets
- B. Steaming rice
- C. Boiling eggs
- D. Both B and C

36. Select an option that correctly compares the features of natural and synthetic fibres.

- | Natural fibres | Synthetic fibres |
|------------------|------------------|
| A. Waterproof | Non-waterproof |
| B. Wrinkle free | Wrinkle prone |
| C. Quick drying | Slow drying |
| D. None of these | |

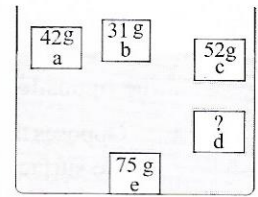
37. Neetu set-up an experiment as shown here.



What will be the level of mercury in thermometers placed in beakers X and Y after 30 minutes?

- | | X | Y |
|----|---------------|---|
| A. | | |
| B. | | |
| C. | | |
| D. | None of these | |

38. Five objects a, b, c, d and e, of the same volume but different masses, are put into a tank of water as shown here.



Which of the following is most likely to be the mass of object d?

- A. 35 g
- B. 48 g
- C. 64 g
- D. 80 g

39. The movement of the joint present between our thigh bone and shin bone can be compared to the movement of _____.

- A. Door hinges
- B. Joystick
- C. Pestle in a mortar
- D. None of these

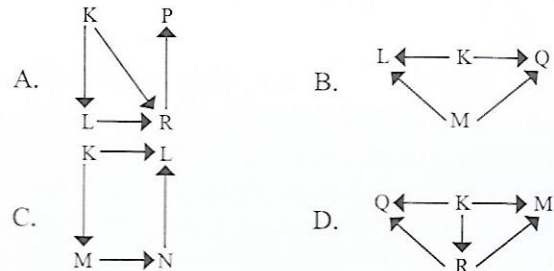
40. X reproduces with the help of tiny structures called spores. It gets its food from decaying matter. It is a/an _____.

- A. Fern
- B. Mushroom
- C. Mango
- D. Alga

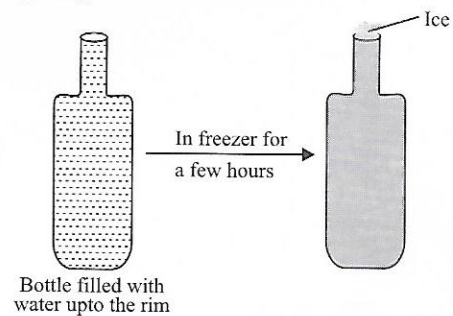
41. Study the given table.

Plant	Herbivores	Carnivores	Omnivores
K	L and M	N and P	Q and R

Which of the following food webs correctly shows the food relationships of some organisms in the table above?



42. Ajay filled a bottle upto the rim with water, and placed it in the freezer. What he saw after a few hours is shown in the figure given here. What does it show?



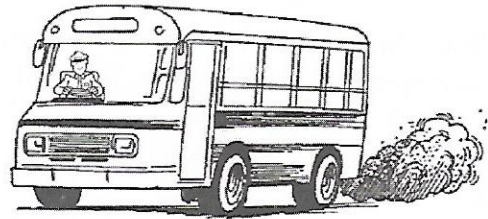
- A. Freezing decreases mass of water.
- B. Freezing compresses water.
- C. Freezing increases volume of water.
- D. Freezing increases mass of water.

43. In case of heat stroke, what should be done immediately?
- Cover the patient with any cloth, preferably with woollen cloth.
 - Give the patient a solution of salt, sugar and lime or preferably juice of an unripe mango.
 - Make the patient lie down in a sunny place.
 - Give hot tea or coffee to the patient.

44. Which of the following events will result in a decrease in the population of butterflies?
- Increase in the population of birds
 - Increase in the supply of plant fertilisers
 - Reduction in the number of flowering plants
 - Increased use of insecticides by man in gardens and green belts

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

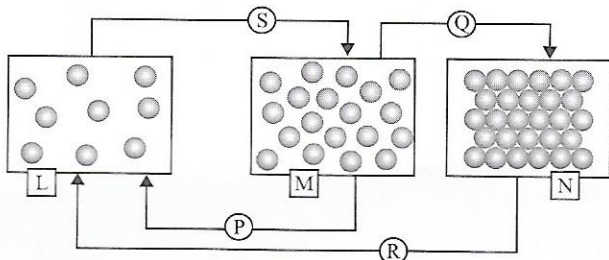
45. Study the given diagram. What can the bus-driver do to reduce the pollution caused by his bus?



- Send the bus for servicing more regularly
- Tie a plastic bag around the exhaust pipe
- Use a bigger exhaust pipe
- Put a silencer at the exhaust pipe

ACHIEVERS SECTION

46. Refer to the given diagrams 'L', 'M' and 'N' showing three states of matter.



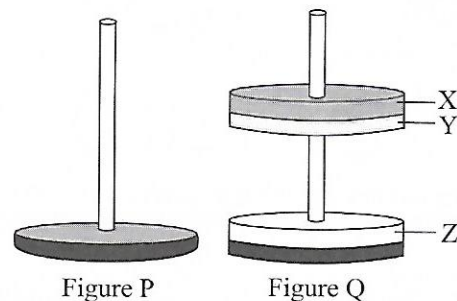
The arrows P, Q, R and S represent processes involved in the interchange of states of matter. Identify P, Q, R and S.

- | | P | Q | R | S |
|----|--------------|--------------|-------------|--------------|
| A. | Freezing | Melting | Evaporation | Condensation |
| B. | Evaporation | Condensation | Melting | Freezing |
| C. | Condensation | Evaporation | Heating | Freezing |
| D. | Evaporation | Freezing | Sublimation | Condensation |
47. Read the given passage.

Deep inside the earth, there is hot molten rock called *P* which comes up and collects in a chamber. When the pressure in the chamber builds up, *P* finds a release through an opening or a crack in the crust of the Earth, called volcano. When *P* erupts through volcano, it is called *Q*. The eruption contains gases, pieces of rocks and *Q* that comes out from *R*, an outlet in the earth's surface. *Q* and ash that are thrown out, collect and after repeated eruptions, form a mountain on cooling down. The hollow top of this mountainous volcano is shaped like a bowl, called *S*.

Select the correct option regarding it.

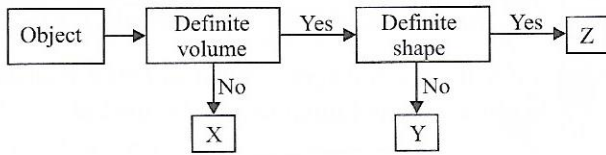
- The release of *Q* is always very violent and it comes out with an explosion.
 - The intense pressure inside the earth pushes *P* towards the surface of the earth and generally *P* cools just below the earth's surface and then hardens to form igneous rocks.
 - Release of *Q* from *R* causes global warming.
 - Both B and C
48. A wooden rod is attached to a wooden disc to form a support structure as shown in figure P and then three metal rings X, Y and Z are placed above the wooden disc as shown in figure Q.



Which of the following conditions can be true regarding the given setup?

- Rings X and Y are both magnets with their opposite poles facing each other.
- Both Y and Z are magnets while X is a magnetic material.
- Rings Y and Z are both magnets with their similar poles facing each other.
- All of these

49. Study the given flow chart.

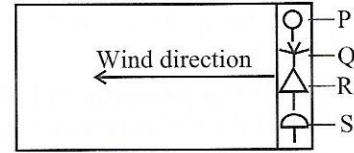


Which of the following options correctly identifies the examples that belong to X, Y and Z?

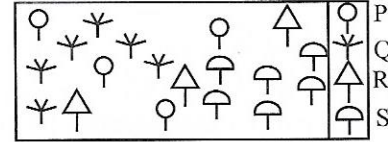
	X	Y	Z
A.	Book	Air	Blood
B.	Water	Electricity	Oxygen
C.	Nitrogen	Syrup	Vase
D.	Stapler	Cheese	Milk

50. Mr. Bhatt ploughed a field and killed all the weeds. He left plants P, Q, R and S growing on one side of the field and then left the field untouched for one

month as he went out of the city. The wind blew in the same direction for the whole month.



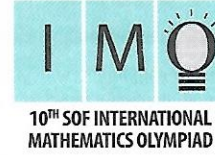
When he returned, this is what he saw:



Which one of the plants P, Q, R and S is likely to have its seeds dispersed by wind?

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

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