



**UNICUS  
OLYMPIADS**

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## **Sample Paper**



**Class 7**

### **Unicus Science Olympiad (USO)**

**Time: 60 minutes**

Pattern and Marking Scheme			
Section	Total Questions	Marks per Question	Total Marks
Classic Section	40	1	40
Scholar Section	10	2	20
Grand Total	50		60

## Classic Section (Each Question is 1 Mark)

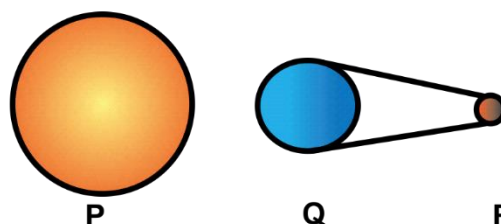
1. Identify the incorrect statement among the following:
  - a. Evaporation is a surface phenomenon and causes cooling.
  - b. Rate of evaporation is directly proportional to temperature.
  - c. Rate of evaporation is inversely proportional to the surface area of the liquid.
  - d. Evaporation causes cooling and depends on humidity.

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2. Female mosquitoes suck blood from humans and other animals. They have a long, sharp pipe-like structure instead of teeth, that is used to pierce the skin and suck blood. Male mosquitoes, on the contrary, feed on plant sap and nectar. Identify the category to which they belong:
  - a. Female mosquito - Herbivorous  
Male mosquito - Omnivorous
  - b. Female mosquito - Herbivorous  
Male mosquito - Herbivorous
  - c. Female mosquito - Sanguivorous  
Male mosquito - Herbivorous
  - d. Female mosquito - Carnivorous  
Male mosquito - Carnivorous

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3. Sarah observed the shadow of a tree at 8.00 a.m., 12.00 noon and 3.00 p.m. Which of the following statements is closest to her observation about the shape and size of the shadow?
  - a. The shape of the shadow of the tree changes but the size remains the same.
  - b. The size of the shadow of the tree changes but the shape remains the same.
  - c. Both the size and shape of the shadow of the tree change.
  - d. Neither the shape nor the size of the shadow changes.

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4. Consider the following statements and choose the correct option:  
**Statement 1:** Asteroids form a belt between the planets Mars and Jupiter where they orbit around the Sun.  
**Statement 2:** Asteroids don't revolve around the Sun like planets.
  - a. Statement 1 is correct but statement 2 is incorrect.
  - b. Statement 1 is incorrect but statement 2 is correct.
  - c. Both the statements are correct.
  - d. Both the statements are incorrect.

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5. The image shows a lunar eclipse. What is the position of the Moon in it?



- a. Q
- c. P

- b. R
- d. P or Q

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6. Select the incorrect match of the following:

- a. Jupiter – It is the fastest-spinning planet
- b. Saturn - Its rings are made of ice, rocks, and dust.
- c. Mercury - It is the hottest planet.
- d. Venus - It is also called as morning or evening star.

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7. A chemical change produces a new substance whereas a physical change does not produce a new substance. Which of the following pair of changes is/are irreversible chemical change(s)?

M: Stretching a rubber band

N: Burning of matchstick

O: Germination of seed

P: Dissolving sugar in water

- a. N and O
- c. M and N

- b. O and P
- d. M and P

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8. There are many ways by which pathogens or germs of communicable diseases are transmitted from one person to another.

What is common amongst the below-given diseases?

<b>CHOLERA, TYPHOID, JAUNDICE</b>
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- a. These diseases are transmitted through air.
- b. These diseases are transmitted through blood and saliva.
- c. These diseases are transmitted through contaminated water.
- d. These diseases are transmitted through insects/animals.

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9. Read the two statements written below and select the correct option related to them:

**Statement 1** - Scissors is a first-class lever where the fulcrum is between the load and the effort. It uses two first-class levers together.

**Statement 2** - Stairs are an example of the inclined plane.

- a. Both the statements are correct
  - b. Both the statements are incorrect
  - c. Statement 1 is correct but statement 2 is incorrect
  - d. Statement 1 is incorrect but statement 2 is correct
-

10. Which of the following is not true about fossil fuels?

- a. We should use fossil fuels carefully as their quantity is limited.
  - b. When fossil fuel is burnt lot of energy is released which is used for various purposes.
  - c. Burning of fossil fuel causes air pollution.
  - d. Solar energy is an example of a fossil fuel.
- 

11. Consider the following adaptations and identify which of them is/are structural adaptations:

- 1. A frog's light-coloured belly makes it harder for a predatory fish to see it against sunlight on the water surface
- 2. A hognose snake pretends as dead to trick the predator.
- 3. The scarlet king snake looks very much like the poisonous coral snake.
- 4. A treehopper on a leaf of twigs resembles a thorn.

- a. Only 1
  - b. Only 2
  - c. Both 2 and 4
  - d. 1, 3 and 4
- 

12. In the following question, an assertion and a reason are given. Choose the correct option:

**Assertion:** The use of jute bags instead of polybags helps in reducing the generation of waste.

**Reason:** Reducing the consumption of materials reduces their wastage thereby reducing their production.

- a. Both assertion and reason are true and reason is the correct explanation of assertion.
  - b. Both assertion and reason are true and reason is not the correct explanation of assertion.
  - c. Assertion is true but reason is false.
  - d. Both assertion and reason are false.
- 

13. In the given question, an assertion and a reason are given. Choose the correct option:

**Assertion:** Water comes out of leaves in the form of water vapour by a process called transpiration.

**Reason:** The transpiration process can be demonstrated by enclosing a leafless twig of a plant in a polythene bag and tying its mouth properly.

- a. Both assertion and reason are true and reason is the correct explanation of assertion.
  - b. Both assertion and reason are true and reason is not the correct explanation of assertion.
  - c. Assertion is true but reason is false.
  - d. Both assertion and reason are false.
- 

14. Which of the following is an incorrect difference between boiling and evaporation?

- a. Boiling takes place at a particular temperature while evaporation can take place at all temperatures.
  - b. Boiling is a fast process while evaporation is a slow process.
  - c. Boiling takes place only at the surface of a liquid whereas evaporation takes place throughout the bulk of a liquid.
  - d. During boiling, movement of bubbles with sound can be observed while during evaporation neither movement nor sound is observed.
-

**15.** Refer to the statements (P to T) describing the steps of rain formation:

P: Condensation occurs

Q: Water evaporates

R: Water droplets form clouds

S: Bigger droplets fall as rain

T: The Sun warms the Earth

Which one of the following options shows the above steps in the correct order?

- a. RSQTP                      b. TQRSP  
c. TQPRS                     d. QPTSR

**16.** Which of the given statements is NOT correct?

- Melting and freezing take place at 100°C and 0°C respectively.
- Steam is hot water vapour.
- When water vapour is cooled, it condenses and becomes a liquid.
- Both evaporation and condensation can take place at a different temperature.

**17. Fill in the blank:**

Aquatic animals are able to survive in water bodies like rivers and oceans during winter when the atmospheric temperature is  $-10^{\circ}\text{C}$ . This is because \_\_\_\_\_.

- a. density of ice is less than water  
b. density of water is minimum at 4°C  
c. ice is a poor conductor of heat  
d. Both a and c

**18. Match the Column I with Column II:**

	Column I		Column II
A.	Ball and socket joint	p.	Does not allow rotation
B.	Pivot joint	q.	Neck and head
C.	Hinge joint	r.	Allows movement in one plane only
D.	Saddle joint	s.	The rounded end of one bone fits into the cavity of other bone

- a. A - s; B - r; C - q; D - p  
b. A - r; B - s; C - q; D - p  
c. A - s; B - q; C - r; D - p  
d. A - s; B - q; C - p; D - r

**19.** A boy kicks a football horizontally from the roof of a building of height 6 m. If the line joining the initial position of the football and the point where it hits the ground makes an angle of  $45^\circ$  with the ground, then calculate the displacement of the football:

- a. 6 m                      b.  $6\sqrt{2}$  m  
c. 12 m                     d. 3 m

20. Some salt is added to water and stirred so that it is completely dissolved.

Which of the following statements explains the changes taking place?

- a. It is a chemical change because a new substance is formed.
  - b. It is a chemical change because there is an exchange of heat.
  - c. It is a physical change because the original substance can be recovered.
  - d. It is a chemical change because there is a change in colour.
- 

21. Peter is eating lunch consisting of chapattis, vegetable curry and orange juice. Which of the following food components is missing from his food?

- |             |                  |
|-------------|------------------|
| a. Proteins | b. Carbohydrates |
| c. Fats     | d. Vitamins      |
- 

22. Choose the correct option and fill in the blanks:

The stem of a plant normally grows away from the Earth, hence is called

\_\_\_\_\_X\_\_\_\_\_ whereas roots of a plant normally grow towards the Earth hence are called \_\_\_\_\_Y\_\_\_\_\_.

- a. X - negatively phototropic, Y - positively phototropic
  - b. X - negatively geotropic, Y - positively geotropic
  - c. X - positively geotropic, Y - negatively geotropic
  - d. X - positively phototropic, Y - negatively phototropic
- 

23. When one end of an iron rod is placed near a compass:

- a. it is always the N-pole of the compass that points towards it
  - b. it is always the S-pole of the compass that points towards it
  - c. any pole of the compass may point towards it
  - d. the compass needle will not be affected by iron rod
- 

24. Which of the following food is obtained from the roots of the plant?

- |                           |                             |
|---------------------------|-----------------------------|
| a. Radish, carrot, turnip | b. Potato, ginger, onion    |
| c. Spinach, lettuce, mint | d. Sugarcane, onion, ginger |
- 

25. Consider the following statement and choose the correct option:

**Statement 1:** We can test the presence of starch using a caustic soda solution.

**Statement 2:** Proteins can be tested using iodine.

- a. Statement 1 is correct and statement 2 is incorrect.
  - b. Statement 1 is incorrect and statement 2 is correct.
  - c. Both the statements are correct.
  - d. Both the statements are incorrect.
-

**26.** Consider the following statements and choose the correct option:

- i. Carbohydrates are digested in the mouth.
- ii. Carbohydrates are bodybuilding foods.
- iii. Fruits and vegetables are rich sources of carbohydrates.

- a. (i) is true but (ii) and (iii) are false
  - b. (iii) is true but (ii) and (iii) are false
  - c. (ii) is true but (i) and (iii) are false
  - d. All are true
- 

**27.** Iron filings can be removed from sand by magnetic separation method. This method can be applied only when:

- a. magnetic substances are mixed up with non-magnetic substances
  - b. magnetic substances are mixed up with magnetic substances
  - c. non-magnetic substances are mixed up with non-magnetic substances
  - d. none of the above
- 

**28.** A dishonest shopkeeper mixes small pebbles into a bag of rice. What method will you use to separate the pebbles from the mixture?

- a. Hand picking
  - b. Sieving
  - c. Winnowing
  - d. Magnetic separation
- 

**29.** In which of the following classes of levers distance moved by load is always greater than the distance moved by the effort?

- a. First class lever
  - b. Second class lever
  - c. Third class lever
  - d. Both first and second class
- 

**30.** Which of the following are not the functions of the stem?

- 1. Conduction of water and minerals from leaves to the roots
- 2. Anchoring the plant firmly into the soil by binding with soil particles
- 3. Keeping the plant upright
- 4. Conduction of the food from roots to the plant parts

- a. 1 and 3 only
  - b. 2 and 3 only
  - c. 1 and 2 only
  - d. 1, 2 and 4
- 

**31.** Refer to the given paragraph and select the correct option:

(i) does not have bones. It has (ii) which helps to extend and shorten the body. It has a large number of (iii) projecting out from the underside of the body which help to get a good grip on the ground.

- a. (i) Snail, (ii) setae, (iii) muscular foot
  - b. (i) Earthworm, (ii) muscles, (iii) setae
  - c. (i) Earthworm, (ii) muscular foot, (iii) scales
  - d. (i) Snake, (ii) muscles, (iii) setae
-

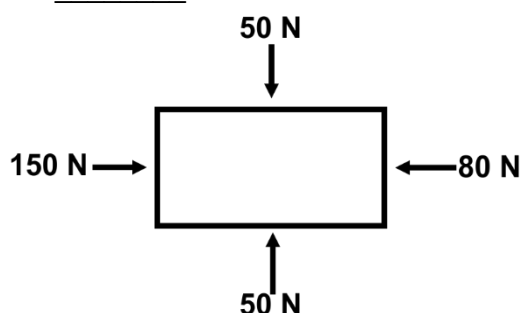
32. In the given question, an assertion and a reason are given. Choose the correct option:

**Assertion:** When you open your mouth wide, you can move your lower jaw away from your head, but you cannot move your upper jaw.

**Reason:** The joint between the upper jaw and the rest of the head is a fixed joint whereas the joint between the lower jaw and the rest of the head is a movable joint.

- Both assertion and reason are true and reason is the correct explanation of assertion.
- Both assertion and reason are true but reason is not the correct explanation of assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false.

33. There are four forces acting on a block as shown in the figure. The magnitude and direction of the net force acting on it is \_\_\_\_\_.



- 150 N, towards right
- 100 N, upwards
- 70 N, towards right
- 70 N, towards left

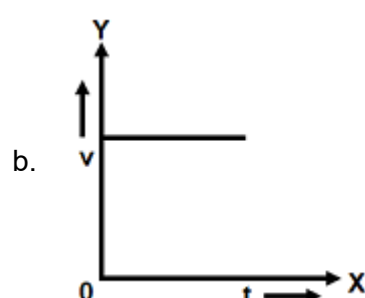
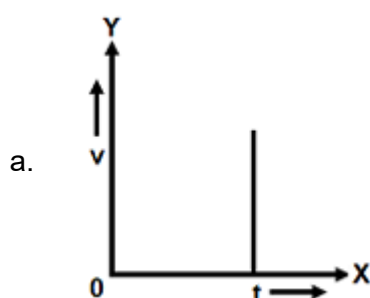
34. In a cricket match, when a bowler swings his hand to throw a ball which of the following joints of his arm is working?

Choose a joint of the same type from the list below:

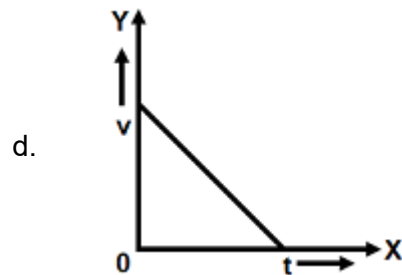
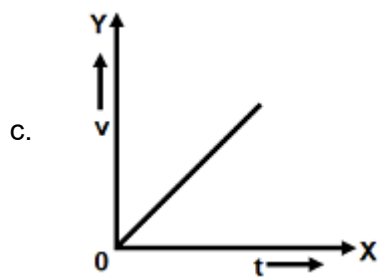
Joints			
A.	Pivot	1.	Knee
B.	Hinge	2.	Skull joints
C.	Gliding	3.	Head and neck
D.	Ball and socket	4.	Hip

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

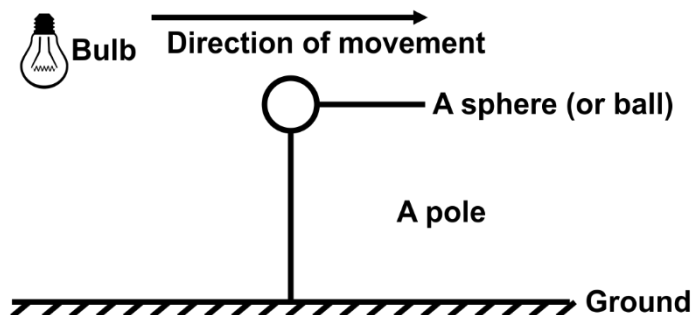
35. Which of the following graphs is impossible with respect to velocity-time graph?







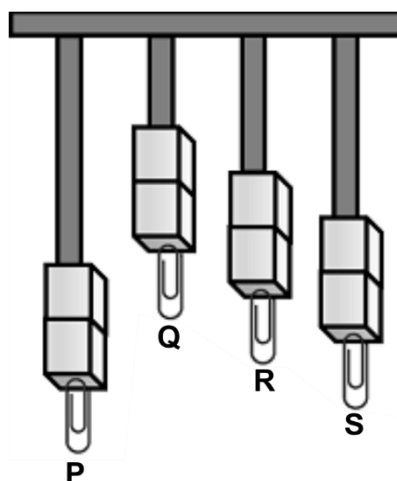
36. In the diagram shown below, the bulb is moved closer to the sphere. How does the shadow of the sphere change?



- The shadow of the sphere will become bigger when the bulb is moved closer to the sphere.
- The shadow of the sphere will become shorter when the bulb is moved closer to the sphere.
- The shadow of the sphere will become bigger when the bulb is moved away to the sphere.
- Shadow of the sphere will disappear when the bulb is moved from its position.

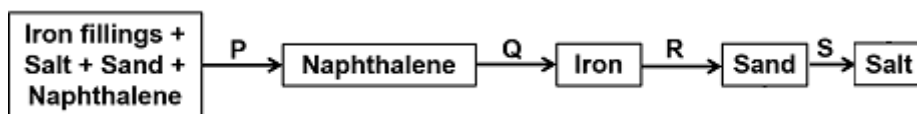
37. The diagram below shows the distance from which four magnets, P, Q, R and S can attract a steel clip from the table.

Arrange the magnets in ascending order of their magnetic strengths:



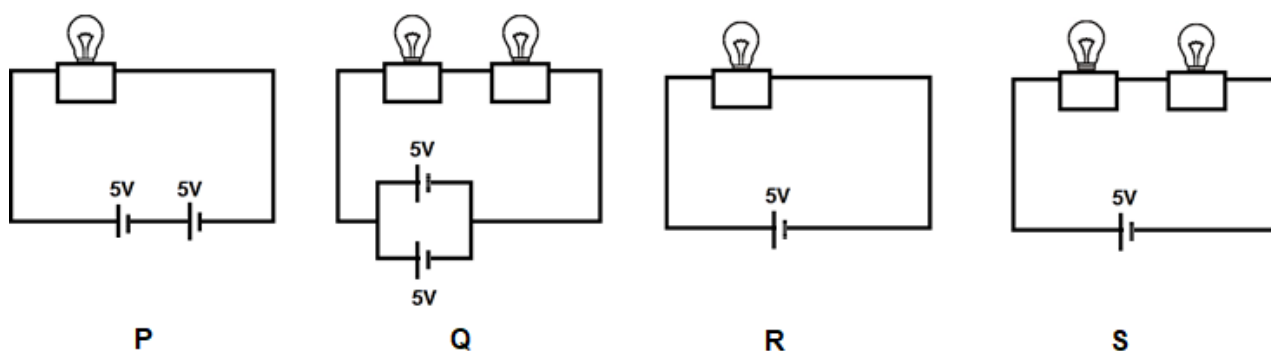
- P, S, R, Q
- Q, R, S, P
- P, S, Q, R
- R, S, P, Q

38. Sarah found a mixture of iron filings, salt, sand and naphthalene and to separate them, she used some separation techniques which are shown by the following flow chart. Identify P, Q, R and S:



- P - Sublimation, Q - Magnetic separation, R - Filtration, S - Evaporation
- P - Magnetic separation, Q - Filtration, R - Sublimation, S - Evaporation
- P - Evaporation, Q - Magnetic separation, R - Filtration, S - Sublimation
- P - Sublimation, Q - Magnetic separation, R - Evaporation, S - Filtration

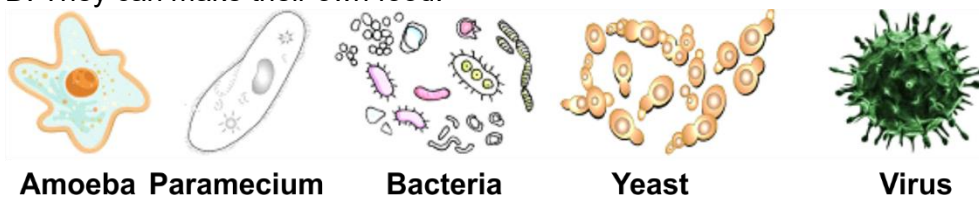
39. In which of the following circuits will the bulb or bulbs glow with the most brightness?



- P
- Q
- R
- S

40. What do these living things have in common?

- These are of same size.
- They can be found in the same place.
- They can only be seen using a microscope.
- They can make their own food.



- A and B
- B and C
- A and C
- A, B, C and D

## Scholar Section (Each Question is 2 Marks)

41. Four students during a classroom discussion made the following statements:

Susan: The revolution of the Earth causes seasons.

David: The only natural satellite of the Earth is Chandrayaan-1.

Harry: The moon shines because its surface reflects light from the sun.

Kate: The Equator is an imaginary line around the Earth that separates it into two halves.

Which of them made the incorrect statement?

- |               |                         |
|---------------|-------------------------|
| a. Susan only | b. David only           |
| c. Harry only | d. Both Susan and David |
- 

42. Consider the following changes:

1. Burning of paper into ash
2. Bursting crackers
3. Burning of petrol in the engine
4. Melting of ice

Which of the above changes cannot reversed?

- |                 |               |
|-----------------|---------------|
| a. 1 only       | b. 2 only     |
| c. 1 and 4 only | d. 1, 2 and 3 |
- 

43. Look at the pictures of animals given below. Find out the similarity between these animals correctly:



- a. They are all carnivores; they eat only animals.
  - b. They are all omnivores as they eat both plants and animals.
  - c. They are all herbivores as they eat only plants.
  - d. They all have feathers on their body.
- 

44. Which of the following leaves have reticulate venation?

1. Mango
2. Wheat
3. Grass
4. Guava
5. Banana

- |            |            |
|------------|------------|
| a. 1 and 4 | b. 2 and 3 |
| c. Only 5  | d. Only 3  |
-

- 45.** James measured the volume of an irregularly shaped body with concepts given by his physics teacher. When he immersed the body in the water contained in a measuring jar, the level of water increased from 480 ml to 2208 ml. Find the length of the edge of the cube whose volume is equal to the volume of the given irregularly shaped body:
- a. 5 m                                      b. 11 cm  
c. 12 cm                                    d. 12 m

- 46.** In the given question, an assertion and a reason are given. Choose the correct option:  
**Assertion:** A boy wearing a coloured contact lens, grey in the left eye and green in the right eye, standing in front of a plane mirror observes the left eye as green and the right eye as grey.  
**Reason:** Lateral inversion makes the left side appear right and the right side appear left.
- Both assertion and reason are true and reason is the correct explanation of assertion.
  - Both assertion and reason are true and reason is not the correct explanation of assertion.
  - Assertion is true but reason is false.
  - Assertion is false but reason is true.

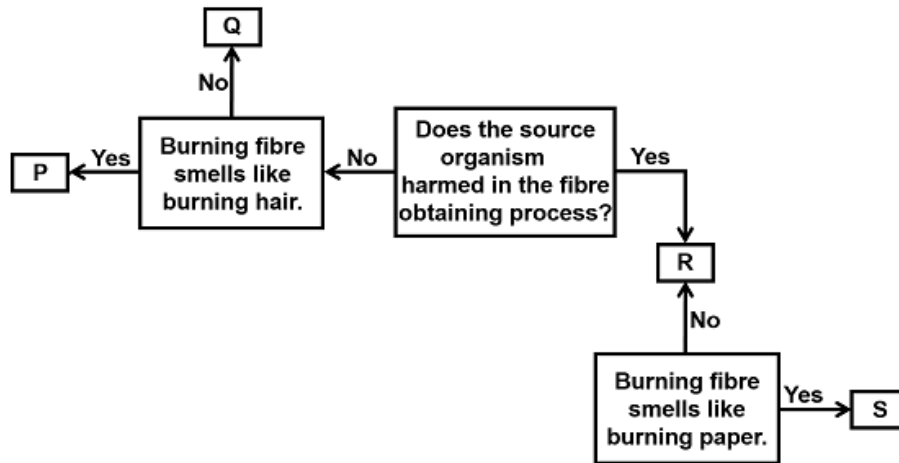
- 47.** James is provided with soil and asked to find out if the given soil contains some magnetic substance or not. He rubbed a magnet in the soil and then pulled out the magnet. The magnet appeared as shown below. The substance sticking to the magnet is:



- a. Iron  
b. Cobalt  
c. Nickel  
d. Any of the above material

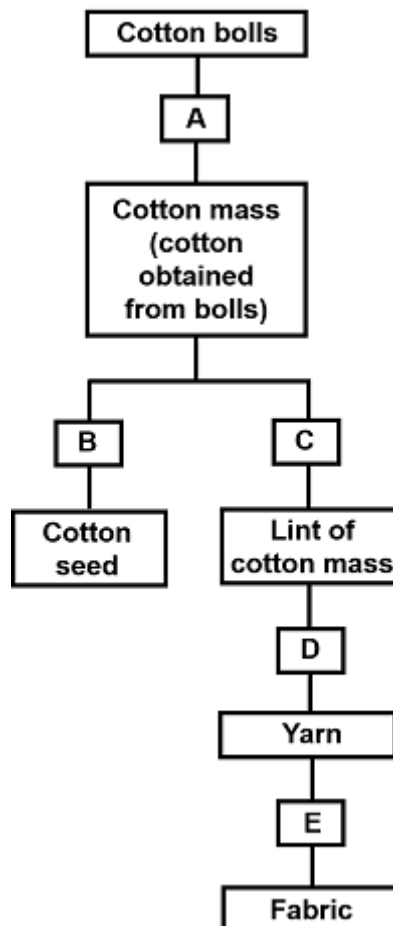
- 48.** A wooden block is tied to a metallic rod of mass 100 g and immersed completely in water. When the displaced water is collected in a measuring jar, the volume of the liquid displaced is found to be 400 ml. If the density of the metallic rod is  $5 \text{ gcm}^{-3}$ , and the mass of the wooden block is 300 g, determine the density of the wooden block:
- a.  $0.79 \text{ gcm}^{-3}$                       b.  $0.45 \text{ gcm}^{-3}$
- c.  $2.9 \text{ gcm}^{-3}$                         d.  $1.9 \text{ gcm}^{-3}$

49. Refer to the given flow chart and select the option that correctly identifies the fibres P, Q, R and S:



- a. P - Wool, Q - Silk  
 b. R - Wool, S - silk  
 c. P - Wool, R - Silk  
 d. Q - Jute, S - Coconut

50. Observe the flow chart given below and mark the part in which the ginning process occurs:



- a. Only B  
 b. B and C  
 c. C and E  
 d. Only D

## Answer Key

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