

SOF NATIONAL SCIENCE
OLYMPIAD 2018-19

CLASS
5

LEVEL
2

QUESTION PAPER SET

B

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. ● (B) (C) (D)

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.**

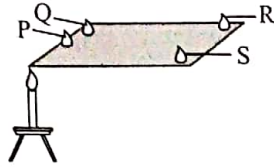


Name:.....

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

1. P, Q, R and S are drops of wax placed on a rectangular piece of metal. When the metal frame is heated at the point shown in the diagram, the drops of wax will melt. Which of the following shows the correct order in which the drops of wax will melt?

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



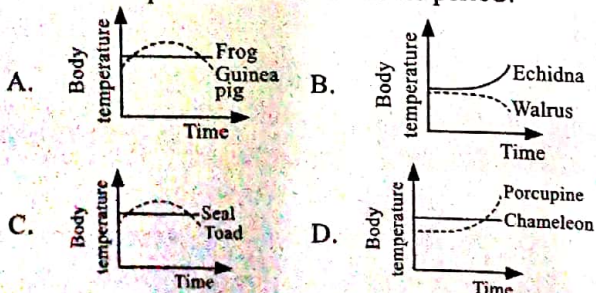
2. Match column I (nutrient) with column II (function) and column III (deficiency symptom) and select the correct option from the given codes.

Column I	Column II	Column III
P. Vitamin C	(i) For normal functioning of thyroid glands	(a) Anaemia
Q. Iodine	(ii) Maintains normal vision	(b) Scurvy
R. Iron	(iii) Helps in keeping gums and joints healthy	(c) Goitre
S. Vitamin A	(iv) Required for haemoglobin formation	(d) Night blindness

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

3. Select the correct statement out of the following.
- A. Sandy soil needs regular addition of fertilisers as it holds a larger amount of water.
 - B. Loamy soil has good qualities of both sandy and clayey soil and thus is most suitable for pottery.
 - C. Clayey soil develops cracks in hot weather causing harm to the roots of plants, thus is not suited for agriculture.
 - D. The water holding capacity is highest in clayey soil and lowest in loamy soil.

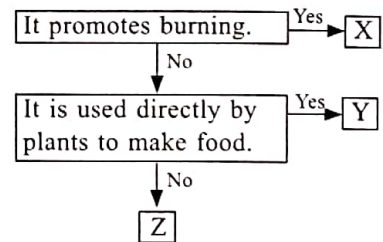
4. Which of the following graphs correctly depicts the body temperature of the given animals with respect to ambient temperature over a 24 hours period?



5. The given options show the bacterial count, oxygen level and the number of green plants and animals in the river near each of four towns A, B, C and D. Which town is situated near an unpolluted river?

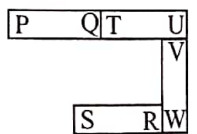
	Bacterial count	Oxygen level	Number of green plants	Number of animals
A.	Low	High	Few	Few
B.	High	Low	Few	Many
C.	High	Low	Few	Few
D.	Low	High	Many	Many

6. Refer to the given flow chart and identify the components X, Y and Z of air.



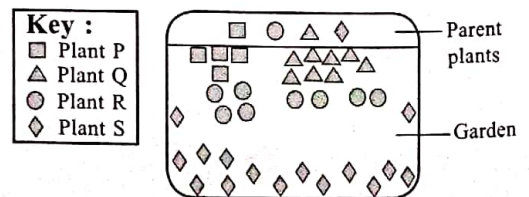
- A. X - Carbon dioxide; Y - Nitrogen; Z - Oxygen
- B. X - Carbon dioxide; Y - Oxygen; Z - Nitrogen
- C. X - Oxygen; Y - Carbon dioxide; Z - Nitrogen
- D. X - Nitrogen; Y - Oxygen; Z - Carbon dioxide

7. Study the arrangement of four magnets shown in the given diagram. Which of the following is a possible arrangement of two of the magnets?



- A.
- B.
- C.
- D.

8. Raman planted four plants P, Q, R and S near the boundary of his garden. The diagram shows the distribution of these plants in the garden area after a certain time period.



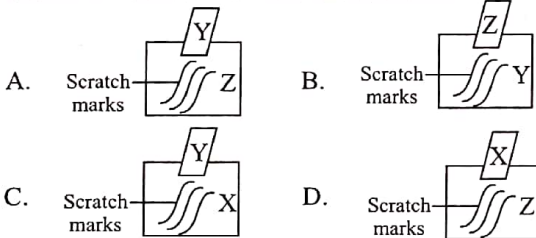
- Which one of the plants is most likely to be *Hiptage*?
- A. Plant P
 - B. Plant Q
 - C. Plant R
 - D. Plant S

9. The given table shows the rank of three different minerals on the scale of hardness.

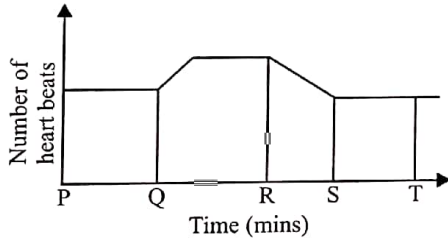
Mineral	Rank of hardness
X	4
Y	2
Z	7

The given options show the scratch marks made on the surface of one mineral by rubbing with another mineral.

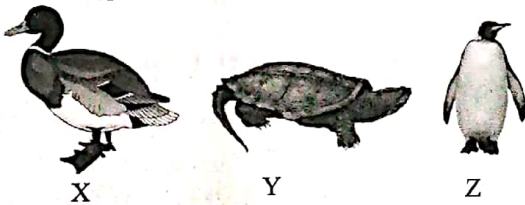
Based on the above data, which of the following results of scratch test will be obtained?



10. Shiva has just completed vigorous exercise. Which part of the graph most likely shows the time when he has just stopped exercising?

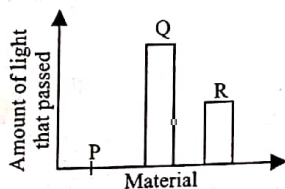


- A. PQ
B. RS
C. QR
D. ST
11. Refer to the given figures X, Y and Z and select the correct option.



- A. They all possess similar respiratory organs.
B. They all possess similar body coverings.
C. They all possess flippers to swim in water.
D. They all possess hollow bones to make the body light.

12. Raj shone torchlight on three objects P, Q and R one at a time and measured the amount of light that passed through each one of them by using light sensors. The given graph shows the result of his experiment.



Which of the following options correctly identifies P, Q and R?

	P	Q	R
A.	Frosted glass	Mirror	Cellophane paper
B.	Wood	Clear glass window	Tracing paper
C.	Plastic sheet	Aluminium foil	Sand paper
D.	Cellophane paper	Tracing paper	Mirror

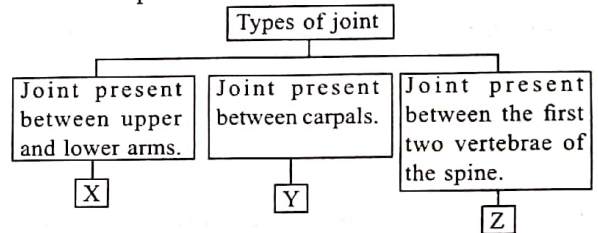
13. Seema grouped plants on the basis of their mode of vegetative reproduction. In one of the groups she placed an incorrect member by mistake. Identify this group and select the correct option.

- A. Potato, Ginger, Onion
B. Sweet potato, Dahlia, Carrot
C. *Bryophyllum*, *Begonia*, Sugarcane
D. *Hibiscus*, *Bougainvillea*, Rose

14. Select the incorrect match.

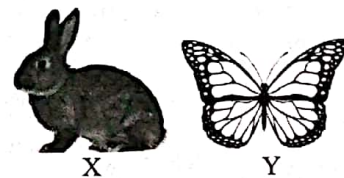
- A. Exosphere - All weather changes take place in this layer.
B. Stratosphere - Jet planes usually fly in this layer.
C. Mesosphere - Most meteoroids entering the Earth's atmosphere slow down and burn up in this layer.
D. Thermosphere - Space shuttles orbit in this layer.

15. Refer to the given classification table and select the correct option.



- A. X could be hinge joint whereas Z could be pivot joint.
B. Y could be ball and socket joint whereas Z could be gliding joint.
C. X could be gliding joint whereas Y could be pivot joint.
D. Y could be pivot joint whereas Z could be gliding joint.

16. Following animals X and Y have been paired based on the manner in which they obtain and consume their food.



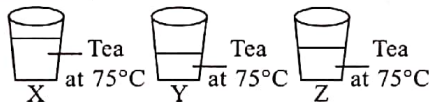
Select the option that correctly pairs animals on the similar basis.

- | X | Y |
|--------------|-------------|
| A. Python | Grasshopper |
| B. Hamster | Bed bug |
| C. Viper | Housefly |
| D. Cassowary | Butterfly |

17. Study the given relationship.
Shale : Slate : Granite
Select the option that correctly satisfies the same relationship.
- Conglomerate : Gneiss : Pumice
 - Marble : Limestone : Obsidian
 - Sandstone : Quartzite : Marble
 - Quartzite : Marble : Conglomerate

18. Select the option which classifies non-communicable and communicable diseases correctly. [Communicable diseases (CD) and Non-communicable diseases (ND)]
- CD : Typhoid, Cholera
ND : Dengue, Measles
 - CD : Typhoid, Jaundice
ND : Rickets, Scurvy
 - CD : Asthma, Dengue
ND : Malaria, Cholera
 - CD : Scurvy, Arthritis
ND : Chickenpox, Tetanus

19. Study the three similar glasses of tea that are placed on the table.



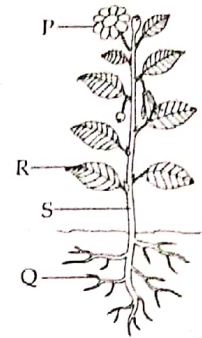
Which of the following statements are true about the glasses of tea X, Y and Z?

- The tea in glasses X, Y and Z have the same amount of heat.
 - The tea in glasses X and Y have more heat than in glass Z.
 - The tea in glass X has more heat than glass Z.
 - The tea in glass Y has more heat than glasses X and Z.
20. Identify X, Y and Z from the given figure and select the correct statement regarding them.



- Z is attached to bones whereas X is not attached to bones
 - Y is voluntary muscle whereas Z is involuntary muscle.
 - X is very strong muscle that works continuously.
 - None of these
21. Select the animal group that possesses similar body covering.
- Crocodile, Ostrich, Newt
 - Elephant, Frog, Rhinoceros
 - Turtle, Tortoise, Snail
 - Porcupine, Hedgehog, Crocodile

22. The given figure shows plant parts labelled as P, Q, R and S. Which of the following options correctly list the plants in which labelled part is edible?



- P – Broccoli, Cauliflower, Lettuce
- Q – Tapioca, Turnip, Onion
- R – Coriander, Spinach, Fenugreek
- S – Potato, Ginger, Sweet potato.

23. Read the given statements regarding the lever and select the correct ones.

- In beam balance, fulcrum is in the middle.
- A nutcracker is an example of third class lever.
- In tongs, the fulcrum and the load are at the two ends.
- See-saw is an example of first class lever.

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

24. Unscramble the letters given in column II to make meaningful terms and match column I with column II to select the correct option.

Column I	Column II
P. Tropical storm with spinning winds	(i) RACERT
Q. Hollow top of the volcano	(ii) UGHORDT
R. Extended period of dry weather	(iii) ELOCYNC
S. Magma erupting from a volcano	(iv) ALAV

- P - (i); Q - (iii); R - (ii); S - (iv)
- P - (iv); Q - (ii); R - (i); S - (iii)
- P - (i); Q - (iii); R - (iv); S - (ii)
- P - (iii); Q - (i); R - (ii); S - (iv)

25. The given diagram shows three gears arranged to work in a mechanical system. If gear R moves in an anticlockwise direction, in which direction would gears P and Q move?



- P-Anticlockwise, Q-Clockwise
- P-Clockwise, Q-Clockwise
- P-Clockwise, Q-Anticlockwise
- P-Anticlockwise, Q-Anticlockwise

26. Study the given relationship.
Soluble impurities : Insoluble impurities :: X : Y
Select the option that correctly identifies separating methods X and Y.

X	Y
A. Evaporation	Distillation
B. Distillation	Filtration
C. Sedimentation	Decantation
D. Filtration	Distillation

27. Study the table given below describing the characteristics of four animals W, X, Y and Z.

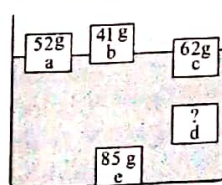
Description	W	X	Y	Z
It has six legs.	✓	✗	✓	✗
It breathes through gills.	✓	✗	✗	✓
It possesses hollow bones.	✗	✓	✗	✓

- Which of the following is likely to be a mosquito?
A. W B. X
C. Y D. Z

28. X changes to Y on condensation. Select the option that correctly represents the arrangement of molecules in X and Y.

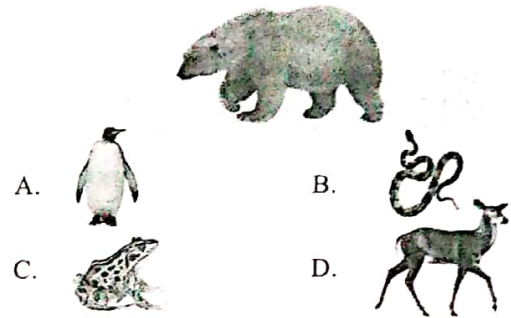
	X	Y
A.		
B.		
C.		
D.		

29. 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. 45 g B. 58 g
C. 74 g D. 90 g

30. Select the animal that has similar body covering as the animal shown here.



31. In India, crops that are grown in winter are called rabi crops. Which of the following are rabi crops?
(i) Radish (ii) Mustard
(iii) Rice (iv) Millet
(v) Cabbage (vi) Watermelon
(vii) Peach (viii) Cauliflower
A. (i), (ii) and (vii) only
B. (iii), (iv), (v) and (vi) only
C. (iv), (vi) and (viii) only
D. (i), (ii), (v) and (viii) only

32. Select the option that correctly represents chemical change (X) and physical change (Y).

X	Y
A. Bending of wire	Ripening of mango
B. Cooking of food	Melting of ice
C. Rusting of iron	Burning of crackers
D. Formation of cloud	Germination of a seed

33. Study the given table.

Characteristic	Material		
	X	Y	Z
Definite volume	✓	✓	✓
Opaque	✗	✓	✗
Definite shape	✗	✓	✓

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

	X	Y	Z
A.	Air	Rubber ball	Mirror
B.	Honey	Mirror	Cardboard
C.	Water	Wooden sheet	Glass
D.	Ink	Steel plate	Mirror

34. Which of the following is not a greenhouse gas?

- A. Carbon dioxide
B. Methane
C. Ozone
D. Sulphur dioxide

35. Which of the following groups of seeds contains only dicot seeds?

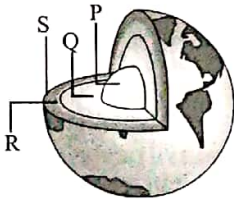
- A. Wheat, Rice, Maize
B. Pea, Maize, Bean
C. Pea, Bean, Gram
D. Maize, Gram, Pea

36. Which of the following belong to the same group to which microbes that cause plague (X) and polio (Y) belong?



- | | | |
|----|---|---|
| | X | Y |
| A. | Q | R |
| B. | P | R |
| C. | Q | P |
| D. | P | S |

37. Observe the given figure.



From which of the following layers does molten magma come out when a volcano erupts?

- | | | | |
|----|---|----|--------------|
| A. | P | B. | Q |
| C. | R | D. | Both Q and S |

38. Renu classified plants into groups as shown in the table shown here. Which of the following is the most appropriate headings for group X and group Y?

X	Y
Fern	Dahlia
Moss	Potato
Pine	Onion

- | | |
|-------------------------|----------------------|
| X | Y |
| A. Aquatic plants | Terrestrial plants |
| B. Heterotrophs | Autotrophs |
| C. Non-flowering plants | Flowering plants |
| D. Parasitic plants | Insectivorous plants |

39. Rini was asked to write some involuntary actions. She has written some voluntary actions also as shown in the list.

(i) Chewing food (ii) Sitting upright on a table
 (iii) Digestion of food (iv) Beating of heart
 (v) Singing a song (vi) Dancing (vii) Breathing
 (viii) Writing a letter

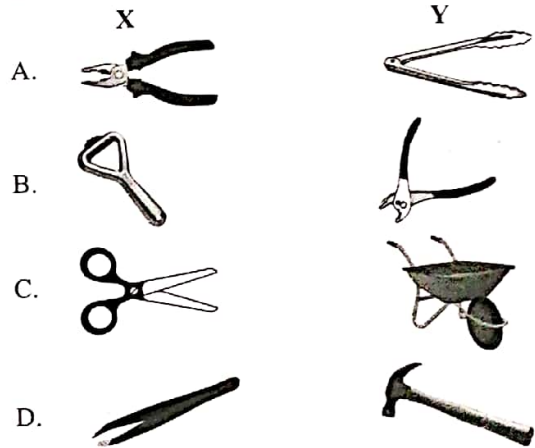
Select the option that contains only involuntary actions.

- A. (i), (iii), (vii) and (viii) only
 B. (ii), (vi) and (vii) only
 C. (iii), (iv) and (vii) only
 D. (ii), (v), (vi) and (vii) only
40. Ruchi categorised animals on the basis of their body coverings. She made three groups and by mistake placed one wrong member in each group. Identify the wrong member of each group and select the correct option.

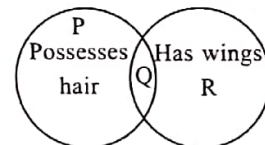
Group I – Snake, Lizard, Crab
 Group II – Sloth, Platypus, Salmon
 Group III – Penguin, Pigeon, Grasshopper

- A. Crab of group I should be interchanged with grasshopper of group III.
 B. Salmon of group II should be replaced with toad.
 C. Platypus of group II should be interchanged with pigeon of group III.
 D. Grasshopper of group III should be replaced with parakeet.

41. Which of the following represents first class lever (X) and second class lever (Y) respectively?



42. Refer to the given Venn diagram and select the correct option.



- A. P could be cold blooded animal whereas R could be warm blooded animal.
 B. P and R may possess endoskeleton of bones.
 C. P breathes through spiracles whereas R breathes through gills.
 D. Q could have hollow bones.

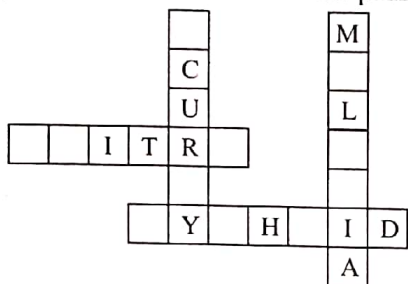
43. Study the given passage.

X, Y and Z are different parts of the brain. X controls muscular activities, Y controls learning ability and memory and Z controls activities such as breathing, heartbeat and blood pressure.

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

- A. X is the upper part of brain that also controls our sense organs.
 B. Y is located below X towards back of the brain.
 C. X is also called brain stem and it works even when we are asleep.
 D. Z connects the brain to spinal cord whereas Y is the largest part of the brain.

44. Solve the given puzzle based on diseases and select the option that is not hidden in this puzzle.



- A. A disease that can spread by biotic agent.
 B. A disease that spreads by contaminated food or water.
 C. A disease that is caused due to the deficiency of energy giving food.
 D. A disease that is caused due to the deficiency of protective food.

45. Swati wanted to study the effect of temperature on the rate of evaporation. For this, she carried out the experiment under four different sets of conditions as shown in the table.

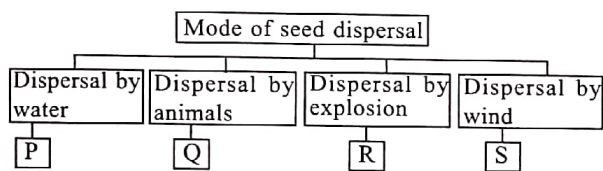
Characteristic	Set W	Set X	Set Y	Set Z
Surface area of the container	80 cm ³	120 cm ³	80 cm ³	120 cm ³
Humidity	80%	90%	90%	90%
Temperature	75°C	120°C	75°C	75°C

Which of the following is best suited to conclude the effect of temperature on the rate of evaporation?

- A. Set W and Set Z
 B. Set X and Set Z
 C. Set Y and Set Z
 D. Set W and Set Y

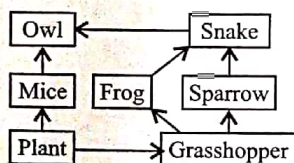
ACHIEVERS SECTION

46. Study the given flow chart.

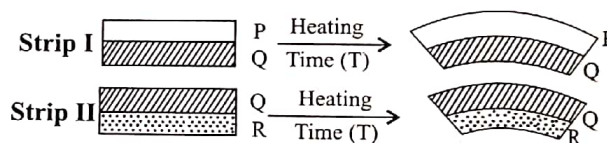


Select the option that correctly identifies P – S.

- | | | | | |
|----|-------------|-----------------|----------|------------|
| | P | Q | R | S |
| A. | Castor | Cotton | Cherry | Lotus |
| B. | Coconut | <i>Xanthium</i> | Pea | Madar |
| C. | Lotus | Dandelion | Mango | Tiger nail |
| D. | Spear grass | Madar | Coconut | Dandelion |
47. Refer to the given food web. If a population of an organism X is introduced in this community who preys on mice and snake then what will not be the likely consequence over time?

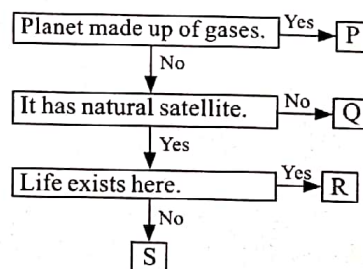


- A. The population of owl will decline with time.
 B. The populations of frog and sparrow will increase with time.
 C. Plant and grasshopper populations will remain unaffected.
 D. Both A and B
48. Ritu took two bimetallic strips, I and II (of equal size, length and breadth) made up of metals P and Q; and Q and R, respectively as shown in the figure. She subjected each bimetallic strip to heating for the same time period. The given diagram shows her experiment.



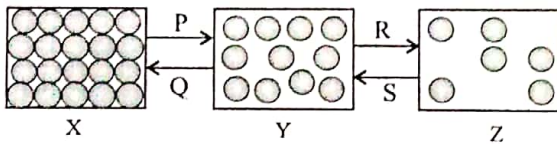
Which of the following can be inferred from the given experiment?

- A. Metal Q expands more as compared to metals P and R on heating for the same time period.
 B. Metal R contracts more as compared to metals P and Q on heating for the same time period.
 C. The order of expansion of these metals when subjected to heating is $R < Q < P$.
 D. Both B and C
49. Study the given flow chart and select the correct option regarding P – S.



- A. P could be the largest planet whereas Q could be the red planet.
 B. Q could be known as morning and evening star whereas R could be the lightest planet.
 C. Q could be the hottest planet whereas P could be the coldest planet.
 D. Q and S may have rings orbiting them whereas R may have no rings orbiting them.


50. The given figure shows three states X, Y and Z in which a matter can exist.




Identify these states and processes (P, Q, R and S) and select the correct option regarding them.

- A. Process S is responsible for drying of wet clothes when put on clothesline.
- B. Process Q is responsible for formation of clouds in the atmosphere.
- C. A naphthalene ball converts from its X state to Y state and *vice versa* by involving processes P and Q.
- D. During processes P and R, heat energy is used to overcome the forces of attraction between the particles.


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PRESENTS



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