

2022 - 23



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CLASS

6

QUESTION PAPER SET

C



DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Name: .....

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Contact No.: .....

Total Questions: 50

Time: 1 hr.



SOF NATIONAL SCIENCE  
OLYMPIAD 2022-23

### Guidelines for the Candidate

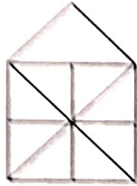
1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Roll No.** and **Mobile Number** clearly on the **OMR Sheet** and do not forget to sign it. We will share your marks / result and other information related to SOF exams on your mobile number.
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 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.
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 the space provided on this page before attempting the paper.

16. ● ○ ○ ○

## LOGICAL REASONING

1. If A stands for '4', B stands for '3', C stands for '8' and D stands for '6', then find the value of 13 A 9 B 4 C 20 D 5.
- A. 5  
B. 6  
C. 7  
D. 8

2. Find the number of squares formed in the given figure.



- A. 8  
B. 6  
C. 7  
D. 5
3. Arrange the given words as they occur in a dictionary and select the correct option.

1. Game
2. Goal
3. Globe
4. Glad

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

4. Select the correct water image of the given word.

**STUDY**

- A. S L U D Y  
B. Z L U D Y  
C. Z T U D Y  
D. Z L U D Y

5. Which of the following figures is exactly embedded in the given figure as one of its parts?



- A.
- C.

- B.
- D.

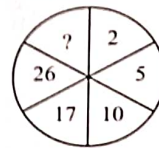
6. In a certain code language, if SUMMER is coded as TTNLFQ, then how will WINTER be coded in the same code language?

- A. XJOUFS  
B. VHMSDQ  
C. XHOSFQ  
D. XHMSDS

7. Arjun is facing towards North. He turns  $180^\circ$  clockwise and then  $135^\circ$  anti-clockwise direction. Which direction is he facing now?

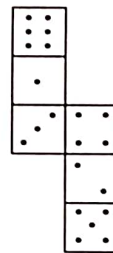
- A. South-West  
B. North-West  
C. North-East  
D. South-East

8. Find the missing number.



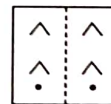
- A. 35  
B. 37  
C. 36  
D. 38

9. How many dots lie opposite to the face having 5 dots, when the given figure is folded to form a cube?



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

10. A square transparent sheet with a design and a dotted line on it is given. Select a figure from the options as to how the pattern would appear when the sheet is folded along the dotted line.



- A.
- C.

- B.
- D.

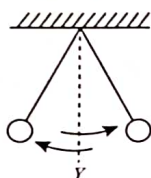
## SCIENCE

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

- I. The direction of magnetic field lines inside the magnet is from south pole to north pole.
- II. Lodestone is an artificial magnet.
- III. Steel pin is not a magnetic material.
- IV. A compass needle always points in the East-West direction.

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

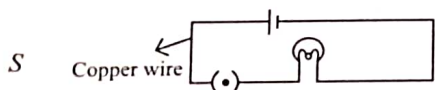
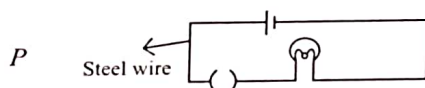
12. A pendulum swings in backward and forward directions passing through *Y*, the middle point of the oscillations as shown in the given figure. When first time the pendulum passes through *Y*, a stopwatch is started.



When twenty-first time the pendulum passes through *Y*, the stopwatch is stopped. The reading is *T*. What is the time period of the pendulum in terms of *T*?

- A.  $T/40$
- B.  $T/21$
- C.  $T/20$
- D.  $T/10$

13. Consider the four circuits *P*, *Q*, *R* and *S* as shown in the given figure. Which one is the closed circuit?



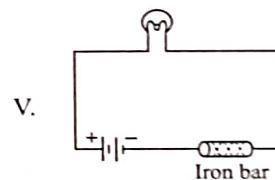
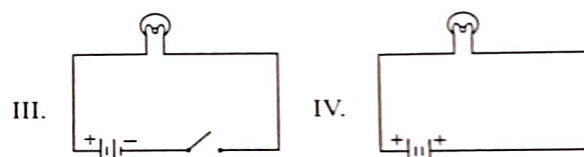
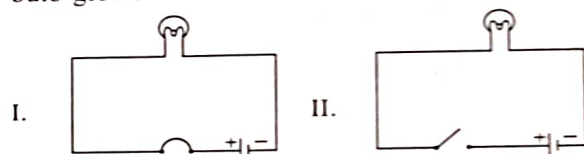
- A. Circuit *P*
- B. Circuit *R*
- C. Circuit *S*
- D. Circuit *Q*

14. Select the correct option to fill the blanks in the given paragraph.

Movement of the Earth around the Sun in a fixed orbit is called (i). The Earth takes approximately (ii) to complete one (i). The (i) of Earth and its (iii) on its axis causes (iv).

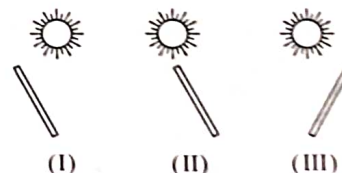
- |    | (i)        | (ii)     | (iii)    | (iv)             |
|----|------------|----------|----------|------------------|
| A. | Rotation   | 24 days  | Spinning | Day and Night    |
| B. | Revolution | 365 days | Tilt     | Day and Night    |
| C. | Rotation   | 24 days  | Spinning | Change in season |
| D. | Revolution | 365 days | Tilt     | Change in season |

15. In which of the following arrangements will the bulb glow?



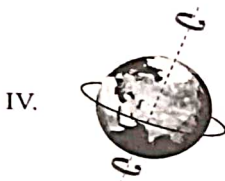
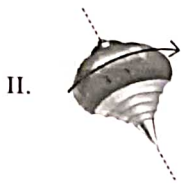
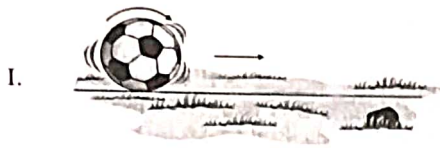
- A. I and III only
- B. I and IV only
- C. I and V only
- D. II, III and V only

16. Three sticks are placed in an open field as shown in the given figure. Which of the following sticks will form the shadows of equal length?



- A. Sticks (I) and (II) only
- B. Sticks (II) and (III) only
- C. Sticks (I) and (III) only
- D. Sticks (I), (II) and (III)

17. Which of the following motions are rotatory as well as translatory?

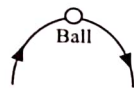


- A. I and III only
- B. I, II and IV only
- C. II and III only
- D. III and IV only

18. Read the following statements and select the correct option.

- I. Only a point source forms a complete umbra.
  - II. An extended source of light forms both umbra and penumbra.
- A. Only I is true
  - B. Only II is true
  - C. Both I and II are true
  - D. Both I and II are false

19. A ball is kicked into the air and it follows the path as shown in the given figure. When the ball is at the highest point, it has



- I. Maximum potential energy
- II. Minimum kinetic energy
- III. Both potential energy and kinetic energy
- IV. Maximum kinetic energy

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

20. Consider the pictorial representation of various categories of levers given in column I and their corresponding names given in column II. Match the column I with column II and select the correct option from the given codes.

Column I	Column II
<p>P. </p>	(i) First class lever
<p>Q. </p>	(ii) Second class lever
<p>R. </p>	(iii) Third class lever

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

21. Which of the following pairs of liquids will be completely miscible with water?

- A. Mustard oil, Coconut oil
- B. Milk, Kerosene
- C. Olive oil, Apple juice
- D. Vinegar, Lemon juice

22. Select the activity that is an example of an irreversible change.

- A. Melting of butter
- B. Making a paper boat
- C. Cooking of food
- D. Stretching of a rubber band

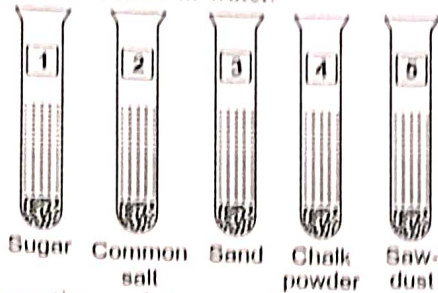
23. Which of the following can be separated by filtration?

- A. Milk and water
- B. Salt and sugar
- C. Sawdust and water
- D. All of these

24. Which of the following processes is involved in the drying of wet clothes?

- A. Sublimation
- B. Melting
- C. Evaporation
- D. Condensation

25. Study the given experimental set-up in which different substances are added in water.



After some time, substances will completely dissolve in test tubes

- A. 1 and 2 only  
 B. 2, 3 and 4 only  
 C. 3, 4 and 5 only  
 D. 4 and 5 only
26. Read the given statements and select the correct option.  
**Statement 1 :** Wooden block, rubber and plastic float on water.  
**Statement 2 :** Materials which are less denser than water, float on water.
- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1.  
 B. Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of statement 1.  
 C. Statement 1 is true but statement 2 is false.  
 D. Both statements 1 and statement 2 are false.
27. Match column I with column II and select the correct option.

Column I (Mixture)	Column II (Method of separation)
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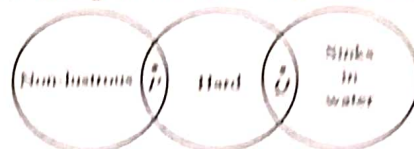
- |                          |                          |
|--------------------------|--------------------------|
| P. Coconut oil and water | (i) Churning             |
| Q. Butter and milk       | (ii) Magnetic separation |
| R. Grains and stalks     | (iii) Separating funnel  |
| S. Iron nails and sugar  | (iv) Threshing           |
- A. P-(ii), Q-(iii), R-(iv), S-(i)  
 B. P-(iii), Q-(i), R-(iv), S-(ii)  
 C. P-(i), Q-(iii), R-(ii), S-(iv)  
 D. P-(iv), Q-(i), R-(iii), S-(ii)

28. Riya poured honey from a long cylindrical tumbler to a round bowl. She notices that now, the honey takes the shape of the round bowl, although its volume remains the same.

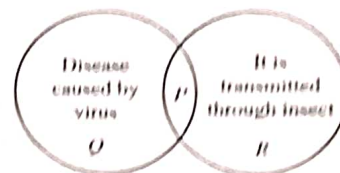


The experiment that Riya has performed indicates that

- A. Liquids have no definite volume  
 B. Liquids have no colour  
 C. Liquids have no definite shape, but definite volume  
 D. Liquids have neither definite shape, nor definite volume.
29. Identify *P* and *Q* in the following Venn diagram.



- A. *Q* could be sponge.  
 B. *P* could be a wooden block.  
 C. *Q* could be a metallic sheet.  
 D. Both B and C
30. Refer to the given Venn diagram and select the correct option.



- A. *P* could be typhoid whereas *Q* could be polio.  
 B. *Q* could be chicken pox whereas *R* could be plague.  
 C. *P* could be malaria whereas *R* could be pneumonia.  
 D. *Q* could be tuberculosis whereas *R* could be common cold.
31. Select the odd one out on basis of rabi and kharif crops.
- A. Mustard  
 B. Gram  
 C. Rice  
 D. Wheat
32. Which of the following is/are not an effect of flood?

- (i) Soil erosion  
 (ii) Shortage of food  
 (iii) Outbreak of water borne diseases  
 (iv) Scarcity of clean drinking water  
 (v) Forest fire
- A. (i), (iii) and (v) only  
 B. (ii) and (iii) only  
 C. (iii), (iv) and (v) only  
 D. (v) only

33. Identify planet *P* from the given sequence of planets of the Solar System with respect to their distance from the Sun and select the correct statement regarding it.

Venus, Earth, *P*, Jupiter

- A. It has 63 Moons.  
 B. It takes 687 days to revolve around the Sun.  
 C. It has faint rings around it.  
 D. It has blue colour due to the presence of methane gas in its atmosphere.

34. Abhiraj was asked by his teacher to make groups of animals on the basis of their feeding habits. He made the following groups, but with some errors. Select the option in which the error is encircled correctly.

- A. Group I : Sparrow, Crow, Giraffe, Hen  
 B. Group II : Tiger, Lizard, Frog, Bear  
 C. Group III : Deer, Elephant, Crocodile, Zebra  
 D. Group IV : Lion, Hippopotamus, Snake, Eagle

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

Column I (Nutrient)	Column II (Source)
P. Iron	(i) Green leafy vegetables
Q. Vitamin C	(ii) Lemon
R. Iodine	(iii) Almond
S. Vitamin E	(iv) Salt
A. P-(iv), Q-(ii), R-(i), S-(iii)	
B. P-(i), Q-(ii), R-(iii), S-(iv)	
C. P-(i), Q-(ii), R-(iv), S-(iii)	
D. P-(iv), Q-(iii), R-(ii), S-(i)	

36. Jantar Mantar is not located in

- A. Delhi  
 B. Bhopal  
 C. Varanasi  
 D. Ujjain.

37. Identify the agricultural process shown in the given figure and select the correct statement regarding it.



- A. In this process, grains are separated from the stalks.

- B. In this process, grains are separated from the chaff.  
 C. This process is done to increase the fertility of the soil.  
 D. In this process, the crop is dried so that it can be stored for a longer period of time.

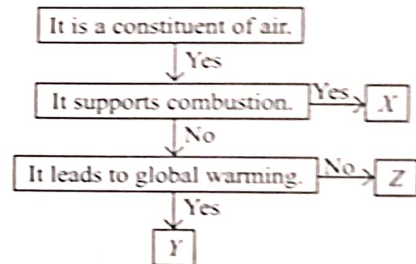
38. Which among the following fibres gives the odour of celery on burning?

- A. Cotton  
 B. Wool  
 C. Nylon  
 D. Flax

39. Seeds of which of the following plants is dispersed by wind?

- A. Dandelion  
 B. Lotus  
 C. Balsam  
 D. Pea

40. Refer to the given flow chart.



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

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

41. Study the given table.

Vitamin	Source	Deficiency
B <sub>3</sub>	(i)	Pellagra
(ii)	Carrot	Night blindness
D	Sunlight	(iii)
C	Amla	(iv)

Select the correct option for (i), (ii), (iii) and (iv).

- |    | (i)          | (ii) | (iii)   | (iv)    |
|----|--------------|------|---------|---------|
| A. | Milk         | A    | Scurvy  | Rickets |
| B. | Milk         | E    | Rickets | Scurvy  |
| C. | Whole grains | A    | Rickets | Scurvy  |
| D. | Whole grains | A    | Scurvy  | Rickets |

42. Read the following statements.
- Ionosphere is not a separate layer as it is present in the troposphere only.
  - Density of air decreases with increasing altitude.
  - Air is an element that surrounds the Earth and makes it hospitable for living organisms.
  - Carbon dioxide traps the heat radiated from the Earth and helps to keep the Earth warm.
- Which of the given statements are correct?
- (i) and (ii) only
  - (ii) and (iv) only
  - (i) and (iii) only
  - (iii) and (iv) only

43. Select the incorrect match regarding birds.
- Streamlined body - Reduces resistance of air
  - Feathers - Maintain the temperature of the body
  - Hollow bones - Make the body light weight
  - Hindlimb - Modified as wings for flight

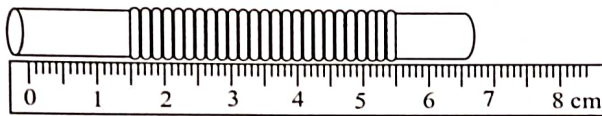
44. Which of the following statements regarding water is incorrect?
- It transports nutrients throughout the body.
  - It provides energy and forms 50% of our blood.
  - It helps to regulate our body temperature through sweating.
  - It helps our body to absorb nutrients from food.

45. Read the given statement.  
In flowers, after fertilisation, the ovary swells up and changes into X and ovules change into Y.  
Select the option that correctly identifies X and Y.

	X	Y
A.	Fruit	Carpels
B.	Petal	Seeds
C.	Seed	Fruits
D.	Fruit	Seeds

### ACHIEVERS SECTION

46. A wire is wound over a rod and placed over a scale as shown in the given figure. One end of the wire is at 5.5 cm and the other end is at 1.5 cm. Radius of the given wire is \_\_\_\_\_.



- 1.45 cm
  - 0.08 cm
  - 0.79 cm
  - 0.34 cm
47. Study the given flow chart and fill in the blanks by selecting an appropriate option.
- ```

    graph TD
      A["Sand, Pebbles, Water, Salt"] -- (i) --> B["Sand, Pebbles"]
      A -- (i) --> C["Water + Salt"]
      B -- (ii) --> D["Sand"]
      B -- (ii) --> E["Pebbles"]
      C -- (iii) --> F["Salt"]
  
```
- Evaporation    Sieving    Condensation
  - Filtration    Sieving    Evaporation
  - Handpicking    Winnowing    Crystallisation
  - Filtration    Handpicking    Condensation
48. Read the given statements and select the option that correctly identifies them as true (T) and false (F) ones.
- Calcium, magnesium and sodium are trace minerals required by our body.
  - Potassium helps in maintaining body's water balance.
  - Deficiency of vitamin B<sub>12</sub> causes anaemia.
  - Vitamin C is a fat soluble vitamin whereas vitamin D is water soluble.
- F    T    T    F
  - F    F    T    T
  - T    F    T    F
  - T    T    T    F
49. Refer to the given flow chart and select the correct option.
- ```

    graph TD
      A["It is a type of joint."] -- Yes --> B["It is present in the ankle."]
      A -- No --> C["It is present between the first two vertebrae of the spine."]
      B -- Yes --> P["P"]
      B -- No --> C
      C -- Yes --> Q["Q"]
      C -- No --> D["It is present in knees."]
      D -- Yes --> R["R"]
  
```
- In P type of joint, bones slide over each other.
  - Q type of joint allows head to turn sideways.
  - R type of joint allows movement in one plane only.
  - All of these

50. Refer to the given statements and select the correct option regarding *W*, *X*, *Y* and *Z*.

*W* : Fibre obtained from fruit of the plant.

*X* : Fibre obtained from stem of the plant.

*Y* : Fibre obtained from animal by killing.

*Z* : Fibre obtained from animal without killing.

A. *W* could be cotton whereas *X* could be linen.

B. *X* could be cotton whereas *Y* could be wool.

C. *Y* could be wool whereas *Z* could be silk.

D. *X* could be jute whereas *Z* could be silk.

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