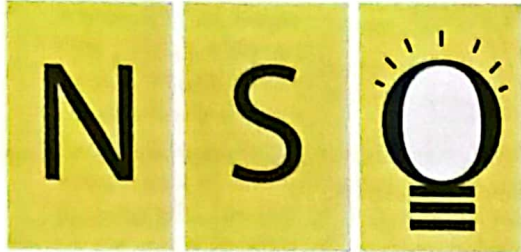




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**SOF NATIONAL SCIENCE
OLYMPIAD 2024-25**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

CLASS **8**

SET-B

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, 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: If a mixture can be separated by magnetic separation, one of the constituents must be
A. Ferrous B. Non-ferrous C. Precious D. Non-metallic.
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 before attempting the paper.
10. **Participate in SOF-Techfest IIT Bombay Innovation Challenge. Open for class 8, 9 & 10. For details and to participate, please turn to last page.**

16. ● (A) (B) (C) (D)

Name:.....

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



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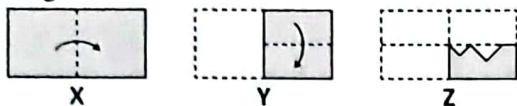
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Assessments

8
Olympiads

LOGICAL REASONING

1. How many such pairs of letters are there in the word **BRILLIANCE** each of which has as many letters between them in the word as in the English alphabets?
- A. One B. Two
C. Three D. More than three

2. Three figures X, Y and Z showing a sequence of folding of a piece of paper are given. Fig. Z shows the manner in which the folded paper has been cut. Select a figure from the options which represents the unfolded form of Fig. Z.



- A. B.
C. D.

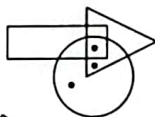
3. What will be the angle made by the hour hand in 480 seconds?

- A. 4° B. 2.5°
C. 3.5° D. None of these

4. Arun travels 40 km towards South, then he turns right and travels 30 km. Then he turns right again and travels 20 km. Then he travels 50 km after taking a final right turn. In which direction and how far is he now from his initial position?

- A. North-East, $20\sqrt{2}$ km B. South-East, $10\sqrt{2}$ km
C. South-West, $10\sqrt{2}$ km D. South-East, $20\sqrt{2}$ km

5. Select a figure from the options which does not satisfy the same conditions of placement of the dots as in the given figure.



- A. B.
C. D.

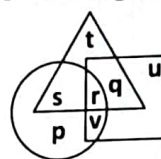
6. Select the odd one out.

- A. R B. M C. Q D. W

7. Select a figure from the options in which the given figure is exactly embedded as one of its parts.



8. Study the given Venn diagram carefully and answer the following question.

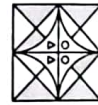
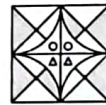
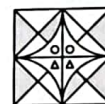


- $\triangle \rightarrow$ Women
 $\square \rightarrow$ Working People
 $\circ \rightarrow$ Married People

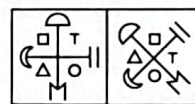
Which of the following letters represents unmarried working men?

- A. s B. v C. p D. u

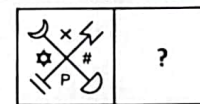
9. Select the correct water image of the given figure.



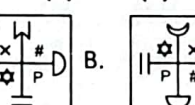
10. There is a certain relationship between figures (1) and (2). Establish the similar relationship between figures (3) and (4) by selecting a suitable figure from the options which will replace the (?) in figure (4).



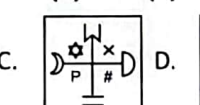
(1)



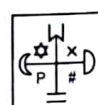
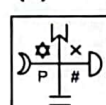
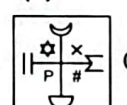
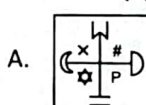
(2)



(3)



(4)



SCIENCE

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

Statement 1 : A moving body covering displacement directly proportional to the square of time has constant acceleration.

Statement 2 : A body moving with uniform velocity will have zero acceleration.

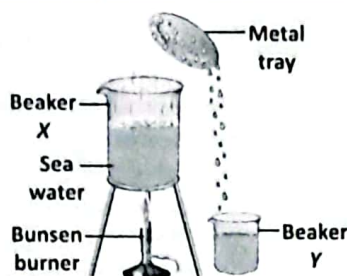
- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.

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

12. A person looks at his face in a mirror kept 20 cm away and he finds that his image is erect and magnified. If he holds the mirror 100 cm away, the characteristics of his image will be represented by which of the following statements?

- A. He sees a magnified and erect image.
 B. He sees a diminished and inverted image.
 C. He cannot see the image because reflected rays falling on his eyes are converging.
 D. He sees a magnified and inverted image.

13. Chirag takes a beaker X filled with water and heats it. A metal tray is placed over beaker X and another beaker Y is positioned below the metal tray as shown in the given figure. After certain



duration, some water is collected in the beaker Y. Which one of the following statements correctly explains why the rate of formation of water droplets on the metal tray decreases over the time?

- A. As the heating continues, beaker Y loses heat and becomes cooler causing the rate of condensation to decrease.
 B. As the heating continues, beaker Y gains heat and becomes hotter, causing the rate of condensation to decrease.
 C. As the heating continues, the metal tray loses heat and becomes cooler, causing the rate of condensation to decrease.
 D. As the heating continues, the metal tray gains heat and becomes hotter, causing the rate of condensation to decrease.

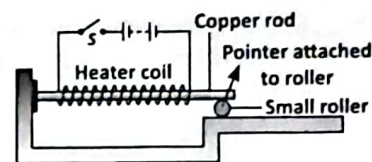
14. Match column I with column II and select the correct option from the given codes.

Column I (Reading on Richter scale)	Column II (Effect of Earthquake)
P. 6 to 6.9	(i) Not felt but recorded
Q. 4 to 5.9	(ii) Can be destructive in small area
R. 0 to 3	(iii) Total damage
S. 8 above	(iv) Often felt but less damage
A. P-(ii), Q-(iv), R-(i), S-(iii)	
B. P-(iii), Q-(ii), R-(i), S-(iv)	
C. P-(i), Q-(ii), R-(iii), S-(iv)	
D. P-(ii), Q-(iv), R-(iii), S-(i)	

15. Which of the following statements are correct about human eye?

- (i) The diameter of the eye ball is about 1.2 cm.
 (ii) Iris is a dark muscular diaphragm that controls the size of the pupil.
 (iii) Most of the refraction of the light rays entering the eye occurs at the outer surface of cornea.
 (iv) While focussing on the objects at different distances, the distance between the crystalline lens and the retina is adjusted by ciliary muscles.
- A. (ii) and (iii) only B. (ii) and (iv) only
 C. (i) and (iii) only D. (i), (ii), (iii) and (iv)

16. Riya sets up an apparatus to observe the expansion of copper as shown in the given figure.



After the switch is closed, which one of the following options correctly represents the movement of the pointer and state of magnetisation of the rod?

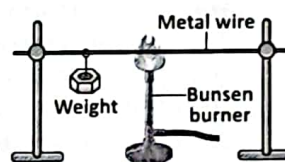
Movement of top of the pointer	Magnetisation state of the rod
A. To the right	Magnetised
B. To the right	Demagnetised
C. To the left	Magnetised
D. To the left	Demagnetised

17. A man sharpens his knife as shown in the given figure. Which of the following properties of friction are in use?



- (i) Friction helps us to hold objects.
 (ii) Friction acts in the opposite direction of motion.
 (iii) Friction causes the surfaces in contact to wear away.
 (iv) Friction produces heat energy.
- A. (i) and (ii) only B. (i), (iii) and (iv) only
 C. (iii) and (iv) only D. (i), (ii), (iii) and (iv)

18. Vaishnavi sets up an experiment as shown in the given figure.

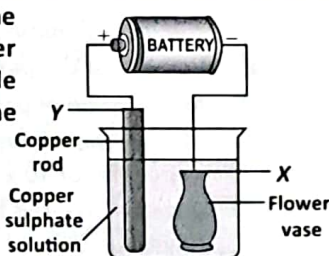


Read the given statements and identify them as true (T) and false (F) ones.

- (i) On heating for about 10 minutes, the suspended weight starts to increase.
 (ii) The metal wire gets contracted if heating continues for another 10 minutes.
 (iii) The suspended weight shifts towards right when the metal wire is heated.
 (iv) If the metal wire is replaced with the glass rod, the rod will expand on heating.

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

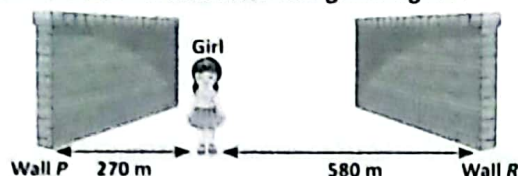
19. The given figure shows the electroplating of copper over a flower vase made of iron. It is done by the process of electrolysis. Now, select the option that correctly fills in the given blanks in the following statement.



During electrolysis, positively charged (i) ions move towards flower vase and negatively charged (ii) ions move towards copper rod.

- A. (i)-Sulphate, (ii)-Copper B. (i)-Copper, (ii)-Sulphide
 C. (i)-Copper, (ii)-Sulphate D. (i)-Sulphate, (ii)-Sulphide

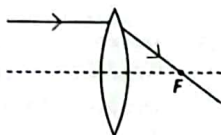
20. A girl standing between two vertical walls fires a pistol. She is 580 m away from wall R and 270 m away from another wall P as shown in the given figure.



If the speed of sound is 330 m/s, what is the maximum number of echoes that the girl can hear in 5 seconds, given that each echo is distinguishable?

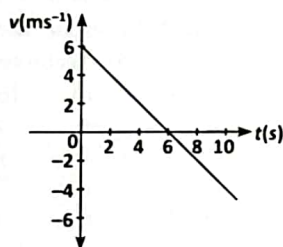
- A. 1 B. 2 C. 3 D. 4
21. Which of the following statements are incorrect?
- (i) Sound travels faster in water than in air.
 - (ii) A sound note of wavelength 2 cm in air cannot be heard by a person.
 - (iii) As compared to light, a sound produced on the Mars takes 10^4 times more time to reach the Earth.
 - (iv) To increase the pitch of sound from a violin string, the length of stretched string should be decreased.
- A. (i) and (iv) only B. (ii) and (iii) only
C. (iii) and (iv) only D. (i) and (ii) only

22. A ray of light is incident on a convex lens, parallel to its principal axis. The emergent ray passes through the principal focus F as shown in the given figure.



Select the correct statement regarding this.

- A. The ray bends downward only once inside the lens.
B. The ray bends downward at the first surface and upward at the second surface of the lens.
C. The ray bends downward at each surface.
D. The ray bends upward at the first surface and downward at the second surface of the lens.
23. A particle is moving along a straight line. Its velocity (v) - time (t) graph is depicted in the given figure.



- | Column I | Column II |
|---|------------------|
| (p) Velocity of the particle at 6 s | (i) 1 SI unit |
| (q) Acceleration of particle at 2 s | (ii) 10 SI unit |
| (r) Displacement of the particle at the end of 10 s | (iii) 26 SI unit |
| (s) Distance covered by the particle in 10 s | (iv) 0 SI unit |
- A. (p)-(iv), (q)-(iii), (r)-(ii), (s)-(i)
B. (p)-(i), (q)-(ii), (r)-(iv), (s)-(iii)
C. (p)-(iv), (q)-(i), (r)-(ii), (s)-(iii)
D. (p)-(i), (q)-(iv), (r)-(iii), (s)-(ii)

24. A ball is held on a piece of paper on a table. The paper is pulled horizontally and quickly towards left as

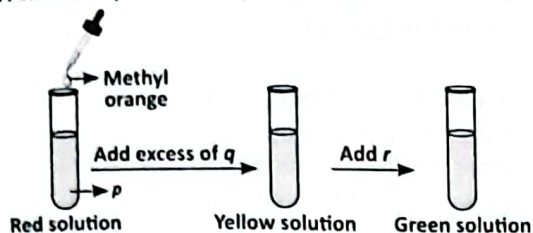
shown in the given figure. Which one of the following statements is correct about the motion of the ball with respect to its initial position?



- A. The ball moves regardless, the presence or absence of friction between the ball and the paper.
B. The ball moves to the left and starts rolling in the direction of applied force if there is friction between the paper and the ball.
C. The ball moves rightwards, that is in the opposite direction in which paper is pulled.
D. The ball remains stationary regardless, the presence or absence of friction between the ball and the paper.
25. A ray of light is incident at an angle of 30° , 45° and 60° on a boundary separating air and mediums P, Q and R respectively. The angle of refraction in these cases are 45° , 60° and 30° respectively. Which of the following statements is/are incorrect about these mediums?
- (i) The refractive index of medium Q is greater than that of medium P.
 - (ii) The refractive index of medium Q is greatest among all the three media.
 - (iii) The refracted ray bends towards normal while going from air to medium P and moves away from normal while going from air to medium R.
- A. (ii) only B. (ii) and (iii) only
C. (i) and (iii) only D. (i), (ii) and (iii)
26. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|---|----------------------------------|
| (P) Charring of sugar | (i) Double-displacement reaction |
| (Q) Reaction of iron chloride with ammonium hydroxide | (ii) Synthesis reaction |
| (R) Burning of magnesium ribbon | (iii) Decomposition reaction |
| (S) Reaction of zinc with copper sulphate | (iv) Displacement reaction |
- A. P - (ii), Q - (iii), R - (iv), S - (i)
B. P - (iv), Q - (i), R - (iii), S - (ii)
C. P - (iii), Q - (i), R - (ii), S - (iv)
D. P - (iv), Q - (ii), R - (i), S - (iii)
27. Read the given statements and select the correct option.
- Statement 1 : The chemicals that are obtained from petrol are called petrochemicals.
Statement 2 : Petrol is used as a fuel in home and industry in the form of liquefied petroleum gas.
- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.

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

28. Kanika performed the following experiment by taking few solutions and methyl orange indicator. Identify p , q and r in the experiment by selecting the correct option.

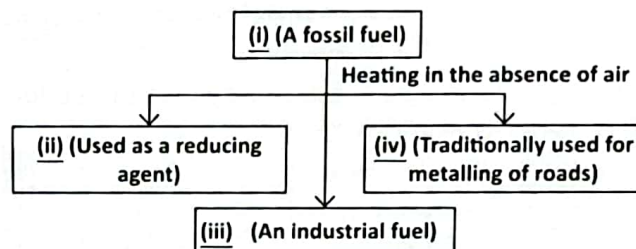


- A. p - Acid, q - Base, r - China rose
 B. p - Base, q - Acid, r - Phenolphthalein
 C. p - Base, q - Acid, r - Red cabbage
 D. p - Acid, q - Base, r - Turmeric
29. Read the given statements and select the option which correctly fills the blanks in these statements.
- I. Carbon particles of wax burn completely to form water vapours and carbon dioxide in the (i) zone of the candle flame.
- II. Biogas is a mixture of (ii) and carbon dioxide while producer gas is a mixture of (iii) and carbon monoxide.
- III. The calorific value of CNG is (iv) than that of kerosene while the calorific value of wood is (v) than that of kerosene.
- A. (i) - Outermost, (ii) - Methane, (iii) - Nitrogen, (iv) - Greater, (v) - Lesser
 B. (i) - Middle, (ii) - Nitrogen, (iii) - Butane, (iv) - Greater, (v) - Lesser
 C. (i) - Outermost, (ii) - Methane, (iii) - Nitrogen, (iv) - Lesser, (v) - Greater
 D. (i) - Innermost, (ii) - Methane, (iii) - Nitrogen, (iv) - Lesser, (v) - Greater
30. Read the following statements and select the option that correctly identifies them as true (T) and false (F) ones.
- (i) The crude oil pumped out from a well is black liquid, hence it is called black gold.
 (ii) Petroleum contains different fractions which have different boiling points.
 (iii) Petroleum is refined in a fractionating tower.
 (iv) During refining of petroleum, the fraction with lowest boiling point condenses at the bottom of the fractionating tower.
- | | (i) | (ii) | (iii) | (iv) |
|----|-----|------|-------|------|
| A. | T | T | F | T |
| B. | F | F | T | F |
| C. | F | T | T | F |
| D. | T | T | T | F |
31. The pH values of a few substances are listed as :
 P - 8.6, Q - 9.8, R - 13.2, S - 2.5, T - 5.6

Based on the given data, select the correct statement(s) from the following.

- (i) Substances Q and R are acidic in nature and substance R is more acidic than substance Q .
 (ii) Substances S and T are basic in nature and substance S is more basic than substance T .
 (iii) Substances P , Q and R are basic in nature while substances S and T are acidic in nature.
 (iv) Substance T changes blue litmus red while substance P changes red litmus blue.
- A. (i) and (ii) only B. (iii) and (iv) only
 C. (ii) and (iv) only D. (i) only

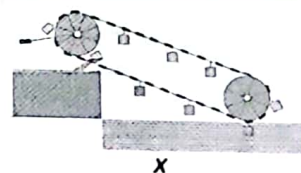
32. Study the given classification chart and identify (i), (ii), (iii) and (iv).



	(i)	(ii)	(iii)	(iv)
A.	Crude oil	Diesel	Petrol	Kerosene
B.	Coke	Coal	Coal gas	Charcoal
C.	Coal	Coke	Coal gas	Coal tar
D.	Coke	Wood	Lampblack	Gas carbon charcoal

33. Read the following statements carefully.
- (i) Burning of LPG is an example of spontaneous combustion while burning of fire crackers is an example of slow combustion.
 (ii) Carbon dioxide is considered to be the best extinguisher for fires caused by short-circuiting in electrical equipment or fire caused by burning of inflammable liquids.
 (iii) The head of the safety match contains a mixture of potassium chloride, antimony trisulphide and a little red phosphorus.
 (iv) In the luminous zone of the candle flame, the wax vapours do not burn completely due to adequate supply of oxygen.
- The correct statement(s) is/are
- A. (i), (ii) and (iv) only B. (ii) only
 C. (ii) and (iii) only D. (iii) only

34. Identify the method of irrigation shown in the given figure X and select the correct statement regarding it.



- A. It is based on pumps.
 B. This method of microirrigation is used to deliver water directly at the base of each plant.
 C. It is a modern method of irrigation.
 D. None of these

35. Refer to the given characteristics of organisms P and Q and select the option that correctly identifies them.

P : It is a multicellular, saprophytic organism which can be used to make antibiotics.

Q : It is a unicellular organism that causes pneumonia.

- | P | Q |
|-------------------------|------------------------|
| A. <i>Paramecium</i> | Bacteriophage |
| B. <i>Lactobacillus</i> | <i>Vibrio cholerae</i> |
| C. <i>Penicillium</i> | <i>Streptococcus</i> |
| D. <i>Giardia</i> | <i>Paramecium</i> |

36. Select the incorrect match.

- | | |
|-----------------------|--|
| A. Rennin | – Breaks down proteins into peptones |
| B. Bile | – Activates lipase |
| C. Pancreatic amylase | – Changes starch into maltose |
| D. Lipase | – Changes fats into fatty acids and glycerol |

37. Refer to the given table and select the option that correctly identifies P and Q.

National Park	Famous for
Kaziranga National Park	P
Q	Royal Bengal Tiger

- | P | Q |
|--------------------------|---------------------------|
| A. Asiatic lion | Gir National Park |
| B. Hangul | Jim Corbett National Park |
| C. Chinkara | Kanha National Park |
| D. One-horned rhinoceros | Sundarbans National Park |

38. Each of the following groups (P-R) contains an odd member on the basis of internal or external fertilisation.

Group P : Pigeon, Snake, Rohu, Human being

Group Q : Crocodile, Bat, Cat, Frog

Group R : Rat, Catla, Squirrel, Buffalo

Select the option that correctly identifies the odd member in each group.

- | P | Q | R |
|----------------|-----------|----------|
| A. Snake | Crocodile | Squirrel |
| B. Rohu | Frog | Catla |
| C. Pigeon | Cat | Rat |
| D. Human being | Bat | Buffalo |

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

- Septic tank is an economical method of partial treatment of sewage.
- Common disinfectant like chlorine is used during primary treatment of wastewater in a wastewater treatment plant.
- Herbivores constitute the first trophic level of a food chain.
- The decomposers operate at all levels of a food chain.

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

40. Planting of crop X in a field replenishes nitrogen into the field. Which of the following could be crop X?

- | | |
|----------|----------------|
| A. Pea | B. Cauliflower |
| C. Wheat | D. Potato |

41. How many of the following are fungal diseases of plants?

Citrus canker, Late blight of potato, Mosaic disease of mustard, Downy mildew of grapes, Leaf curl of cotton, Rust of wheat, Tobacco mosaic disease, Loose smut of wheat, Leaf curl of tomato

- | | | | |
|------|------|------|------|
| A. 6 | B. 7 | C. 4 | D. 5 |
|------|------|------|------|

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

Statement 1 : Cloning is the production of an exact copy of an animal by means of sexual reproduction.

Statement 2 : Cloning produces genetically identical copies of an organism which are called clones.

- Both statements 1 and 2 are true and statement 2 is correct explanation of statement 1.
- Both statements 1 and 2 are true and statement 2 is not the correct explanation of statement 1.
- Statement 1 is false and statement 2 is true.
- Both statements 1 and 2 are false.

43. Select the correct match.

- | Blood component | Function |
|----------------------|--|
| A. Platelets | – Help in blood clotting |
| B. Red blood cells | – Produce antibodies to kill germs |
| C. White blood cells | – Combine with carbon dioxide in the blood |
| D. All of these | |

44. Read the following statements and select the option which correctly identifies them as true (T) and false (F) ones.

- Respiration through skin is known as cutaneous respiration.
- Air exhaled by us contains 0.04% of carbon dioxide.
- The opening and closing of stomata in plants is carried out by contraction and expansion of guard cells.
- Internal respiration is a physical process in which food molecules are oxidised to give carbon dioxide and water.
- Plants growing in salty water possess specialised roots called pneumatophores.

- | (i) | (ii) | (iii) | (iv) | (v) |
|------|------|-------|------|-----|
| A. T | F | T | F | T |
| B. T | T | F | T | F |
| C. F | T | F | T | T |
| D. F | T | T | F | F |

45. Which among the given characteristics of flowers are most likely related to insect pollinated flowers?

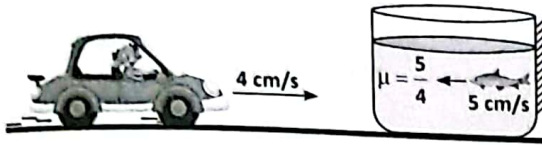
- Small, dull and inconspicuous flowers
 - Usually have nectaries to produce nectar
 - Scented and brightly coloured flowers
 - Small, light and dry pollen grains
 - Sticky stigma and pollen grains
- | | |
|---------------------------------|-----------------------------|
| A. (i), (ii) and (iv) only | B. (i), (iii) and (v) only |
| C. (i), (ii), (iv) and (v) only | D. (ii), (iii) and (v) only |

ACHIEVERS SECTION

Directions (Q.No. 46 and 47) : Read the given passage and answer the following questions.

A kid in a toy car is moving with a velocity of 4 cm/s towards a container containing a fish inside it, whereas the fish is moving towards the kid with a velocity of 5 cm/s as shown in the given figure. The wall behind the fish is silvered.

(Refractive Index of the liquid inside the container is $\mu = \frac{5}{4}$)



46. Now, consider the following statements.

- (i) Velocity of kid as observed by fish after one refraction is v_1 .
- (ii) Velocity of fish as observed by kid after one refraction is v_2 .

Which one of the following is correct?

- A. $v_1 = 10$ cm/s, $v_2 = 5$ cm/s
- B. $v_1 = 10$ cm/s, $v_2 = 8$ cm/s
- C. $v_1 = 8$ cm/s, $v_2 = 10$ cm/s
- D. $v_1 = 9$ cm/s, $v_2 = 1$ cm/s

47. Which of the following statement(s) is/are correct?

- (i) Velocity of image of fish formed by reflection from the mirror, as observed by kid is zero.
- (ii) Velocity of image of kid formed by reflection from the mirror, as observed by fish is 5 cm/s.

- A. (i) only
- B. (ii) only
- C. Both (i) and (ii)
- D. Neither (i) nor (ii)

48. Refer to the given dichotomous key. Identify P-S and select the incorrect statement regarding them.

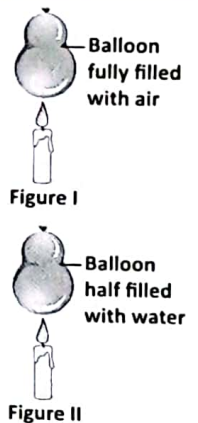
- I. (a) It is an *in-situ* method of conserving biodiversity. – Go to II
 - (b) It is an *ex-situ* method of conserving biodiversity. – Go to III
 - II. (a) It is an area reserved for the conservation of wild animals and birds. – P
 - (b) It is a specified land area in which multiple use of land is permitted for preserving biodiversity. – Q
 - III. (a) It conserves stocks of viable seeds. – R
 - (b) It conserves rare and threatened plants. – S
- A. P could be an area where hunting is strictly prohibited and private ownership rights for collecting minor forest products may be granted.

- B. Q is divided into three zones – core zone, buffer zone and manipulation zone.
- C. R could be an institute that stores frozen germplasm with the whole range of genetic variability.
- D. Q could be Jim Corbett National Park whereas S could be Madumalai Wildlife Sanctuary.

49. Read the given statements and select the option that correctly fills any three of the given blanks.

- (i) _____ are organisms that have both male and female sex organs in the same organism.
 - (ii) *Plasmodium* reproduces by _____.
 - (iii) The funnel-shaped part of the oviduct closest to the ovary is called _____.
 - (iv) The presence of _____ chromosome determines that zygote will develop into a male child.
 - (v) _____ maintains the growth of uterus during pregnancy.
 - (vi) _____ hormone is also known as sleep hormone.
- A. (i)– Unisexual, (ii)– Binary fission, (v)– Progesterone
 - B. (iii)– Infundibulum, (iv)– Y, (vi)– Melatonin
 - C. (ii)– Multiple fission, (v)– Estrogen, (vi)– Adrenaline
 - D. (i)– Hermaphrodite, (iii)– Ampulla, (iv)– X

50. Mr. Negi, a science teacher sets up an experiment as shown in the given figures. Which of the following statements are correct regarding the given experiment?



- (i) The balloon in the figure II will explode as the ignition temperature of the balloon is reached easily.
 - (ii) The balloon in the figure I will explode as the ignition temperature of the balloon is reached easily.
 - (iii) The balloon in the figure II will not explode as water increases the melting point of the balloon.
 - (iv) The balloon in the figure I will not explode as the ignition temperature of the balloon is not reached easily.
 - (v) The balloon in the figure II will not explode as water conducts the heat away from the balloon and therefore the ignition temperature of the balloon is not easily reached.
- A. (ii) and (v) only
 - B. (i), (iii) and (iv) only
 - C. (i) and (iv) only
 - D. (ii), (iii) and (v) only

SPACE FOR ROUGH WORK



SOF-TECHFEST IIT BOMBAY INNOVATION CHALLENGE



PRESENTS

INNOVATION CHALLENGE

FOR CLASSES 8, 9 & 10

Introduction

Techfest is Asia's Largest Science and Technology Festival and the Annual Science and Technology Festival of IIT Bombay. With the sole motto of nurturing young talent and promoting innovative thinking among school students, Techfest is conducting an Innovation Challenge in association with the Science Olympiad Foundation for school students across India. It is a platform for young visionaries and problem solvers to showcase their creativity, ingenuity, and technical prowess.

Guidelines:

- Appearing in the Innovation Challenge is not compulsory. In case you wish, please visit www.techfest.org/innovationchallenge. No registration fee is to be paid.
- To participate, read the following problem statement and email the answer at ic.iitbombay@sofworld.org.
- Answers should be submitted as per the following schedule:

NSO Set-A 18 th October	NSO Set-B 12 th November	NSO Set-C 3 rd December
By 27 th October	By 22 nd November	By 8 th December

PROBLEM STATEMENT

Green Innovation: Technological Breakthroughs for a Sustainable Tomorrow

As the world faces increasing environmental and societal challenges, the combination of sustainability and Artificial Intelligence (AI) offers powerful solutions. Below are three distinct ways we can approach these challenges. Select one to explore how technology can help create a more sustainable world:

- **Sustainable Plastic Waste Management** - How can we develop innovative and eco-friendly ways to manage plastic waste without reducing the use of plastic in our daily lives?
- **AI's Role in the Modern World** - Why is AI essential in today's world? How can AI help prevent crimes, enhance security, and make a positive impact on society?
- **AI and Sustainability: Building a Greener Future** - How can AI and sustainability be combined to create innovative solutions that reduce environmental harm and promote long-term eco-friendly practices?

Choose ANY ONE of the above topics and answer in the following format :

Title - Write the title of the chosen topic.

Problems - Identify the environmental, social, or industrial challenges related to your chosen topic and explain the need for sustainable or AI-powered solutions (100-150 words).

Solutions - Propose innovative ideas to address these challenges, using either sustainability, AI, or a combination of both (150-200 words).

Conclusion - Justify your solutions concerning their implementation and impact (in about 50-100 words).

Rewards:

- Each participant will be awarded a Certificate of Participation from SOF-Techfest, IIT Bombay.
- Top 20 students will be invited to Techfest 2024-25 with an accompanying adult from 17th to 19th December, 2024 with travel and accommodation provided by Techfest, IIT Bombay.
- Winners will be awarded trophies, gifts, certificates, and a visit to IIT Bombay's new Research Park, also they may get a visit to ISRO's Vikram Sarabhai Space Centre, Thiruvananthapuram.



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