NSO

CLASS 8

Contents

SCIENCE OLYMPIAD FOUNDATION

14th NSO

LEVEL - 2

Year 2011-12

CLASS24

MENTAL ABILITY

1. **Which natural number is nearest to 9217, which is completely divisible by 88?**
   (A) 9152 **(B)** 9240 **(C)** 9064 **(D)** 9184

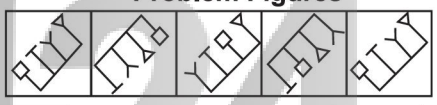
2. **The value of $\frac{1}{1\cdot2\cdot3}+\frac{1}{2\cdot3\cdot4}+\frac{1}{3\cdot4\cdot5}+\frac{1}{4\cdot5\cdot6}$ is equal to _____.**
   (A) $\frac{7}{30}$ **(B)** $\frac{11}{30}$ **(C)** $\frac{13}{30}$ **(D)** $\frac{17}{30}$

3. **The value of $\sqrt{\frac{0.081\times0.324\times4.624}{1.5625\times0.0289\times72.9\times64}}$ is equal to _____.**
   (A) 0.024 **(B)** 0.24 **(C)** 2.4 **(D)** 24

4. **If in a certain language, FLOWER is coded as UOLDVI, then how is TERMINAL coded in that language ?**
   (A) FLKPMROZ **(B)** GVINRMZO **(C)** RVNIGLKA **(D)** MNIVGYEO

5. **Select a figure from amongst the options which will continue the same series as established by the five Problem Figures.**

   Problem Figures

   (A)  **(B)**  **(C)**  **(D)** 

6. **Present ages of X and Y are in the ratio 5 : 6 respectively. Seven years hence this ratio will become 6 : 7 respectively. What is X's present age ?**
   (A) 35 years **(B)** 42 years **(C)** 49 years **(D)** Can't be determined

7. **The value of $\frac{2^{n+4}-2\times2^{n}}{2\times2^{(n+3)}}+2^{-3}$ is equal to _____.**
   (A) 2^{n+1} **(B)** $\left(\frac{9}{8}-2^{n}\right)$ **(C)** $\left(-2^{n+1}+\frac{1}{8}\right)$ **(D)** 1

8. **If '+' stands for 'division, '÷' stands for 'multiplication', '×' stands for 'subtraction and' '–' stands for 'addition', then which one the following equations is correct ?**
   (A) 18 ÷ 6 × 7 + 5 – 2 = 22 **(B)** 18 × 6 + 7 ÷ 5 – 2 = 16
   (C) 18 ÷ 6 – 7 + 5 × 2 = 20 **(D)** 18 + 6 ÷ 7 × 5 – 2 = 18

9. **Choose the correct mirror-image of figure (X) if the mirror is placed along *MN*.**

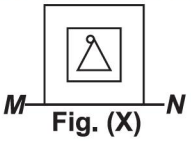
   

   Fig. (X)

   (A)  **(B)**  **(C)**  **(D)** 

10. **By selling a pen for ₹ 15, a man loses one-sixteenth of what it costs him. The cost price of the pen is _____.**
    (A) ₹ 16 **(B)** ₹ 18 **(C)** ₹ 20 **(D)** ₹ 21

11. **The simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on ₹ 4000 for 2 years at 10% per annum. The sum placed on simple interest is _____.**

(A) ₹ 1550 **(B)** ₹ 1650 **(C)** ₹ 1750 **(D)** ₹ 2000

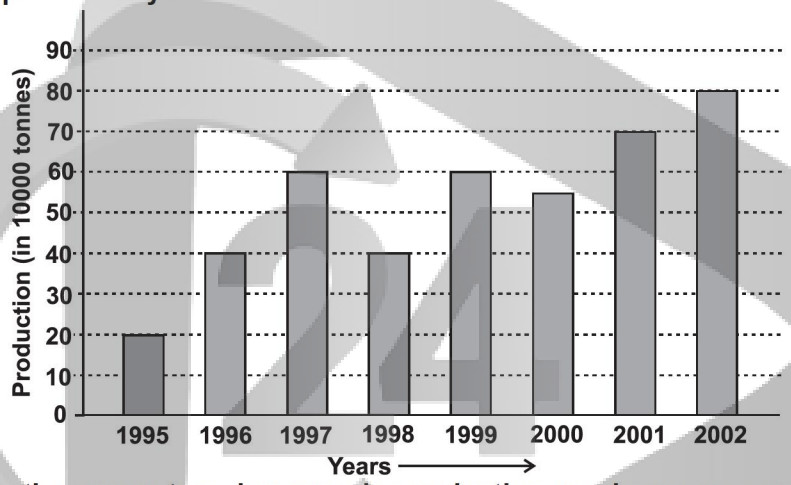
12. **The cost of cultivating a square field at the rate of ₹ 135 per hectare is ₹ 1215. The cost of putting a fence around it at the rate of 75 paise per metre would be _____.**

(A) ₹ 360 **(B)** ₹ 810 **(C)** ₹ 900 **(D)** ₹ 1800

13. **One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face card ?**

(A) $\frac{3}{13}$ **(B)** $\frac{4}{13}$ **(C)** $\frac{1}{4}$ **(D)** $\frac{9}{52}$

14. **Study the bar graph carefully.**



In which year was the percentage increase in production maximum as compared to the previous year?

(A) 2002 **(B)** 2001 **(C)** 1999 **(D)** 1996

15. **Choose the odd numeral group.**

(A) 1,4,3,8 **(B)** 2,3,3,8 **(C)** 3,2,3,8 **(D)** 5,3,2,9

SCIENCE

16. **When a light ray is reflected repeatedly by a set of parallel plane mirrors, the intensity of light rays decreases after some reflections. This is because of ____.**

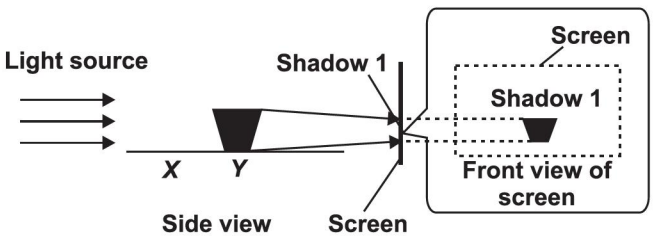
(A) Poor reflection from mirrors **(B)** Absorption of some amount of light by mirrors

(C) Dispersion of light when the rays travel through the atmosphere

(D) Scattering of light by the mirrors

17. **Sanchi conducted an experiment to understand how the position of the object can affect the shadow formed on the screen. When she placed the object at position *Y* shadow 1 was formed on the screen as shown.**

When the object was placed at position *X*, which of the following would be observed about the shadow on the screen?



1. **The shadow would be upright.** **2.** **The shadow would be inverted.**

3. **The shadow would be bigger than shadow 1.** **4.** **The shadow would be smaller than shadow 1.**

(A) 1 and 3 only **(B)** 2 and 3 only **(C)** 1 and 4 only **(D)** 3 and 4 only

18. Which of the following statements about weight is/are false?

1. Weight does not change when location changes.

2. Weight is a force.

3. Weight is measured in kilograms.

4. Weight is proportional to the amount of gravity acting on an object.

(A) 1 only **(B)** 1 and 3 only **(C)** 2 and 4 only **(D)** 1, 3 and 4 only.

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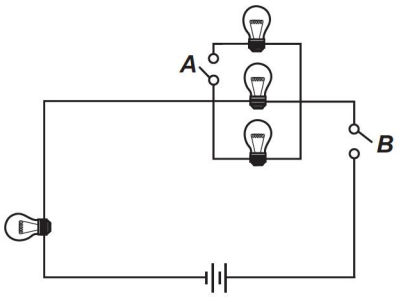
19. Study the given circuit diagram.

How many bulbs will light up when switches *A* and *B* are closed in different situations?



	Only switch *A* is closed	Only switch *B* is closed
(A)	4	2
(B)	4	3
(C)	0	2
(D)	0	3

DIRECTION (Q.Nos. 20 & 21) : Two tuning forks *A* and *B* vibrate with frequencies in the ratio 3 : 8 and their wavelengths in the ratio 4 : 5.

20. The tuning fork *A* produces relatively _____.

(A) Shriller sound than tuning fork *B*. **(B)** Flatter sound than tuning fork *B*.

(C) Louder sound than tuning fork *B*.

(D) Wave of more wavelength than that of tuning fork *B*.

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21. The wave producing lower wavelength is _____.

(A) Tuning fork *A* **(B)** Tuning fork *B*

(C) Both *A* and *B* **(D)** Cannot be determined

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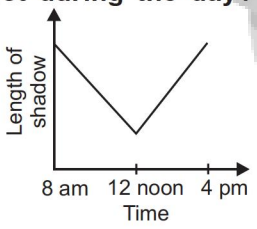
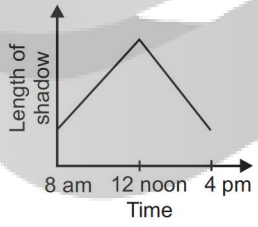
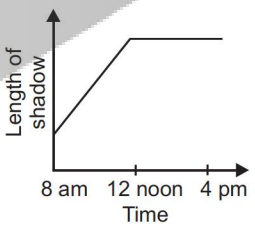
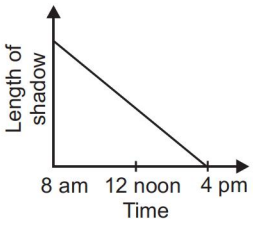
22. Which of the following graphs correctly shows the changes in the length of a shadow cast by an object during the day?

(A)


(B)


(C)


(D)


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23. When some liquid evaporates, the average speed of the molecules remaining will ____.

(A) Increase because the more energetic molecules have left

(B) Decrease because the more energetic molecules have left

(C) Remain unchanged because all molecules have about the same speed

(D) Increase because there are fewer molecules

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24. One cannot see through fog because _____.

(A) Fog absorbs light **(B)** Refractive index of fog is unity

(C) Light suffers total internal reflection at the droplets in fog

(D) Light is scattered by the droplets in fog

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25. At a particular time of the day, the ratio of length of a tree and the length of its shadow is found to be 2.5. Now the length of the shadow of a pole is 8 m. The length of the pole is ____.

(A) 15 m **(B)** 20 m **(C)** 25 m **(D)** 30 m

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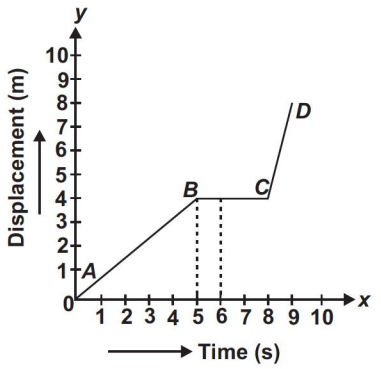
26. From the displacement-time graph shown here, find the velocity of the body as it moves from C to D.



(A) 2 m s^{-1}

(B) 3 m s^{-1}

(C) 4 m s^{-1}

(D) 5 m s^{-1}

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27. Read the statements carefully and mark the correct option.

Statement 1 : There will be no action of external force on an object moving with uniform velocity.

Statement 2 : The force acting on an object need not cause motion. It may deform the dimensions of object.

(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 and statement 2 is false. **(D)** Both statements 1 and 2 are false.

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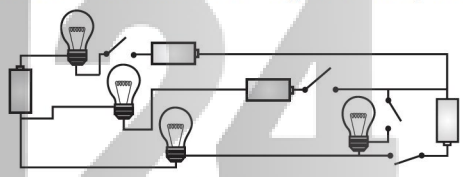
28. The electrical circuit shown below contains four light bulbs, four switches and four dry cells.



What is the minimum number of switches that has to be closed in order for all the light bulbs to be lit?

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

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29. Birds do not feel electric shock while sitting on current carrying uninsulated wires because ___.

(A) The feathers of birds act as insulator and hence the current does not pass through them

(B) The resistance offered by the body of birds is very high

(C) The current does not pass through the body as the claws of birds are non-conducting

(D) The potential difference between the two claws of the birds is very small

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30. Frictional force exists in which of the following cases ?

(A) Exists only for moving bodies. **(B)** Exists only for bodies which are at rest.

(C) Exists for both moving and non-moving bodies. **(D)** None of these.

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31. Plastic is not environment friendly because it takes several years to decompose and burning of plastic also causes formation of poisonous gas. So a responsible citizen should remember 4R principle. Here 4R stands for

(A) Renovate, Reuse, Recurrent and Recover **(B)** Report, Recall, Reduce and Recycle

(C) Reduce, Reuse, Recycle and Recover **(D)** Reduce, Reuse, Refuse and Reform

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32. Which one of the following was used for street lighting for the first time in London in 1810 and in New York around 1820?

(A) Natural gas **(B)** Coal gas **(C)** Petroleum gas **(D)** Kerosene

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33. X is a metal which can replace Y and Z both from their salt solutions. Y can replace Z but not W. W can replace both Y and Z but not X. What is the correct reactivity order of X, Y, Z and W?

(A) W > X > Y > Z **(B)** X > Y > Z > W **(C)** X > W > Y > Z **(D)** X > W > Z > Y

DIRECTION (Q.Nos. 34 & 35) : Lalita has taken sulphur powder (P) in a deflagrating spoon and burnt it and put it in a gas jar. Then she removed the spoon and added water. In another experiment she has taken water in one beaker and added a small piece of sodium (Q). After sometime she took both the solutions and checked them with litmus paper.

34. What result would she expect ?

(A) In case P : blue to red, in case Q : red to blue
(B) In both cases P and Q : blue to red
(C) In case P : red to blue, in case Q : blue to red
(D) In both cases P and Q : red to blue

35. The reaction occurring in case of (P) is

(A) $SO_2 + H_2O \rightarrow H_2SO_4$
(B) $SO_3 + 2H_2O \rightarrow H_2SO_4 + H_2O$
(C) $SO_2 + H_2O \rightarrow H_2SO_3$
(D) $2SO_3 + 2H_2O \rightarrow 2H_2SO_4 + O_2$

36. Some substances catch fire very easily like alcohol, petrol, LPG, etc. These are called inflammable substances but some do not catch fire easily like water. What could be the reason for it?

(A) Boiling point of inflammable substances is higher.
(B) Latent heat of vaporisation is lower for inflammable substances.
(C) Ignition temperature of inflammable substance is lower.
(D) Both (B) and (C).

37. Match the following and select the correct option.

Column I	**Column II**
(P) Human body metabolism	**(i) Rapid combustion**
(Q) Fire crackers	**(ii) Spontaneous combustion**
(R) Burning of domestic gas	**(iii) Slow combustion**
(S) Yellow phosphorus	**(iv) Explosion**

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

38. Which one of the following is prepared using only one type of material?

(A) Polycot **(B)** Polywool **(C)** Terrycot **(D)** Polyester

39. What will happen to the given cell if the labelled cell organelle is removed from it ?

(A) Cell will undergo autodigestion.
(B) Protein synthesis will stop.
(C) Cell will not undergo division.
(D) Cell will loose rigidity and internal structures will get unprotected.

40. _P_ are single-celled organisms with varying shapes such as round, rod or spiral. _Q_ are autotrophic organisms having undifferentiated plant bodies. _R_ are plant-like organisms exhibiting heterotrophic mode of nutrition. _S_ are organisms which exhibit characteristics of both living as well as non-living things.
Select the correct sequence of terms to complete the above paragraph.

	P	**Q**	**R**	**S**
(A)	Viruses	Algae	Fungi	Bacteria
(B)	Viruses	Fungi	Algae	Bacteria
(C)	Bacteria	Fungi	Algae	Viruses
(D)	Bacteria	Algae	Fungi	Viruses

41. Which of the following animals are correctly categorised ?

	Oviparous	Viviparous
(A)	Human, Cow	Snake, Pigeon
(B)	Hen, Snake	Human, Crocodile
(C)	Pigeon, Crocodile	Rat, Horse
(D)	Toad, Earthworm	Cockroach, Cat

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

	Column I		Column II
(a)	**Pathogen**	**(i)**	**The carriers of diseases**
(b)	**Vaccination**	**(ii)**	**Arrests growth of microorganisms**
(c)	**Pasteurization**	**(iii)**	**Microbes that cause diseases**
(d)	**Vector**	**(iv)**	**Gives immunity**

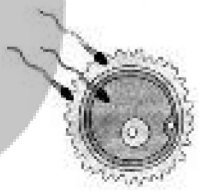
(A) (a) - (ii), (b) - (i), (c) - (iii), (d) - (iv) **(B)** (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
(C) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv) **(D)** (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)

43.

Cause	Effect
Global warming	**Ice at North and South poles may melt causing sea-level to rise & floods to occur.**

Which of the following can prevent the effect from happening ?
(A) Deforestation **(B)** Use of unleaded petrol **(C)** Use of leaded petrol **(D)** Both (A) & (B)

44. The given figure shows more than one sperm near an egg during a stage of reproduction in animals.



Which of the following statements are correct regarding this ?
(i) Female animals produce sperms.
(ii) Only one egg usually gets fertilized by many sperms.
(iii) After fertilization, egg contains the genetic materials of both parents.
(iv) Fusion of sperm and egg does not necessarily take place inside the female body.
(A) (i) & (ii) **(B)** (ii) & (iv) **(C)** (iii) & (iv) **(D)** (i), (ii) & (iv)

45. What is the correct order of agricultural practices in crop production ?
(A) Sowing → Tilling → Irrigation → Manuring → Weeding → Harvesting → Winnowing → Threshing → Storage
(B) Tilling → Sowing → Manuring → Irrigation → Weeding → Harvesting → Threshing → Winnowing → Storage
(C) Sowing → Manuring → Tilling → Irrigation → Weeding → Harvesting → Threshing → Winnowing → Storage
(D) Irrigation → Tilling → Sowing → Weeding → Manuring → Harvesting → Winnowing → Threshing → Storage

46. In a classroom discussion, three students made the following statements.

Shikha : Fertilizers are chemical substances which are rich in a particular nutrient.
Ritesh : Fertilizers increase the water holding capacity of the soil.
Abhishek : Fertilizers used in excess provide lots of humus to the soil.

Which student(s) made incorrect statement(s) ?
(A) Shikha & Ritesh **(B)** Ritesh & Abhishek **(C)** Abhishek & Shikha **(D)** Shikha only

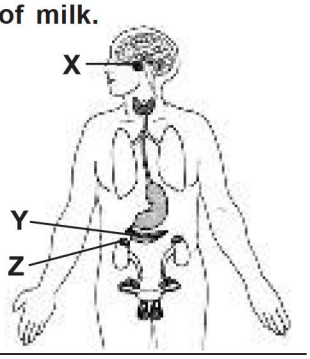
47. Which of these is an endemic species of India ?

(A)  **(B)**  **(C)**  **(D)** 

48. Read the following statements.

(i) Hormone A helps a mother to feed her baby as it induces production of milk.

(ii) Hormone B helps to regulate amount of glucose in blood so that body can get energy.



Refer the given figure and select the correct statement regarding the above given hormones.

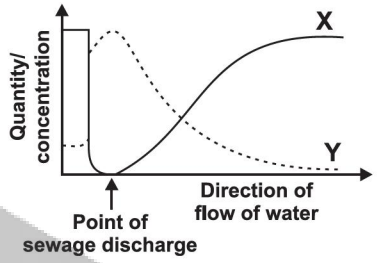
(A) Gland Z secretes hormone B.

(B) Hormone B can either be insulin or glucagon and is secreted by gland Y.

(C) A is growth hormone (GH) and is secreted by gland X.

(D) Gland Y secretes both the hormones A and B.

49. On the basis of the given graph select the correct statement.



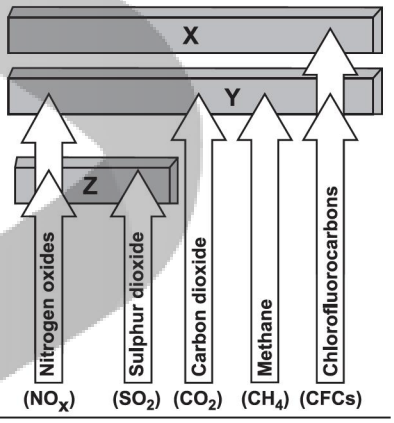
(A) X shows the amount of pollutants present in water.

(B) Y shows the population of fishes and other fresh water organisms.

(C) Y shows the amount of oxygen dissolved in water.

(D) Y shows the population of bacteria and algae.

50. The given graph shows various air pollutants and their effects labelled X, Y and Z . Identify X, Y and Z and select the correct option.



	X	Y	Z
(A)	Acid rain	Ozone hole	Green house effect
(B)	Green house effect	Ozone hole	Acid rain
(C)	Ozone hole	Green house effect	Acid rain
(D)	Acid rain	Green house effect	Ozone hole

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

15th NSO

LEVEL - 2

Year 2012-13

CLASS24

MENTAL ABILITY

1. There are six houses in a row. Mr. Lal has Mr. Bhasin and Mr. Sachdeva as neighbours. Mr. Bhatia has Mr. Gupta and Mr. Sharma as neighbours. Mr. Gupta's house is not next to Mr. Bhasin or Mr. Sachdeva and Mr. Sharma do not live next to Mr. Sachdeva. Who are Mr. Bhasin's next door neighbours?

(A) Mr. Lal and Mr. Bhasin **(B)** Mr. Lal and Mr. Sachdeva
(C) Mr. Sharma and Mr. Lal **(D)** Only Mr. Lal

2. If $x^a = y^b = z^c$ and $y^2 = zx$, then the value of $\frac{1}{a}+\frac{1}{c}$ is _____.

(A) $\frac{b}{2}$ **(B)** $\frac{c}{2}$ **(C)** $\frac{2}{b}$ **(D)** $2a$

3. If $(a^2 + b^2)^3 = (a^3 + b^3)^2$ and $ab \neq 0$, then $\left(\frac{a}{b}+\frac{b}{a}\right)^6$ is equal to _____.

(A) $\frac{a^6+b^6}{a^3b^3}$ **(B)** $\frac{64}{729}$ **(C)** 1 **(D)** $\frac{a^6+a^3b^3+b^6}{a^2b^4+a^4b^2}$

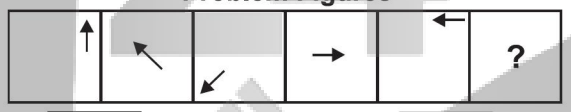
4. Choose the correct water image of the given words/numbers from amongst the options.

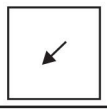
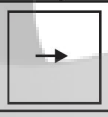
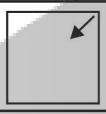
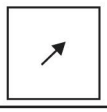
T3P2Y5

(A) ⊥3ЬƧʎƧ **(B)** ⊥ƐЬƧʎƧ **(C)** ⊥3PƧʎƧ **(D)** ⊥3ЬƧʎ5

5. Select a figure from the options which will continue the series established by the Problem Figures.

Problem Figures

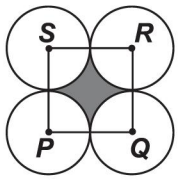


(A)  **(B)**  **(C)**  **(D)** 

6. In a bangle shop, if the shopkeeper displays the bangles in the form of a square, he is left with 38 bangles. If he wants to increase the size of square by one unit each side of the square he found that 25 bangles fall short of in completing the square. The actual number of bangles which he had with him in the shop was _____.

(A) 1690 **(B)** 999 **(C)** 538 **(D)** Can't be determined

7. *PQRS* is a square, 4 equal circles are just touching each other whose centres are the vertices *P, Q, R* and *S* of the square. What is the ratio of the shaded to the unshaded area within square?



(A) $\frac{8}{11}$ **(B)** $\frac{3}{11}$ **(C)** $\frac{5}{11}$ **(D)** $\frac{6}{11}$

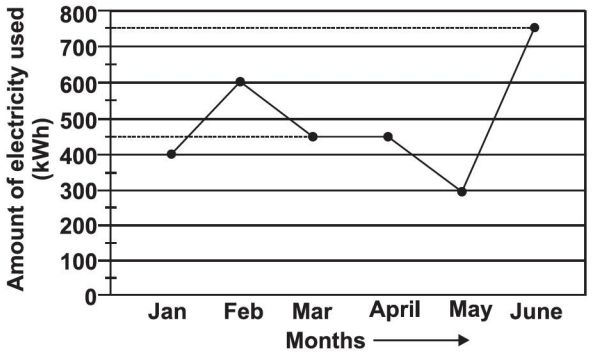
8. ₹ 100000 was invested by Mohan in a fixed deposit @ 10% per annum at CI. However, every year he was to pay 20% tax on the compound interest. How much money does Mohan has after 3 years ?

(A) ₹ 128414 **(B)** ₹ 108000 **(C)** ₹ 126079.2 **(D)** None of these

9. In an army camp, there are 800 soldiers. There is enough food for them for 60 days. If 400 more soldiers arrive at the camp, how many days will the food last?

(A) 40 days **(B)** 35 days **(C)** 45 days **(D)** 50 days

10. **The line graph shows the amount of electricity used by Mohit for the first 6 months of last year. The electricity used is charged at the rate of ₹ 1.5 per kWh for the first 400 kWh and ₹ 0.8 per kWh for usage beyond 400 kWh. An additional 12% of the amount charged is to be paid as tax. How much did Mohit pay for the electricity used in March ?**



(A) ₹ 698.8 **(B)** ₹ 403.2
(C) ₹ 700.4 **(D)** ₹ 716.8

11. **The ratio between curved surface area and total surface area of a cylinder is 2 : 3. If the total surface area be 924 cm², find the volume of the cylinder.**

(A) 2156 cm³ **(B)** 1256 cm³ **(C)** 1265 cm³ **(D)** 1862 cm³

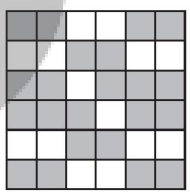
12. **A scientific calculator is available at Universal Shop in Hazratganz at 20% discount and the same is available at only 15% discount at Bhootnath Market. Pooja has just sufficient amount of ₹ 800 to purchase it at Universal Shop, Hazratganz. What is the amount that Pooja has less than the required amount to purchase it at Bhootnath?**

(A) ₹ 70 **(B)** ₹ 50 **(C)** ₹ 100 **(D)** Data insufficient

13. **Factorise $25(x + 2y)^2 - 36(2x - 5y)^2$.**

(A) $(4x - 2y)(3x + 5y)$ **(B)** $(17x - 20y)(40y - 7x)$ **(C)** $(17x - 4y)(31x - 4y)$ **(D)** $(2x - y)(x + y)$

14. **How many lines of symmetry does the figure have?**



(A) 1
(B) 3
(C) 2
(D) 0

15. **Two slips of papers are drawn from a hat having four slips labelled with 7, 8, 9 and 10. What is the probability of obtaining 7 and then 9 (the first slip is replaced before drawing the second slip)?**

(A) $\frac{1}{16}$ **(B)** $\frac{1}{8}$ **(C)** $\frac{1}{4}$ **(D)** $\frac{3}{5}$

SCIENCE

16. **The two ends of a spring are displaced along the length of the spring. All displacements have equal magnitudes. In which case the tension or compression in the spring will have maximum magnitude?**

(A) The right end is displaced towards right and the left end towards left.
(B) Both ends are displaced towards right.
(C) Both ends are displaced towards left. **(D)** None of these

17. **Read the given statements and choose the correct option.**

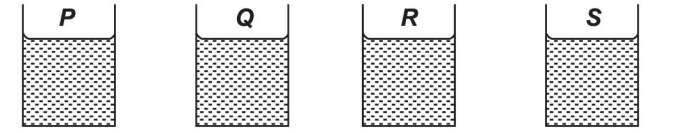
Statement 1 : When static friction acts, there is no loss of mechanical energy.

Statement 2 : When kinetic friction acts between two bodies, there is loss of mechanical energy.

(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) Statement 1 is false but statement 2 is true.

18. **Four metal cans are identical except for the colour and texture of their outer surfaces. 100 cm^3 of water at 70°C is poured into each can. Which can cool most rapidly?**

(A) *P*
(B) *Q*
(C) *R*
(D) *S*



19. **A student uses a converging lens to produce an enlarged virtual image of a scale she wishes to read accurately. The focal length of the lens is 10 cm. What is a suitable distance between the scale and the lens?**

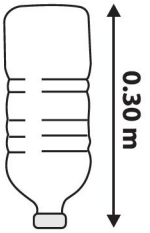
(A) 8 cm **(B)** 10 cm **(C)** 15 cm **(D)** 20 cm

20. **A Jogger runs in a straight line, with a magnitude of average velocity of 5.00 m s^{-1} for 4.00 minute and then with a magnitude of average velocity of 4.00 m s^{-1} for 3.00 minute. What is the magnitude of the final displacement from her initial position?**

(A) 1.92×10^3 m **(B)** 2.56×10^3 m **(C)** 3.19×10^3 m **(D)** 0 m

21. **A bottle is filled with water. A cap is put on the bottle and it is turned upside down. There is no air inside the bottle. The area of the cap in contact with the water is 4.0×10^{-4} m^2. The density of water is 1000 kg m^{-3} and the gravitational field strength is 10 N kg^{-1}. The water produces a force on the cap.**
What is the value of this force?

(A) 0.075 N **(B)** 0.12 N **(C)** 1.2 N **(D)** 13 N



22. **Which of the following scales are not linear in nature?**

(i) **Decibel** **(ii)** **Richter** **(iii)** **Meter**

(A) (i) only **(B)** (ii) and (iii) **(C)** (ii) only **(D)** (i) and (ii)

23. ***P* and *Q* are two blocks of different metals. They have the same volume but block *P* has twice the mass of block *Q*. When given identical quantities of energy, their temperatures rise by the same amount. Which one of the following statements is true?**

(A) The density of *P* is half that of *Q*.
(B) The density of *P* is the same as that of *Q*.
(C) The specific heat capacity of *P* is half that of *Q*.
(D) The specific heat capacity of *P* is the same as that of *Q*.

24. **Frictional forces do not exist _____.**

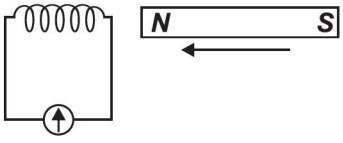
(A) On high mountains **(B)** In water **(C)** In the atmosphere **(D)** In space

25. **All the following statements about instantaneous speed is false except for _____.**

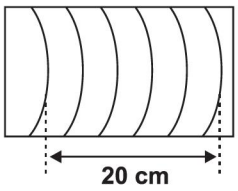
(A) Instantaneous speed is, when an object moves with the same speed throughout the journey.
(B) Instantaneous speed is measured in $cm^3\ h^{-1}$.
(C) Instantaneous speed is the average speed over a certain distance.
(D) Instantaneous speed is the speed at any instant of time during the journey.

26. **A magnet is moved into the coil of wire as shown, there is a small reading on the sensitive meter. Which change would increase the size of the reading?**

(A) Moving the south pole in
(B) Pulling the magnet out
(C) Pushing the magnet in faster
(D) Unwinding some of the turns of wire



27. The dipper in a ripple tank vibrates at a frequency of 4.0 Hz and the resulting wave pattern is photographed. The distance between the two crests shown is 20 cm. What is the speed of the wave?



(A) 4 cm s^{-1} **(B)** 5 cm s^{-1}

(C) 16 cm s^{-1} **(D)** 20 cm s^{-1}

28. What is the refractive index of a medium?

(A) The ratio of the speed of light in air to the speed of light in the medium

(B) The ratio of the speed of light in the medium to the speed of light in air

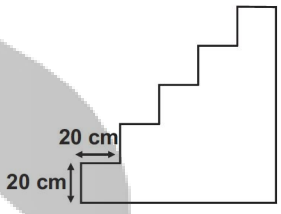
(C) The ratio of the speed of light in the medium to the speed of light in vacuum

(D) The ratio of the speed of light in vacuum to the speed of light in the medium

29. There is a hole at the bottom of a cubic container which contains oil inside. The oil flows out smoothly and is collected by a measuring cylinder. 54 cm^3 of liquid is collected in 3 minutes time. What is the average rate of fluid flow?

(A) 18 $cm^3\ s^{-1}$ **(B)** 18000 $cm^3\ s^{-1}$ **(C)** 0.3 $cm^3\ min^{-1}$ **(D)** 0.3 $cm^3\ s^{-1}$

30. Amit carried a box up the flight of stairs shown in the diagram. He did 150 J of work in the process. The mass of the box is _____.



(A) 7.5 kg

(B) 75 kg

(C) 15 kg

(D) 150 kg

31. Identify the fibres, P, Q and R using the given hints.

P. It does not get wrinkled easily, remains crisp and is easy to wash.

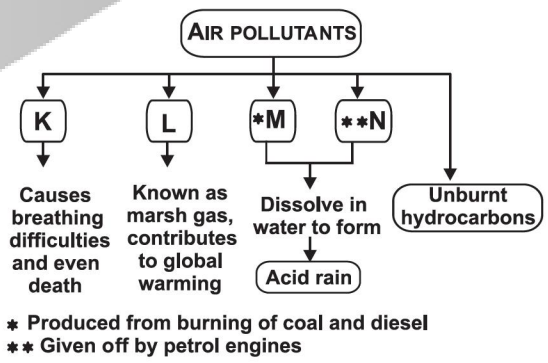
Q. It was the first fully synthetic fibre.

R. Although it is obtained from a natural source, yet it is a man-made fibre.

(A) P - Rayon, Q - Polythene, R - Terylene **(B)** P - Polyester, Q - Nylon, R - Rayon

(C) P - Nylon, Q - Polythene, R - Bakelite **(D)** P - Melamine, Q - Nylon, R - Polyester

32. Study the given flowchart and identify K, L, M and N respectively.



(A) Carbon dioxide, nitrogen oxides, methane, sulphur dioxide

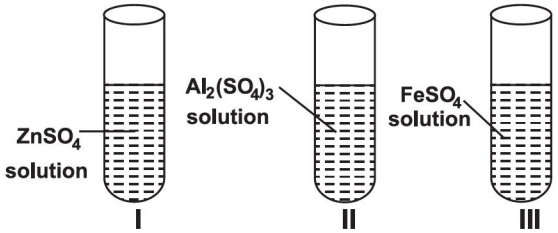
(B) Carbon monoxide, methane, sulphur dioxide, nitrogen oxides

(C) Methane, carbon monoxide, carbon dioxide, sulphur dioxide

(D) Sulphur dioxide, carbon monoxide, methane, nitrogen oxides

33. Rakshit has three test tubes containing $ZnSO_4$, $Al_2(SO_4)_3$ and $FeSO_4$ solutions. He dropped magnesium pieces into all the three test tubes. Choose the option with the correct match.

	Test tube(s) in which colour changed	Test tube(s) in which reaction occurred
(A)	III	I, II and III
(B)	I, II	III
(C)	I, III	I, II
(D)	I, II and III	I, II and III



34. Kanchan carried out an experiment in which she put one end of four rods, P, Q, R and S made up of iron, copper, carbon and zinc respectively into a container filled with boiling water. After 15 minutes, she recorded the temperature at the undipped ends of all rods.

Which rod will show the lowest temperature?

(A) P **(B)** Q **(C)** R **(D)** S

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35. Kavita wrote two sentences about calorific value of fuels.

(i) The amount of heat energy required by 1 kg of a fuel to reach its ignition temperature for the complete combustion is called its calorific value.

(ii) It is expressed in a unit called kilojoule per kg (kJ/kg).

Choose the correct sentence(s).

(A) (i) **(B)** (ii) **(C)** Both (i) and (ii) **(D)** None of these

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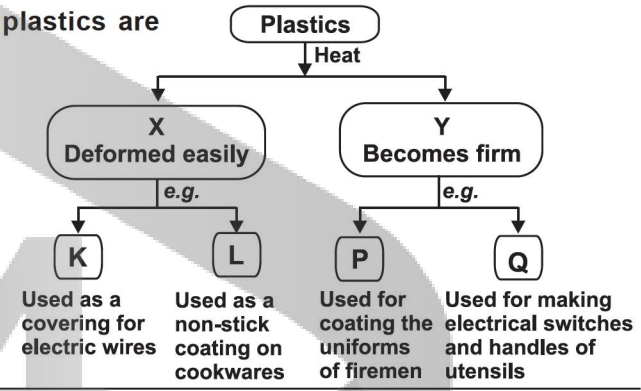
36. Study the given flowchart carefully. K, L, P and Q plastics are

	K	L	P	Q
(A)	Polystyrene,	Bakelite,	Teflon,	PVC
(B)	Polythene,	Polystyrene,	Bakelite,	PVC
(C)	PVC,	Polythene,	Polystyrene,	Bakelite
(D)	PVC,	Teflon,	Melamine,	Bakelite



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37. Choose the incorrect statement among the following.

(A) Many useful substances are obtained from petroleum and natural gas. These are termed as 'petrochemicals'.

(B) Hydrogen gas obtained from natural gas, is used in the production of fertilizers.

(C) Due to the great commercial importance of petroleum, it is also called 'black gold'.

(D) Natural gas is stored under low pressure as compressed natural gas (CNG).

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38. Which of the following is a false description about different zones of a flame?

(A) W - It is non-luminous, the hottest part and contains unburnt carbon particles.

(B) X - It is luminous and involves partial combustion.

(C) Y - It is least hot and dark.

(D) Z - It is blue zone where carbon monoxide burns.

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39. To maintain soil fertility, nutrient replenishment of soil is essential. Common methods of adding nutrients to soil are given in the box below.

P = Field fallow Q = Green manure R = Fertilizers S = Organic wastes

Which of the following statements is incorrect regarding this ?

(A) P is not best suited because it leaves a field economically useless for a year or two.

(B) R increases productivity readily but prove to be environmental hazard in long run.

(C) S can cause spread of diseases due to pathogenic cysts present in it.

(D) Q are green plants that are ploughed back into soil to supply specific nutrients in desired ratio.

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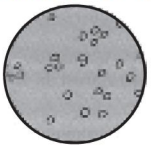
40. Which of the following Petri-dishes is most likely to contain a *Lactobacillus* colony?

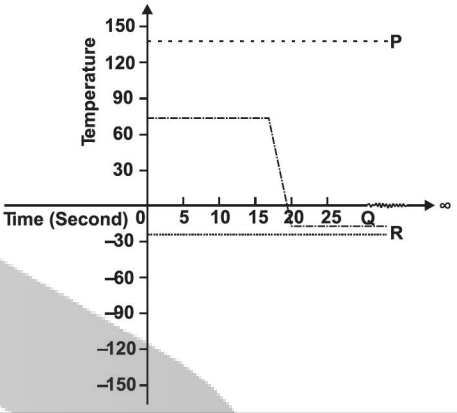
(A)  **(B)**  **(C)**  **(D)** 

41. Analyze the given table regarding the condition of the fields and other requirements and identify the irrigation systems best suited for the two farmers Sohan and Harish.

Condition \ Farmer	Sohan	Harish
Field surface	Irregular	Levelled
Soil type	Sandy	Clayey
Crop	Fruit plants	Cereals
Financial budget	High	Low

	Sohan	Harish
(A)	Sprinkler system	Drip irrigation
(B)	Drip irrigation	Sprinkler system
(C)	Surface irrigation	Drip irrigation
(D)	Drip irrigation	Surface irrigation

42. The given graph shows three methods of food preservation P, Q and R, which work on the principle that at particular temperature the growth of food spoiling microbes is adversely affected. Which of the following options is correct regarding this?



(A) P is ultra-heat treatment in which food is heat sterilized and then stored in microbe-free container.

(B) Q is pasteurization which preserves food for few days if stored in a cool place.

(C) R is freeze preservation which preserves food for longer when it is kept frozen.

(D) All of these

43. Three friends made the following statements.

Sunil : Indian giant squirrel is found only in India. It is an X species.

Shruti : *Eichhornia* now seen growing widely in ponds and lakes was naturally not found in India. It is an Y species.

Priyanka : Indian rhinoceros will no longer be seen on earth if not conserved. It is an Z species.

Identify the terms X, Y and Z and select the correct option.

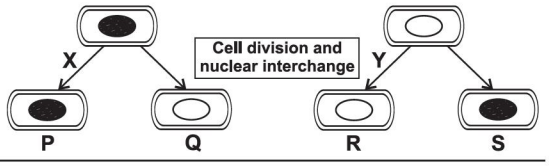
(A) X - Endemic; Y - Extinct; Z - Endangered

(B) X - Epidemic; Y - Exotic; Z - Extinct

(C) X - Endemic; Y - Exotic; Z - Endangered

(D) X - Epidemic; Y - Exotic; Z - Endangered

44. Shashank performed an experiment where he took two unicellular organisms X and Y which reproduce by binary fission. By using a micropipette (a scientific tool), he interchanged nuclei of two of the daughter organisms just after cell division as shown in the figure. Which of the following is the most likely result of his experiment?



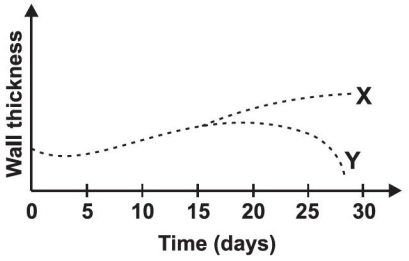
(A) Organism Q will show characteristics of parent organism X.

(B) Organisms P and S will show similar characteristics.

(C) Organism R will show characteristics of organism X.

(D) Organisms P and Q will show similar characteristics.

45. The given graph represents the changes in thickening of uterine wall in two women X and Y over a period of one month. What should be the correct conclusion regarding this?



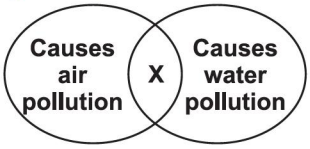
(A) Woman X has conceived.

(B) Woman Y is undergoing menopause.

(C) Both women X and Y will undergo menarche in the next month.

(D) Both (A) and (B)

46. Refer the given Venn diagram. Which among the following would most likely be X?



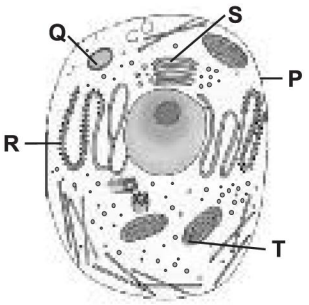
(A) Acid rain

(B) Vehicular exhausts

(C) Factory discharge

(D) Agricultural runoff water

47. Refer the given figure of a typical cell and select the option that incorrectly matches the cell modification with its function?



(A) In a free moving cell like WBC, structure P will be more elastic and pliable.
(B) A cell that is extensively involved in secreting substances such as enzymes, structures R and S will be highly developed.
(C) A cell that is extensively involved in protein synthesis, will have large number of structure Q.
(D) A cell that needs lots of energy will have abundant number of structure T.

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48. Read the given statements.

(i) IVF is a treatment for infertility when a woman is able to produce ovum however, problems of the Fallopian tube make fertilization difficult.
(ii) Asexual reproduction is a rapid and easier method of multiplication.
(iii) Unicelled organisms reproducing by binary fission are referred to as 'immortals' because actual death of the parent does not occur.
(iv) Metamorphosis is the transformation of an adult animal to larval form.

Which of the given statements are correct?

(A) (ii) and (iv) **(B)** (i), (ii), (iii) and (iv) **(C)** (i), (ii) and (iii) **(D)** (ii), (iii) and (iv)

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

Statement 1 : Diabetes is characterized by inefficient glucose metabolism.
Statement 2 : In diabetes, malfunctioning or malsecretion of insulin affects glucose metabolism.

(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
(C) Statement 1 is correct but statement 2 is incorrect. **(D)** Both statements 1 and 2 are incorrect.

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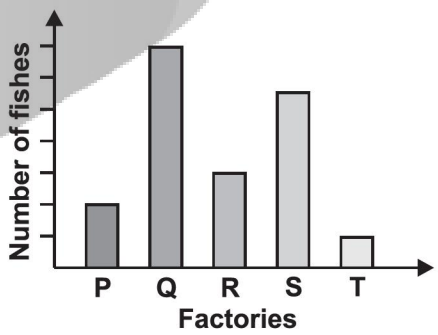
50. Five chemical factories P, Q, R, S and T are located in different cities along a river bank. Municipal officer, in order to estimate the pollution caused by these factories, counted the number of fishes present at the places where these factories discharged their wastes into the river. A graph as shown here, is plotted based on the observations.



What can be inferred from the graph?

(A) Factory R dumps the least toxic wastes in the river.
(B) Factory P dumps its waste into river after removing toxic wastes.
(C) Fishes are maximally harmed by the toxic wastes of factory Q.
(D) Factory T dumps the most toxic wastes in the river.

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

16th NSO

LEVEL - 2

Year 2013-14

MENTAL ABILITY

1. Factorise : $15(x - 2y)^2 - 8(x - 2y) - 16$
   A. $(5x + 10y - 9)(3x + 2y - 4)$
   B. $(9x - 4y)(x - 2y)$
   C. $(5x - 10y + 4)(3x - 6y - 4)$
   D. $(9x - 4y + 3)(3x - 2y + 4)$

2. A person has enough money to buy 25 cycles worth ₹ 500 each. How many cycles will the person be able to buy, if each cycle now costs ₹ 125 more?
   A. 40 cycles
   B. 70 cycles
   C. 20 cycles
   D. 65 cycles

3. It is possible to make a meaningful word with the second, the third, the ninth, the tenth, the thirteenth, the fourteenth and the eighteenth letters of the word COUNTERINTELLIGENCE, using each letter only once, except the second letter, which should be used twice, which of the following will be the third letter of that word? If no such word can be formed give 'X' as the answer, and if only two such words can be made give answer 'Y'. And if more than two such words can be formed give answer 'Z'.
   A. C
   B. X
   C. Y
   D. Z

4. Which of the following numbers will be obtained if the second digit of the lowest number is added to the third digit of the highest number after adding 4 to each number?
   129 642 921 476 308
   A. 5
   B. 6
   C. 7
   D. 8

5. Simplify : $\dfrac{9^{5/2} - 3 \times 7^0 - \left(\frac{1}{81}\right)^{-\frac{1}{2}}}{(27)^{2/3} - \left(\frac{8}{27}\right)^{2/3}}$
   A. 0
   B. 16
   C. 27
   D. 77

6. Read the following information and answer the question given below it:
   1. Seven students P, Q, R, S, T, U and V take a series of tests.
   2. No two students get the same marks.
   3. V always scores more than P.
   4. P always scores more than Q.
   5. Each time either R scores the highest and T gets the least, or alternatively S scores the highest and U or Q scores the least.

   If S is ranked sixth and Q is ranked fifth, which of the following can be true?
   A. V is ranked first or fourth.
   B. R is ranked second or third.
   C. P is ranked second or fifth.
   D. U is ranked third or fourth.

7. If the first element from the left end interchanges place with the tenth element from the left end, similarly second with ninth, third with eighth, fourth with seventh, and so on, then which of the following will be seventh to the left of eighth element from the right end?
   A B 7 C D 9 Z Y ★ © P 2 M C K S 3 5 N T @
   A. 9
   B. 7
   C. D
   D. C

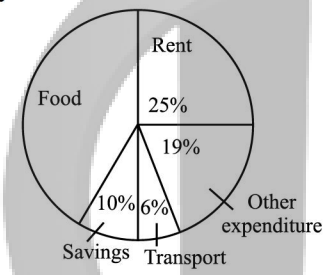
8. Divide : $30x^3y^2 - 20xy^3 + 12xy - 13y$ by $-5xy$
   A. $-6x^2y + 4y^2 - \dfrac{12}{5} + \dfrac{13}{5x}$
   B. $-6x^2y - 4y^2 + \dfrac{12}{5} + \dfrac{13}{5x}$
   C. $-6x^2y + 4y^2 - 5 + 13$
   D. $-6x^2y - 4y^2 + \dfrac{11}{6} - 12$

9. A cylindrical container of radius 28 cm contains sufficient water to submerge a rectangular solid of dimensions 32 cm × 22 cm × 14 cm. Find the rise in the level of water, when the solid is completely submerged.
   A. 6 cm
   B. 4 cm
   C. 7 cm
   D. 9 cm

10. Akash purchased two articles for ₹ 750 each. He sold these articles, gaining 6% on one and losing 4% on the other. Find his gain or loss per cent in the whole transaction.
A. 2% loss
B. 3% gain
C. 1% gain
D. 1% loss

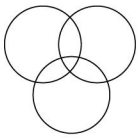
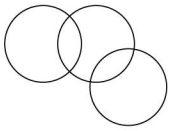
11. Ashok took a loan of ₹ 2400 from a finance company at 15% p.a. simple interest for 2 years. He lent it to Rajesh at the same rate of interest, compounded annually. Find the gain of Ashok after 2 years.
A. ₹ 54
B. ₹ 20
C. ₹ 45
D. ₹ 64

12. The given pie chart shows what Mr. Varun does with his monthly income of ₹ 3000.

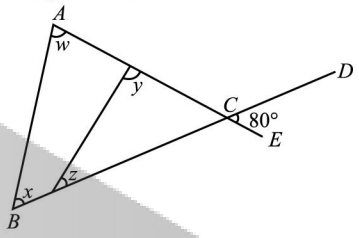


If he spends the same amount every month on food, how long does he take to spend ₹ 14400 on food?
A. 10 months
B. 540 months
C. 1 year
D. $1\frac{1}{2}$ years

13. Select the Venn diagram which best illustrates the relationship between : "Nurse, Doctor, Women".

A. 
B. 
C. 
D. 

14. In the given figure (not drawn to scale), *ACE* and *BCD* are straight lines. Find the value of $\angle w + \angle x + \angle y + \angle z$.



A. 150°
B. 175°
C. 200°
D. 210°

15. The sum of numerator and denominator of a fraction is 10. If the numerator is increased by 1 and denominator is reduced by 1, then value of the fraction would be $\frac{2}{3}$. Find the fraction.
A. $\frac{5}{7}$
B. $\frac{3}{7}$
C. $\frac{4}{7}$
D. $\frac{2}{7}$

SCIENCE

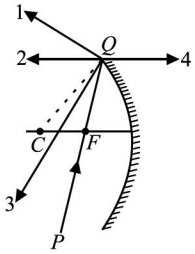
16. A hockey player is moving northward and suddenly turns westward with the same speed to avoid an opponent. The force that acts on the player is _____.
A. Frictional force along westward
B. Muscle force along southward
C. Frictional force along south-west
D. Muscle force along south-west.

17. Water waves produced by a motor boat sailing in water are _____.
A. Neither longitudinal nor transverse
B. Both longitudinal and transverse
C. Only longitudinal
D. Only transverse.

18. A Centigrade and Fahrenheit thermometers are dipped in boiling water. The water temperature is lowered until the Fahrenheit thermometer registers 140. The fall in temperature as registered by centigrade thermometer is _____.
A. 30°
B. 40°
C. 60°
D. 80°

19. Earthquakes can occur because of _____.
A. Movement of tectonic plates
B. Volcanic eruption
C. Mine blasts
D. All of these.

20. The direction of a ray of light incident on a concave mirror is shown by PQ while directions in which the ray would travel after reflection is shown by four rays marked 1, 2, 3 and 4.
Which of the four rays correctly shows the direction of reflected ray?



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

21. A motor cyclist rides around the well with a round vertical wall and does not fall down while riding because _____.
A. The force of gravity disappears
B. He loses weight some how
C. He is in this path due to the force exerted by surrounding air
D. The frictional force of the wall balances his weight.

22. An air conditioner is rated 240 V, 1.5 kW. The air conditioner is switched on for 8 hours each day. How much electrical energy is consumed in 30 days?
A. 360 kW h
B. 8.64 kW h
C. 120 kW h
D. 240 kW h

23. Read the given statements and select the correct option.
Statement-1 : Echo is produced when sound is incident on hard and polished surface.
Statement-2 : Sound energy can be totally reflected by objects with soft and loose texture.
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 and statement-2 is false.
D. Both statements-1 and 2 are false.

24. A stone which has a mass of 12 g and a density of 3 g cm^{-3}, is lowered into 20 cm^3 of water in a measuring cylinder. What will be the new reading on the measuring cylinder?
A. 20 cm^3
B. 24 cm^3
C. 40 cm^3
D. 16 cm^3

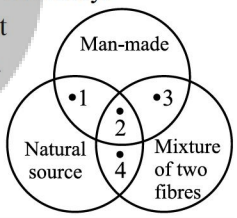
25. A planet is revolving around the sun in an elliptical orbit. Which of the following remains constant?
A. Linear momentum
B. Angular momentum
C. Kinetic energy
D. Potential energy

26. Read the given statements and select the correct option.
Statement-1 : A horse has to pull a cart harder during the first few steps of his motion.
Statement-2 : The first steps are always difficult.
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 and statement-2 is false.
D. Both statements-1 and 2 are false.

27. The nearest and farthest planets from the sun are _____ respectively.
A. Mars and Venus
B. Mercury and Pluto
C. Venus and Pluto
D. Earth and Neptune.

28. An under-water swimmer cannot see very clearly even in absolutely clear water because of
A. Absorption of light in water
B. Scattering of light in water
C. Reduction of speed of light in water
D. Change in the focal length of eye lens.

29. Study the given Venn diagram carefully.
Identify the points which represent polycot and rayon respectively.



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

30. Choose the correct statement among the following.
A. The substances which vapourise during burning, do not give flames.
B. The substances which have very high ignition temperature are called inflammable substances.
C. When the match is struck against the rubbing surface, some red phosphorus gets converted into white phosphorus.
D. The job of a fire extinguisher is to cut off the supply of carbon dioxide, and hence the fire is controlled.

31. Using the given hints, identify the option with correct coal product and its use.
(1) Almost pure form of carbon.
(2) Mixture of about 200 substances.
A. (1) - Coke, manufacture of steel
B. (1) - Coal tar, manufacture of paints
C. (2) - Coke, manufacture of plastics
D. (2) - Coal tar, extraction of metals

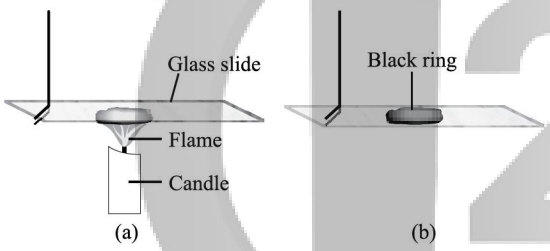
32. An element *X* is soft and dull in appearance. It reacts with oxygen to form *Y*, which when dissolved in water, forms *Z*. *Z* turns China rose indicator to magenta colour. Identify *Z*.

A. Sulphuric acid B. Sulphurous acid
C. Nitrous acid D. Nitric acid

33. Fill in the blanks in the given paragraph by choosing the correct option.
Over million of years, absence of air, _____*p*_____ temperature and ___*q*_____ pressure transformed the dead organisms into _____*r*_____ and *s*.
One of the various constituents of *s*, _____*x*_____ is used in paints and road surfacing.

	p	*q*	*r*	*x*
A.	Low	Low	Petroleum	Coal tar
B.	High	High	Natural gas	Bitumen
C.	High	Low	Natural gas	Coal tar
D.	Low	High	Petroleum	Bitumen

34. Observe the given diagrams carefully.



A circular blackish ring is formed on the glass slide due to _____.

A. Deposition of unburnt wax particles present in the non-luminous zone of the flame
B. Deposition of unburnt carbon particles present in the luminous zone of the flame
C. Partial combustion of wax in yellow middle zone of the flame
D. Incomplete combustion of carbon particles in outer blue zone of the flame.

35. Match Column I with Column II and choose the correct option using the codes given below.

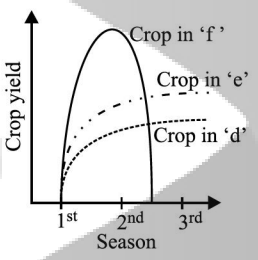
	Column I		**Column II**
p.	Teflon	(i)	Making electrical switches
q.	PVC	(ii)	Flame resistant
r.	Melamine	(iii)	Non-stick coating of cookwares
s.	Bakelite	(iv)	Thermoplastic

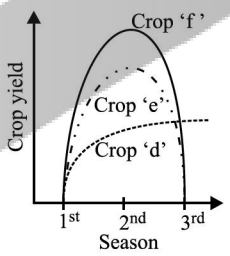
A. p - (ii), q - (i), r - (iv), s - (iii)
B. p - (i), q - (ii), r - (iii), s - (iv)
C. p - (iv), q - (iii), r - (i), s - (ii)
D. p - (iii), q - (iv), r - (ii), s - (i)

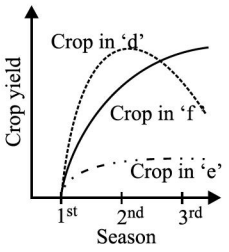
36. Why animals like frog and fish produce hundreds of eggs while hens and humans produce one egg at a time?

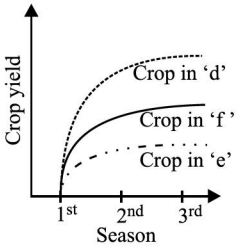
A. In frogs and fish, internal fertilization occurs.
B. Eggs of hens and humans are exposed to external environment.
C. Eggs of frogs and fish are produced inside the mother's body and hence they are protected.
D. Eggs of frogs and fish are preyed by predators and are exposed to environment.

37. A farmer has a cropping field which is specifically deficient in nitrogen. He divided his field into three parts *i.e.*, d, e and f. He wants to grow cereal crops for three successive seasons. He supplied field 'd' with ammonium nitrate and ammonium sulphate and field 'e' with manure. He grew crop of pulses between cereal crops in field 'f'. Which of the following best represents the effect of these different treatments on the crop yield after three crop seasons?

A.


B.


C.


D.


38. A farmer's crop is repeatedly getting infected from a fungal disease. The soil in which crop is sown is clayey. Which of these irrigation methods would lessen the chance of infection?

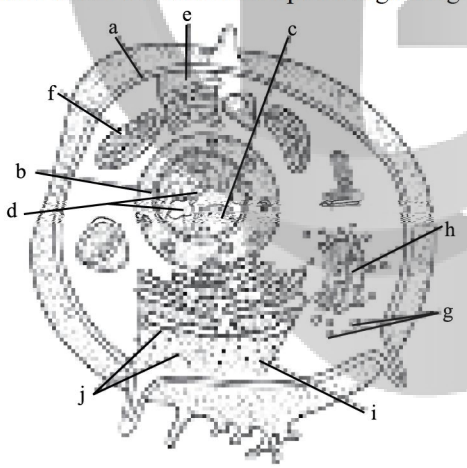
A. Furrow irrigation
B. Drip irrigation
C. Basin irrigation
D. Sprinkler irrigation

39. Match the columns and select the correct option.

	Column I		Column II
(a)	*Pencillium notatum*	(i)	Production of yoghurt
(b)	*Chlorella*	(ii)	Nitrogen fixation
(c)	*Rhizobium*	(iii)	Sewage disposal
(d)	*E.coli*	(iv)	Antibiotics
		(v)	Production of vitamins in the large intestine

A. a-(iii), b-(v), c-(ii), d-(i)
B. a-(iv), b-(iii), c-(ii), d-(v)
C. a-(iv), b-(ii), c-(iii), d-(v)
D. a-(v), b-(iv), c(ii), d-(i)

40. The given figure shows a typical animal cell with its parts being labelled as 'a – j'. Identify the labelled parts and select the incorrect option regarding it.



A. The organelles *e*, *h*, *g* and *i* are membrane-bound organelles which function in close coordination with one another.
B. '*f*' organelle is responsible for the synthesis of fats inside the cells and it stores Ca^{2+} for release during muscle contraction.
C. *a* and *b* have selective permeability *i.e.*, they allow only selected substances to pass inwardly.
D. '*j*' is the site for protein synthesis. It allows hereditary message from '*d*' to get translated into proteins.

41. Read the given statements with one or two blanks and select the option which correctly fill the blanks of any two statements.

(a) _____ is being maintained by _____, which is now known as World Conservation Union.
(b) _____ is specified land area in which multiple use of land is permitted for preserving biodiversity.
(c) _____ are species which are likely to move to _____ category in near future, if causative factors continue to operate.
(d) _____ are those specific regions of mega-biodiversity nations which have large numbers of _____ species.

A. a - Red Data Book, IUCN
c - Vulnerable, endangered
B. c - Endangered, rare
d - Hot spots, extinct
C. b - Biosphere reserve
d - Hot spots, exotic
D. a - Red Data Book, WWF
b - Wild life sanctuary

42. Which of the following is not true?

A. Rotation of crops improves the fertility of soil.
B. Rotation of crops saves a lot of nitrogenous fertilizers.
C. Rotation of crops helps in the weed control and pest control.
D. Rotation of crops helps in mixing of nutrients uniformly.

43. What observation can be made by viewing the slides under the microscope on binary fission in *Amoeba* and budding in yeast?

A. The daughter cells of *Amoeba* and the bud of yeast are smaller than their respective parent cells.
B. The daughter cells of *Amoeba* and the bud of yeast are of the same size as their respective parent cells.
C. The daughter cells of *Amoeba* are bigger than the parent cells but bud of yeast is smaller than the parents.
D. The daughter cells of *Amoeba* are smaller than the parents but bud of yeast is larger than the parents.

44. Identify the given microorganism and select the incorrect statement regarding this.

A. It is a saprophyte commonly called as black bread mould.
B. It reproduces by means of spores.
C. It results in the spoilage of food materials.
D. It is a parasitic fungus that causes various diseases in plants, animals and humans.

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

Statement 1 : The chemical substances produced by microorganisms which in low concentration are antagonistic to the growth of other microorganisms are called as antibiotics.

Statement 2 : A preparation of a dead or attenuated pathogen, which when injected into a healthy person, provides immunity against a number of diseases, is called as vaccine.

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.

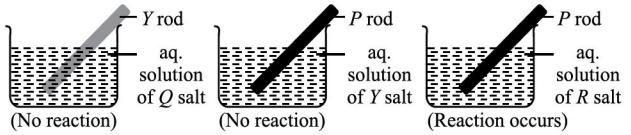
ACHIEVERS SECTION

DIRECTION (Q. 46 & 47) : The sliding frictional force between a 4 kg box and the floor is 15 N. It is pushed across the floor with a constant force such that it accelerates at 0.8 ms^{-2}.

46. What is the force applied to the box?
A. 9.1 N
B. 18.2 N
C. 3.6 N
D. 6.2 N

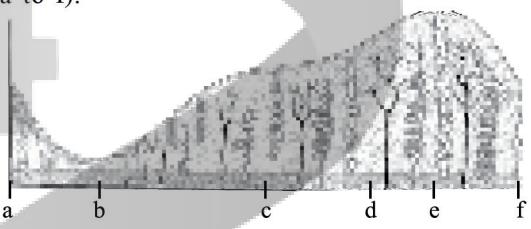
47. If this same force calculated is applied to the box which is now placed on a frictionless floor what is the new acceleration produced?
A. 8.2 ms^{-2}
B. 16.2 ms^{-2}
C. 4.6 ms^{-2}
D. 2.3 ms^{-2}

48. A student performed various experiments to investigate about the reactivities of four unknown elements, *P*, *Q*, *R*, *X* and *Y*.



Metals *P* and *R* can react with dilute acids to produce hydrogen gas while *X* cannot.
Identify the correct order of reactivity.
A. *Q* > *Y* > *P* > *R* > Hydrogen > *X*
B. *Q* > *X* > *R* > *P* > *Y*
C. *X* > *P* > *Q* > *Y* > *R* > Hydrogen
D. *P* > *Y* > *R* > *Q* > Hydrogen > *X*

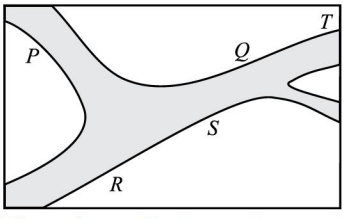
49. The given diagram shows changes in uterine lining during a menstrual cycle (divided in five phases, a to f).



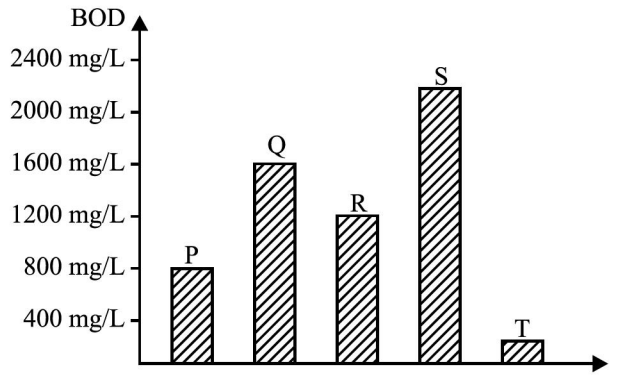
(i) When release of the egg from the ovary is expected to happen?
(ii) When menstruation is expected to occur?
(iii) If the egg gets fertilized, when implantation of embryo is expected to occur?

A.	i-d,	ii-a to b,	iii- e to f
B.	i-c to d,	ii-e to f,	iii- a to b
C.	i-c,	ii-a to b,	iii- d to e
D.	i-d to c,	ii-c,	iii- e to f

50.



The given diagram represents the plot of a river stream across a town. Water samples are collected from the river from 5 different places *P*, *Q*, *R*, *S* and *T*. The BOD of the collected water samples is shown in the following bar diagram.



Note : *Biological oxygen demand or BOD is a measure of oxygen required by aerobic decomposers for the biochemical degradation of the organic materials.*

(a) On which of the places (P to T) the highest amount of organic material is released into the river water?

(b) Where does a water treatment plant most likely built?

A. a - R, b - Between P and Q
B. a - S, b - Between Q and T
C. a - Q, b - Between R and S
D. a - S, b - Between P and R

SPACE FOR ROUGH WORK

SCIENCE OLYMPIAD FOUNDATION

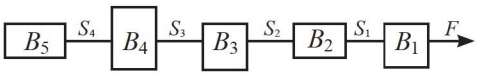
18th

NSO

LEVEL - 2

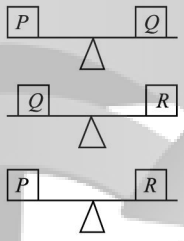
Year 2015-16

1. Five blocks, B_1, B_2, B_3, B_4 and B_5 of different masses are connected by four identical strings S_1, S_2, S_3 and S_4 as shown in the figure. They are pulled by a steadily increasing force F. Which of the following strings is most likely to break?



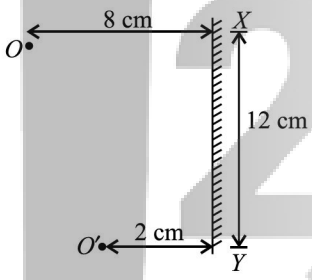
A. S_1 B. S_2
C. S_3 D. S_4

2. Three blocks, P, Q and R are balanced on a beam with the pivot at the midpoint. The correct order of blocks in terms of increasing mass, is



A. $P < Q < R$
B. $R < P < Q$
C. $P < R < Q$
D. $Q < P < R$

3. A source of light O is located at a distance of 8 cm from a plane mirror. The reflected ray O' is detected 2 cm from the mirror at a vertical displacement of 12 cm. The point of reflection is at a distance of

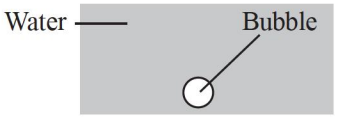


A. 6.0 cm from X B. 7.2 cm from X
C. 2.4 cm from Y D. 3.6 cm from Y

4. Solve the following riddle by identifying X, Y, Z.
X : I am a cooking ingredient and a conductor of electricity.
Y : I am used in an electric circuit when a weak current flows through it.
Z : I am coated on iron bridges to protect it from corrosion and formation of rust.

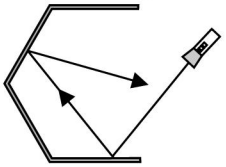
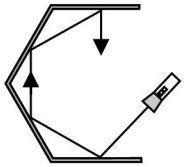
	X	*Y*	*Z*
A.	Lemon juice	LED	Chromium
B.	Lemon juice	CFL	Gold
C.	Vinegar	LED	Zinc
D.	Vinegar	CFL	Silver

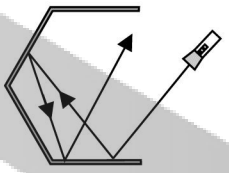
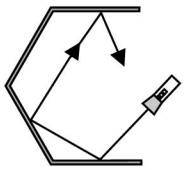
5. The diagram shows a bubble at the bottom of a pool. Assuming that the temperature of the pool is constant throughout the water, which of the following describes the change of the pressure and the density of air in the bubble as it rises to the surface?



	Pressure	**Density**
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

6. A beam of light from a torch is aimed at an arrangement of four plane mirrors. Which diagram correctly shows the path that the light beam follows?

A.  B. 

C.  D. 

7. Consider the given cases.
I : A ball moves vertically upwards after being kicked by a boy.
II : The ball falls vertically downwards after reaching the maximum height.

Name the forces responsible for the motion of ball in the two cases.

	I	**II**
A.	Muscular force	No force
B.	Muscular force	Gravitational force
C.	Frictional force	No force
D.	Frictional force	Gravitational force

8. Which of the following statements is incorrect?
A. Pressure in a liquid increases with depth, but at the same depth it is equal in all directions.
B. The air above presses down on us with a force equal to that exerted by a mass of 1 kg, on every cm^2.
C. Atmospheric pressure increases as height above sea level increases.
D. Pressure is greater when area of contact is smaller.

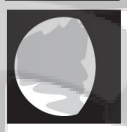
9. The distance of Alpha Centauri from Earth is about 4.3 light years. The time taken by the light to reach Earth from Alpha Centauri is about
A. 1.35×10^6 s B. 1.35×10^7 s
C. 1.35×10^8 s D. 1.35×10^9 s

10. An object vibrates 7200 times in 8 minutes. A girl standing close to the object hears
A. A sound of frequency $\frac{7200}{8}$ Hz
B. A sound of frequency $\frac{7200 \times 8}{60}$ Hz

C. A sound of frequency $\frac{7200 \times 60}{8}$ Hz

D. No sound.

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

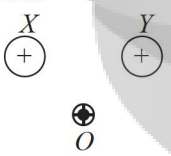
Column I		Column II
P. Waxing crescent moon	1.	
Q. Waning gibbous moon	2.	
R. Waxing gibbous moon	3.	
S. Waning crescent moon	4.	

A. P - 1, Q - 3, R - 2, S - 4
B. P - 3, Q - 1, R - 4, S - 2
C. P - 4, Q - 2, R - 3, S - 1
D. P - 2, Q - 4, R - 1, S - 3

12. The loudness of sound coming from murmur in a quite library is about 30 decibel while that from a car horn is about 120 decibel. The ratio of the amplitudes of vibrations producing these sounds is

A. 1 : 1 B. 1 : 2
C. 1 : 4 D. 1 : 16

13. The given figure shows a small positively charged sphere O, kept in between two larger positively charged spheres X and Y which are fixed.



In which direction will the sphere O move?

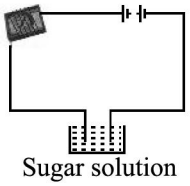
A. Up B. Down
C. Left D. Right

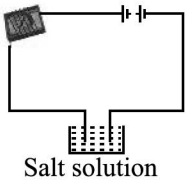
14. Read the given statements carefully.
(i) Lighting a matchstick.
(ii) Tying shoe laces.
(iii) Applying the brakes on a cycle.
(iv) Writing on the blackboard with a chalk.
(v) Treaded tyres of vehicles.

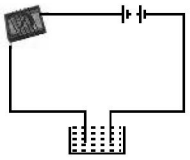
In which of the following cases is the friction helpful?

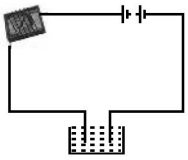
A. (i) and (v) only
B. (i), (iv) and (v) only
C. (ii), (iv) and (v) only
D. (i), (ii), (iii), (iv) and (v)

15. In which of the following will the compass needle show deflection?

A. 

B. 

C. 

D. 

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

Statement 1 : Parallel rays are incident on a surface but the reflected rays are not parallel. This type of reflection is called diffused reflection.

Statement 2 : Diffused reflection occurs due to failure of laws of reflection.

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 and statement 2 is false.
D. Both statements 1 and 2 are false.

17. In a game of tug-of-war, two teams P and Q pull at a rope in opposite directions.

Forces applied by the members of team P are 125 N, 137 N and 209 N whereas that by the members of team Q are 129 N, 186 N and 146 N. Then

A. The rope will move towards team P
B. The rope will move towards team Q
C. The rope will not move at all
D. Movement of rope cannot be predicted.

18. Which of the following statements are correct about planet Venus?
(i) It rotates from west to east while the Earth rotates from east to west.
(ii) It shows phases just like the Moon.
(iii) It appears in the eastern sky before sunrise and in the western sky just after sunset.
(iv) It has no satellite of its own.
(v) It is the second brightest star in the night sky.

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

19. A special bathroom mat keeps Rohan safe from slipping and falling in his bathroom. It does this by
A. Reducing the amount of friction between his feet and the bathroom floor
B. Keeping the bathroom floor free from moss
C. Helping Rohan's feet stay dry while he takes his bath
D. Creating more friction under Rohan's feet, as he steps on the mat.

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

	Column I		Column II
(p)	Rayon	(i)	Does not get wrinkled easily
(q)	Bakelite	(ii)	Used to make electrical switches
(r)	PVC	(iii)	Artificial silk
(s)	Polyester	(iv)	Thermoplastic

A. (p) - (iv), (q) - (iii), (r) - (i), (s) - (ii)
B. (p) - (iii), (q) - (iv), (r) - (ii), (s) - (i)
C. (p) - (iii), (q) - (ii), (r) - (iv), (s) - (i)
D. (p) - (ii), (q) - (i), (r) - (iii), (s) - (iv)

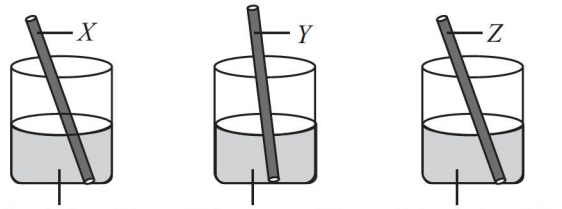
21. Most of the non-metals
A. are lustrous
B. are malleable and ductile
C. react with oxygen to produce acidic oxides
D. react with water and acids to produce hydrogen gas.

22. Which of the following statements is incorrect?
A. Coke is used in place of coal tar for metalling the roads.
B. Petrochemicals are used in the manufacture of detergents, fibres, polythene, etc.
C. Naphthalene balls are obtained from coal tar.
D. Coke is used in the manufacture of steel and in the extraction of many metals.

23. Fill in the blanks by choosing an appropriate option. Matchstick head contains (1) and (2). The rubbing surface has powdered (3) and a little (4). When the matchstick is struck against the rubbing surface, some (4) gets converted into (5). This immediately reacts with (2) in the matchstick head to produce enough heat to ignite (1) and start the combustion.

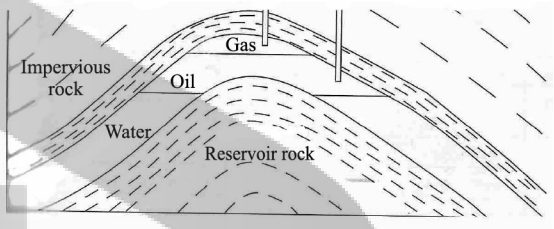
	1	2	3	4	5
A.	antimony trisulphide	potassium chlorate	glass	red phos-phorus	white phos-phorus
B.	potassium chlorate	antimony trisulphide	red phos-phorus	glass	white phos-phorus
C.	antimony trisulphide	potassium chlorate	glass	white phos-phorus	red phos-phorus
D.	red phos-phorus	antimony trisulphide	potassium chlorate	glass	white phos-phorus

24. Ankita, a class 8 student arranged the given experimental set-up to study the reactivity of three different metals *X*, *Y* and *Z*.



Metals *X*, *Y* and *Z* are respectively
A. Cu, Al and Fe
B. Ag, Fe and Zn
C. Fe, Cu and Al
D. Al, Cu and Fe

25. Look at the given figure showing petroleum and natural gas deposits.



The layer containing petroleum oil and gas is above that of water because
A. Oil and gas are heavier than water and do not mix with it.
B. Oil and gas are lighter than water and get mixed with it.
C. Water is lighter than oil and gas and does not mix with them.
D. Oil and gas are lighter than water and do not mix with it.

26. Values of ignition temperatures of different substances are listed in the given table.

Substance	Ignition temperature
I	10°C
II	50°C
III	65°C
IV	35°C

Increasing order of the inflammability of the given substances is
A. I < IV < II < III
B. III < II < IV < I
C. IV < I < III < II
D. II < III < I < IV

27. Which of the following statements about thermosetting plastics are correct?
1. Bakelite and melamine are thermosetting plastics.
2. They get deformed easily on heating and can be moulded easily to make toys, combs, etc.
3. Melamine resists fire and can tolerate heat better than other plastics.

4. When moulded once, they cannot be softened by heating.
A. 1, 2 and 4 only B. 1 and 2 only
C. 1, 3 and 4 only D. All of these

28. Read the following statements carefully.
W : I am very reactive and catch fire if exposed to air. To prevent this, I am stored in water.
X : I am a good conductor of heat and acquire a reddish-brown coating on exposure to moist air.
Y : I am soft and have dull appearance. I form acids on reacting with oxygen and water.
Z : I am malleable, ductile and acquire a dull green coating on exposure to moist air.
Identify *W*, *X*, *Y* and *Z*.

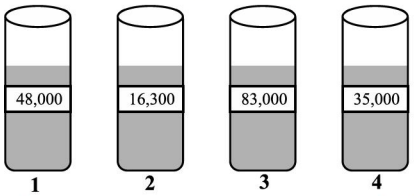
	W	*X*	*Y*	*Z*
A.	Phosphorus	Copper	Sulphur	Iron
B.	Phosphorus	Iron	Sulphur	Copper
C.	Sulphur	Iron	Phosphorus	Copper
D.	Copper	Phosphorus	Iron	Sulphur

29. Geeta marked the statements about fire extinguishers, given by her teacher as true or false.

S. No.	Statements	True or False
1.	Water is suitable fire extinguisher for all types of fires.	True
2.	Carbon dioxide is the best extinguisher for fires involving electrical equipments and inflammable materials.	True
3.	Fire extinguisher cylinders contain CO_2 as a liquid at high pressure.	False
4.	Fire extinguisher cuts off the supply of fuel and brings down the atmospheric temperature.	False

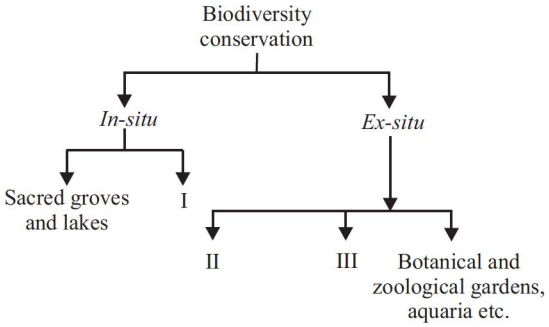
Which of these statements are marked incorrectly by her?
A. 1 and 3 only B. 2 and 4 only
C. 1 and 4 only D. None of these

30. Mrs. Nitika, a science teacher has collected few fuel samples in different glass jars and put labels on them with their calorific values (in kJ/kg).



She asked her students to arrange these fuels in the increasing order of fuel efficiency. The correct order is
A. 4 < 2 < 3 < 1 B. 1 < 3 < 2 < 4
C. 2 < 4 < 1 < 3 D. 3 < 1 < 4 < 2

31. Identify I, II and III in the given flow chart and select the correct option.



A. I - Cryopreservation, II - Biosphere reserve, III - National park,
B I - Gene bank, II - Wildlife sanctuary, III - Home garden
C. I - Biosphere reserve, II - National park, III - Wildlife sanctuary
D. I - Biosphere reserve, II - Gene bank, III - Cryopreservation

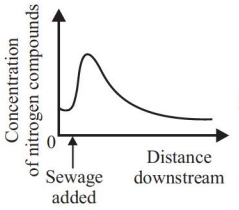
Direction : Read the following passage and answer questions 32 and 33.
Microbial diseases that can spread from an infected person to a healthy person through air, water, food or physical contact are called *X*. There are some insects and animals that are *Y* of disease causing microbes. Housefly is one example.

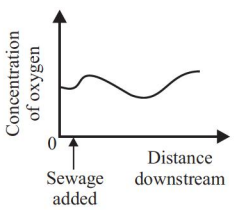
32. Which of the following can be an example of *X* in the passage?
A. Typhoid
B. Allergy
C. Asthma
D. Rickets

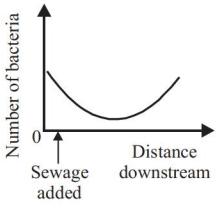
33. Which of the following is an incorrect pair of animal that works as *Y* and the disease it is associated with?
A. Rat - Plague
B. Cockroach - Hepatitis B
C. *Culex* - Filaria
D. *Anopheles* - Malaria

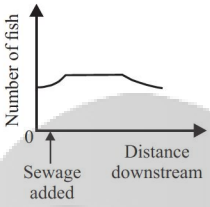
34. Which of the following statements is/are correct regarding mixed cropping?
(i) Mechanical harvesting becomes easier.
(ii) It increases biodiversity.
(iii) It removes some nutrients specifically from the crop field.
(iv) Outbreaks of pests and diseases can spread very rapidly.
(v) The crops with different maturation times are grown together.
A. (i) and (ii) only
B. (ii) and (v) only
C. (iii) and (iv) only
D. (iii), (iv) and (v) only

35. Which graph shows changes that occur in a river after being polluted by sewage?

A. 

B. 

C. 

D. 

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

Statement 1 : The chemical substances produced by microorganisms which in low concentration are antagonistic to the growth of other microorganisms are called as antibiotics.

Statement 2 : A preparation of a dead or attenuated pathogen, which when injected into a healthy person, provides immunity against a specific disease or number of diseases, is called a vaccine.

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.

37. Select the option that correctly fills the blanks in any two of the given statements.

(i) _____ refers to the plants found in a particular area.
(ii) _____ species are those which are going to be extinct in near term future.
(iii) The lion tailed macaque is included in _____ species in red data book.
(iv) A place rich in _____ species is called hotspot.

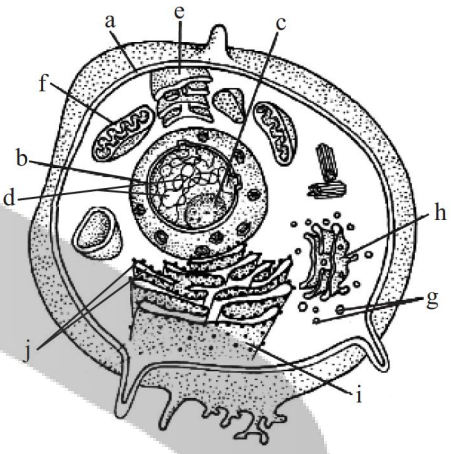
A. (i) Fauna, (ii) Endangered
B. (iii) Endangered, (iv) Endemic
C. (i) Flora, (iii) Vulnerable
D. (ii) Rare, (iv) Endangered

38. Select the correct differences between National Park and Sanctuary.

	National Park	Sanctuary
(i)	It is meant for protection of both flora and fauna.	It is meant for protection of fauna only.
(ii)	Grazing is allowed.	Grazing is not allowed.
(iii)	Private ownership is permitted.	Private ownership is not permitted.
(iv)	*E.g.*, Jim Corbett National Park, Yellowstone Park etc.	*E.g.*, Vellode Bird Sanctuary, Sultanpur Bird Sanctuary.

A. (i) and (iii) B. (i) and (iv)
C. (ii) and (iii) D. (ii) and (iv)

39. The given figure shows a typical animal cell with its components labelled as 'a – j'.



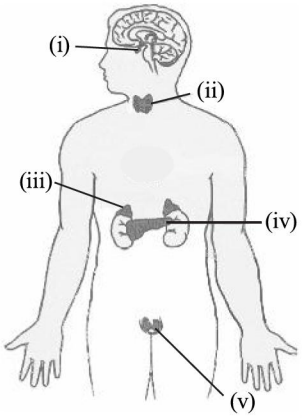
Identify the labelled components and select the incorrect statement regarding them.

A. The organelles '*e*', '*h*', '*g*' and '*i*' are membrane-bound structures which function in close coordination with one another.
B. '*f*' organelle is responsible for the synthesis of fats inside the cells and it stores Ca^{2+} for release during muscle contraction.
C. '*a*' and '*b*' are selectively permeable membranes.
D. '*j*' is the site for protein synthesis. It allows hereditary message from '*d*' to get translated into proteins.

40. A student examined a particular plant cell through its various stages of growth. After making various measurements, he realised that the increase in cell size was largely due to enlargement of the central vacuole rather than an increase in the amount of cytoplasm. Why might this be an advantageous strategy for the cell?

A. Enlarging the cytoplasm would make the cell less turgid.
B. Enlarging the vacuole would make it unnecessary for the cell wall to stretch.
C. Enlarging the vacuole would minimise any lowering of the surface area - volume ratio of the cytoplasm.
D. All of these

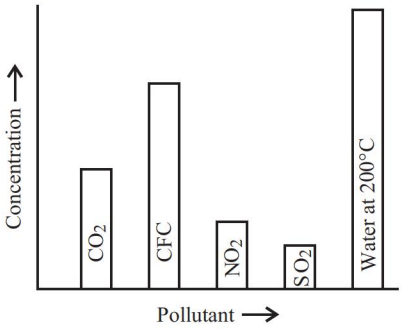
41. The given figure represents various endocrine glands present in human body. Identify these glands and select the correct option.



A. Low secretions of gland (i) can result in dwarfism.
B. Gland (iv) controls development of puberty characters in an individual.
C. Glands (ii) and (iii) work in close coordination to maintain blood sugar level.
D. Gland (v) secretes hormones that help regulate the rate of metabolism.

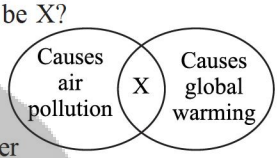
42. Plant *X* is a vascular and invasive plant species that grows densely over the surface of a lake at a very high rate, due to pollution in water. It has been linked to oxygen depletion of the water, in spite of the fact that it is photosynthetic.
Which of the following accounts for this contradiction?
A. While being photosynthetic, *X* consumes oxygen at a faster rate than it releases the same, because of its high rate of growth.
B. Because *X* is highly invasive, it incorporates a large quantity of oxygen in its biomass.
C. When *X* dies, the bacteria that decompose its dead body consume the oxygen dissolved in water and grow rapidly.
D. None of these

43. The given graph shows estimated amount of different pollutants present in emission from a factory. Which of the following is a likely outcome of this?



A. Global warming and ozone layer depletion
B. Acid rain
C. Thermal pollution
D. All of these

44. Refer to the given Venn diagram. Which among the following would most likely be X?



A. Acid rain
B. Vehicular exhausts
C. Oil spills
D. Agricultural runoff water

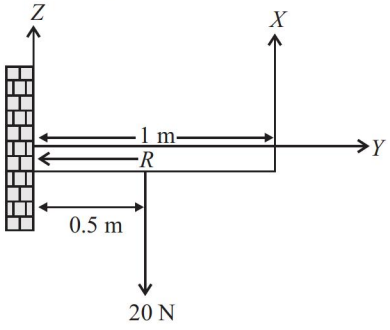
45. Match the following agricultural tasks with their respective implements and select the correct option.

Agricultural tasks	Implements
(a) Tilling	(i) Combine
(b) Sowing	(ii) Trowel
(c) Irrigation	(iii) Seed drill
(d) Weeding	(iv) Plough
(e) Harvesting	(v) Sprinkler

A. (a)-(v), (b)-(ii), (c)-(iv), (d)-(i), (e)-(iii)
B. (a)-(iv), (b)-(iii), (c)-(v), (d)-(ii), (e)-(i)
C. (a)-(iii), (b)-(iv), (c)-(v), (d)-(i), (e)-(ii)
D. (a)-(ii), (b)-(iii), (c)-(v), (d)-(iv), (e)-(i)

ACHIEVERS SECTION

Direction : Read the given paragraph carefully and answer the questions 46 and 47.
Refer to the given figure.

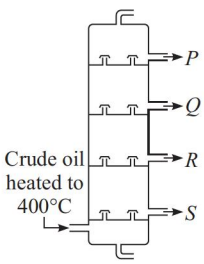


A thin bar is hinged to the wall. It remains in equilibrium. Five forces acting on the bar are shown in the figure.

46. What is the moment due to the force *Y*?
A. 0 N m
B. 10 N m
C. 20 N m
D. Data insufficient

47. What are the values of forces *X* and *Z* respectively?
A. 15 N, 5 N
B. 10 N, 10 N
C. 20 N, 0 N
D. Data insufficient.

48. Petroleum contains a large number of components having different boiling points. They are separated by fractional distillation as shown in the given figure :
The boiling point range of few fractions of petroleum is given in the table.

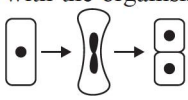


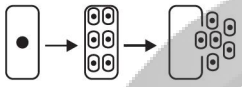
Fraction	Boiling point range
Fuel oil	350 – 400°C
Petrol	40 – 170°C
Diesel	250 – 350°C
Kerosene	170 – 250°C

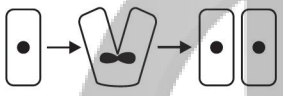
Identify *P*, *Q*, *R* and *S*.

	P	***Q***	***R***	***S***
A.	Fuel oil	Diesel	Kerosene	Petrol
B.	Kerosene	Petrol	Fuel oil	Diesel
C.	Petrol	Kerosene	Diesel	Fuel oil
D.	Diesel	Fuel oil	Petrol	Kerosene

49. Refer to the given figures which show three different types of fission. Select the option which correctly matches them with the organism in which they occur.

(i) 

(ii) 

(iii) 

	(i)	**(ii)**	**(iii)**
A.	*Euglena*	*Plasmodium*	*Amoeba*
B.	*Plasmodium*	*Paramoecium*	*Euglena*
C.	*Paramoecium*	*Plasmodium*	*Euglena*
D.	*Euglena*	*Paramoecium*	*Amoeba*

50. Read the given paragraph with few blanks in it.
During the process of cloning Dolly, a cell was collected from the _____ of a _____ ewe and an egg was collected from _____ ewe and was enucleated. The nucleus from the mammary gland cell was taken, and inserted into this enucleated egg and the egg (_____) was implanted into the _____ ewe which gave birth to Dolly after due time.
Now select the option that will correctly fill the blanks in the above paragraph.

A. Ovarian follicle, Finn Dorsett, Scottish blackface, haploid, Finn Dorsett
B. Ovarian follicle, Scottish blackface, Finn Dorsett, diploid, Finn Dorsett
C. Mammary gland, Finn Dorsett, Scottish blackface, diploid, Scottish blackface.
D. Mammary gland, Finn Dorsett, Scottish blackface, haploid, Finn Dorsett

SPACE FOR ROUGH WORK

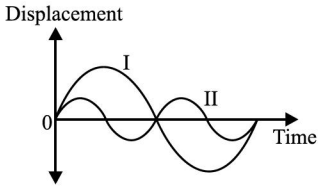
SCIENCE OLYMPIAD FOUNDATION

19th NSO

LEVEL - 2

Year 2016-17

1. The displacement-time graph of two notes I and II are shown.
Which note is louder and which note has a higher pitch?



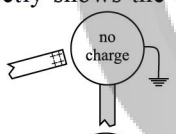
	Louder	Higher pitch
A.	I	I
B.	I	II
C.	II	I
D.	II	II

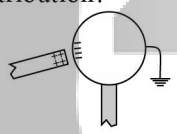
2. Match column-I with column-II and select the correct option from the codes given below.

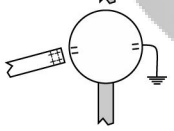
	Column-I		Column-II
(a)	Polaris	(i)	Laghu saptarishi
(b)	Big dipper	(ii)	Dhruv tara
(c)	Orion	(iii)	Vrihat saptarishi
(d)	Ursa minor	(iv)	Mriga

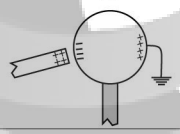
A. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
B. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
C. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
D. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

3. A charged rod is held close to one side of a metal ball and the other side is earthed. Which diagram correctly shows the charge distribution?

A. 

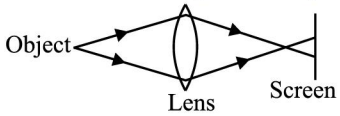
B. 

C. 

D. 

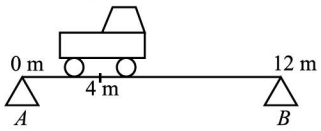
4. Read the given statements and select the correct option.
Statement 1 : Mountaineers often encounter the problem of nose bleeding when they reach high altitudes.
Statement 2 : The blood pressure of their body becomes much less than the atmospheric pressure, making the blood vessels burst.
A. Both statements 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.

5. A lens forms a blurred image of an object on a screen.



How can the image be focused on the screen?
A. Move the screen away from the lens and object.
B. Use a brighter object at the same position.
C. Use a lens of longer focal length at the same position.
D. None of these.

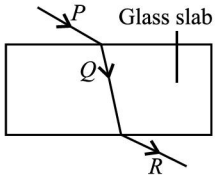
6. A 12 m long uniform bridge weighing 100000 N is being supported at the two ends. A lorry weighing 30000 N is parked at the 4 m mark as shown in the figure. What are the forces acting on the bridge by support *A* and support *B* respectively?



	Support *A*	Support *B*
A.	70000 N	60000 N
B.	60000 N	70000 N
C.	65000 N	65000 N
D.	90000 N	40000 N

7. Which of the following options is true when a multi-plug adapter is used to connect many appliances to the same socket?
A. The current drawn from the mains gets higher and overheating may occur.
B. The voltage across the live and neutral wires increases and overheating may occur.
C. The flow of the current will be slowed down and the power to each appliance will reduced.
D. The appliances will be damaged due to the higher current that flows through each appliance.

8. The diagram shows a ray *PQR* travelling through a glass slab. Which of the following options gives the correct name for all three parts of the ray?



	P	*Q*	*R*
A.	Incident ray	Emergent ray	Refracted ray
B.	Incident ray	Refracted ray	Emergent ray
C.	Emergent ray	Incident ray	Refracted ray
D.	Emergent ray	Refracted ray	Incident ray

9. Which of the following statements are incorrect?
(i) It is easier to roll than to slide some heavy object over another fixed object.
(ii) If there is less friction between the car tyres and road, then the car can move forward very smoothly without skidding.
(iii) Friction helps a person to climb a tree or a pole.
(iv) Friction helps us to light a matchstick.
(v) Ball bearings are designed to increase friction between moving parts of machines.
A. (ii) and (iii) only

B. (i), (ii), (iii) and (iv) only
C. (iii), (iv) and (v) only
D. (ii) and (v) only

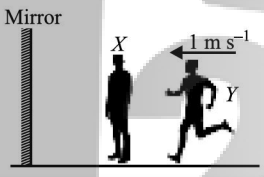
10. Read the given statements and select the correct option.

Statement 1 : When a sitar string is plucked lightly then it produces a feeble sound.

Statement 2 : Loudness of sound depends on the amplitude of vibrations of vibrating object.

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.

11. Man *X* is standing in front of a plane mirror while man *Y* is running towards him from behind. If the man *Y* is running at a speed of 1 m s^{-1}, how many metres nearer does the man *Y* seem to be away from man *X* after 5 seconds?



A. 7 m
B. 5 m
C. 6 m
D. 10 m

12. Which of the following statements are incorrect?

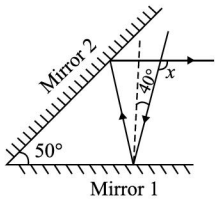
(i) In an LED, the longer lead is anode, which is always connected to the negative terminal of the battery.
(ii) If electrodes are immersed in water, and current is passed, oxygen bubbles are formed on the electrode connected to negative terminal of the battery.
(iii) Most liquids that conduct electricity are solutions of acids, bases and salts.
(iv) Tin cans, used for storing food are made by electroplating tin on iron, because tin is less reactive than iron.

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

13. An earthquake of magnitude 8 on Richter scale is how many times more destructive than an earthquake of magnitude 6 ?

A. 100
B. 1000
C. 1500
D. 2000

14. The diagram shows two plane mirrors inclined at an angle of 50° to each other. A ray is incident on mirror 1, then the deviation *x* (shown in the figure) of ray after two reflections is

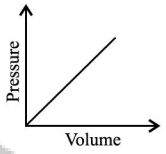


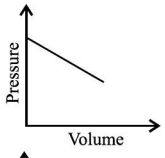
A. 50°
B. 100°
C. 120°
D. 150°

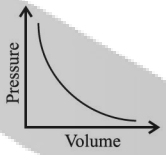
15. In an experiment to measure the speed of sound in air, Binny stands 40 m from a wall and claps loudly. At the instant she hears the echo, she claps again. She does this activity 25 times in 5 s. Which calculation gives the speed of sound (in ms^{-1}) in air?

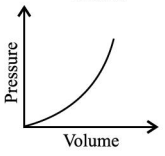
A. $\frac{25\times2\times40}{5}$
B. $\frac{5}{25\times40}$
C. $\frac{25\times2\times5}{40}$
D. $\frac{25\times40}{5}$

16. Which graph shows the relationship between the pressure and volume of a fixed mass of a gas in a container at constant temperature?

A. 

B. 

C. 

D. 

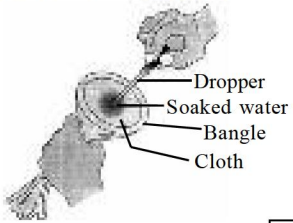
17. Read the given statements and select the correct option.

Statement 1 : Sound travels faster on a rainy day than on a dry day.

Statement 2 : The velocity of sound depends upon the medium.

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. Statement 1 is false but statement 2 is true.

18. Ria, a class 8 student wanted to compare the water absorption capacity of different fabrics. She held the cloth tightly on a bangle and added water dropwise in the centre of the ring as shown in the figure.



Then, she counted the number of drops till the soaked water touched the ring and recorded her observations in the given table.

Fibre	No. of drops
P	7
Q	5
R	3
S	12

Fibres *P*, *Q*, *R* and *S* could be respectively

A. Cotton, silk, nylon and wool
B. Silk, nylon, cotton and wool
C. Wool, nylon, silk and cotton
D. Wool, cotton, nylon and silk.

19. The given table shows some properties of four substances *P*, *Q*, *R* and *S*.

S. No.	Substance	Melting and boiling points	Reaction with water
1	*P*	Low	Reacts vigorously
2	*Q*	High	Reacts only with steam
3	*R*	High	Does not react with water
4	*S*	High	Forms protective oxide

Study the table carefully and identify *P*, *Q*, *R* and *S*.

	P	***Q***	***R***	***S***
A.	Sodium	Iron	Gold	Copper
B.	Calcium	Aluminium	Phosphorus	Gold
C.	Potassium	Zinc	Graphite	Aluminium
D.	Sodium	Magnesium	Copper	Iron

20. Fill in the blanks with the most appropriate option. '*W*' is a very reactive metal, reacts vigorously with oxygen and water therefore, stored in__(1)__. '*X*' is a non-metal, soft and dull and, forms__(2)__oxides with oxygen. '*Y*' is very reactive__(3)__, catches fire if exposed to air, therefore, stored in water. '*Z*' does not react with dilute hydrochloric acid even on heating but it reacts with sulphuric acid. When it is exposed to moist air for long, it acquires a dull __(4)__coating.

A.	1-Water,	2-Basic,	3-Metal,	4-Reddish brown
B.	1-Kerosene,	2-Acidic,	3-Metal,	4-Red
C.	1-Kerosene,	2-Acidic,	3-Non-metal,	4-Green
D.	1-Water,	2-Basic,	3-Non-metal,	4-Green

21. Read the given paragraph carefully and fill in the blanks by choosing the appropriate option.

__(i)__ is a thick dark, strong smelling liquid found deep in the earth. Unrefined (i) is called __(ii)__ and __(iii)__ gets collected over (i) inside the earth. During fractional distillation of (i), the fraction with __(iv)__ boiling point condenses in the uppermost region and uncondensed __(v)__ comes out of the fractionating tower.

	(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**
A.	Petrol	Petroleum	Methane gas	Highest	Natural gas
B.	Kerosene	Petrol	Hydrogen gas	Lowest	Methane gas
C.	Petroleum	Crude oil	Natural gas	Lowest	Petroleum gas
D.	Petrol	Petroleum	Hydrogen gas	Highest	Natural gas

22. Which of the following statements are correct?

I. Substance which undergoes spontaneous combustion have ignition temperature higher than the room temperature.

II. Respiration is a special combustion reaction at body temperature.

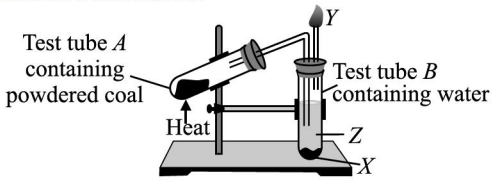
III. Formation of rust is an example of slow combustion.

IV. Combustion is an exothermic reaction.

A. I and II only B. II and IV only

C. I, II and IV only D. II, III and IV only

23. Observe the given figure carefully and choose the incorrect statement.



A. Naphthalene balls are obtained from *X*.

B. *Y* is used as a source of heat.

C. *Z* is used for making fertilizers.

D. No residue is left behind in test tube *A* after all the gases have stopped being evolved.

24. Rohan burned a substance *X* and collected the evolved vapours in a test tube making sure that they do not escape. Then he added small amount of water to the test tube. The solution so formed turned blue litmus red.

Rahul burned a substance *Y*, collected the white ash formed and dissolved it in water. The solution so formed turned red litmus blue. Substances *X* and *Y* could be respectively

A. P and Mg B. Ca and P

C. Mg and S D. S and Mg

25. Match the column I with column II and mark the correct option from the given codes.

	Column I		**Column II**
(a)	Polyester	(i)	Prepared by using wood pulp
(b)	Teflon	(ii)	Used for making parachute and stockings
(c)	Rayon	(iii)	Used for making non-stick cookwares
(d)	Nylon	(iv)	Fabrics do not wrinkle easily

A. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

B. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

C. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

D. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

26. Four metals *K*, *L*, *M* and *N* are added to the following solutions one by one. The observations made are as follows :

Metal	**$FeSO_4$**	**$CuSO_4$**	**$ZnSO_4$**	**$AgNO_3$**
K	No reaction	Displacement	No reaction	No reaction
L	Displacement	No reaction	No reaction	No reaction
M	No reaction	No reaction	No reaction	Displacement
N	No reaction	No reaction	No reaction	No reaction

Which of the given solutions can be easily stored in a container made up of any of these metals?

A. $FeSO_4$ B. $CuSO_4$
C. $ZnSO_4$ D. $AgNO_3$

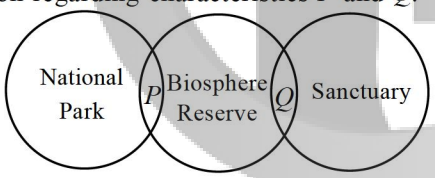
27. Which of the following statements about plastics are true?
(i) All plastics are thermosetting and have linear arrangement of monomers.
(ii) Plastics with crosslinked monomers are also known.
(iii) Most of the thermoplastics can be recycled.
(iv) Plastics do not react with water and air.
A. (i) and (ii) B. (i), (iii) and (iv)
C. (i) and (iv) D. (ii), (iii) and (iv)

28. Sahil performed an experiment in the lab to test whether a substance produces flame on burning or not. He recorded his observations in the given table.

S.No.	Material	Forms flame
1.	Candle	✓
2.	Magnesium	✓
3.	Camphor	×
4.	Kerosene	×
5.	Charcoal	×

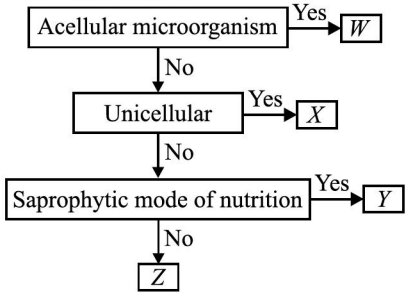
The correct observations are
A. 1, 2 and 5 B. 1, 4 and 5
C. 1, 3 and 5 D. 1, 3 and 4

29. Refer to the given Venn diagram and select the correct option regarding characteristics *P* and *Q*.



A. *P* - Protection of both flora and fauna
Q - Limited human activities allowed
B. *P* - Protection of fauna only
Q - No human activities allowed
C. *P* - Private ownership is permitted
Q - Protection of both flora and fauna
D. *P* - Areas well demarcated into core, buffer and transition zones
Q - Areas around places of worship held in high esteem by tribal communities

30. Refer to the given flow chart and select the correct statement regarding it.



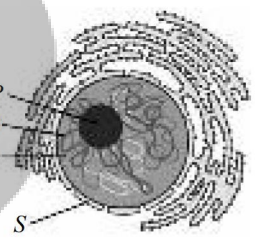
A. *W* causes typhoid in humans and leaf curl disease in plants.
B. *X* causes malaria in humans and yellow vein mosaic disease in plants.
C. *Y* causes athlete's foot in humans and late blight in potatoes.
D. *Z* causes leprosy in humans and citrus canker in plants.

31. Refer to the given relationships and select the option that correctly completes each one of them.

I.	Kanha National Park : Madhya Pradesh : *P*
II.	Kaundinya Wildlife Sanctuary : *Q* : Elephants
III.	*R* : Assam : One horned rhinoceros

	P	*Q*	*R*
A.	White tigers	Tamil Nadu	Sultanpur National Park
B.	Royal Bengal tigers	Andhra Pradesh	Kaziranga National Park
C.	White tigers	Odisha	Rann of kutch Sanctuary
D.	Royal Bengal tigers	Gujarat	Dachigam National Park

32. Refer to the given figure and select the incorrect statement regarding *P*, *Q*, *R* and *S*.



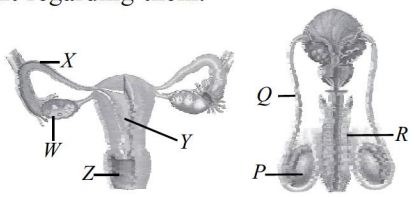
A. *P* is rich in RNA and proteins.
B. *Q* is rich in DNA and can occur in condensed form also.
C. *R* is opaque, semifluid substance that lacks proteins.
D. *S* is selectively permeable and separates *R* from cytoplasm.

33. In a village, farmers started using DDT as pesticide in their crop fields, located nearby river.
Given table shows the concentration of DDT as found in tissues of various organisms present in that river.

Organism	DDT concentration (ppm)
I	6
II	40
III	25
IV	60
V	12

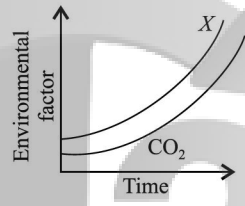
Which of the following option shows the correct order in which these organisms are linked in a food chain?
A. I → III → V → II → IV
B. I → V → III → II → IV
C. IV → II → III → V → I
D. II → IV → V → III → I

34. Refer to the given figures and select the incorrect statement regarding them.



A. *Z* is an organ that receives the sperm which fertilises ovum in *X*.
B. Secretions of both *Q* and *Y* help in development of male and female gametes, respectively.
C. Both *P* and *W* secrete hormones that control development of secondary sexual characters in males and females, respectively.
D. *R* is an erectile organ that releases its contents into *Z* which also serves as birth canal during parturition.

35. Refer to the given graph.
Which of the following could be *X*?



A. Temperature
B. Greenhouse effect
C. Sea level
D. All of these

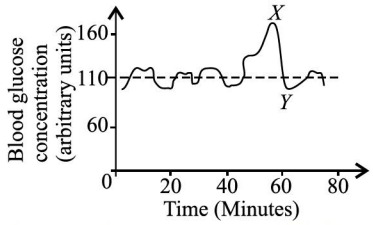
36. The given flow chart shows the sequence of various steps involved in crop production. Identify the missing steps and select the incorrect statements regarding them.

Preparation of soil → Sowing of seeds → Applying manure and fertilisers → [*P*] → [*Q*] → Protection from pest → [*R*] → [*S*] → [*T*] → Storage of grains

I. Process *P* helps in the intake of minerals by the plant.
II. Process *Q* can also be done before sowing of seeds.
III. Process *Q* is usually done manually using khurpi, etc. when performed after *P*.
IV. After *R*, the left over in the field can be used as manure by farmers.
V. *T* can be done using a thresher or a combine.

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

37. Refer to the given graph and select the correct option regarding it.



A. Liver is the main organ responsible for maintaining blood glucose concentration.
B. At point *X* adrenaline is secreted by pancreas.
C. At point *Y* insulin is secreted by pancreas.
D. Glucose concentration in blood keeps fluctuating throughout the day.

38. Refer to the given table and select the option that correctly identifies *W*, *X*, *Y* and *Z*.

S.No.	Microorganism	Role in nitrogen cycle
(i)	*Azotobacter*	*W*
(ii)	*X*	Conversion of nitrate to free nitrogen
(iii)	*Y*	Conversion of ammonia to nitrites
(iv)	*Nitrobacter*	*Z*

	W	*X*	*Y*	*Z*
A.	Ammonification	*Pseudomonas*	*Nitrosomonas*	Conversion of nitrites to nitrates
B.	Nitrogen fixation	*Thiobacillus*	*Nitrosomonas*	Conversion of nitrites to nitrates
C.	Denitrification	*Nitrosococcus*	*Rhizobium*	Conversion of nitrates to nitrites
D.	Ammonification	*Nitrosococcus*	*Rhizobium*	Conversion of nitrates to nitrites

39. Match the columns and select correct option from the given codes.

	Column I (Gland)		Column II (Hormone)		Column III (Function)
(a)	Pituitary	(i)	Thyroxine	(p)	Stimulates growth of the body
(b)	Thyroid	(ii)	Insulin	(q)	Development of breast
(c)	Ovary	(iii)	Growth hormone	(r)	Regulates sugar metabolism
(d)	Pancreas	(iv)	Testosterone	(s)	Development of secondary sexual characters in males
(e)	Testis	(v)	Oestrogen	(t)	Regulates growth and maintain basal metabolic rate

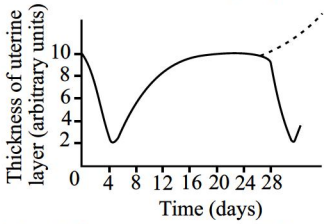
A. a-(iii)-(p); b-(i)-(t); c-(v)-(q); d-(ii)-(r); e-(iv)-(s)
B. a-(iv)-(p); b-(i)-(t); c-(v)-(r); d-(ii)-(q); e-(iii)-(s)
C. a-(i)-(t); b-(iii)-(p); c-(iv)-(r); d-(ii)-(q); e-(v)-(s)
D. a-(i)-(p); b-(iii)-(t); c-(v)-(q); d-(iv)-(s); e-(ii)-(r)

40. Read the given statements.
(i) A woman who is unable to produce ovum or has problems in the Fallopian tube making fertilisation difficult can opt for IVF.
(ii) Asexual reproduction is a rapid and easier method of multiplication.
(iii) Unicelled organisms reproducing by binary fission are referred to as 'immortals' because actual death of the parent does not occur.
(iv) Metamorphosis is the transformation of an adult animal to larval form.

Which of the given statements are correct?

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

41. Refer to the given graph showing thickness of the uterine layer of an adult woman during a period of time.



Which of the following occurs if the curve continues along the dotted line?

A. Corpus luteum has degenerated resulting in formation of blood clot.
B. An embryo has been embedded in the uterine layer.
C. The amount of menstrual flow has increased.
D. Two ova are simultaneously released from the ovary.

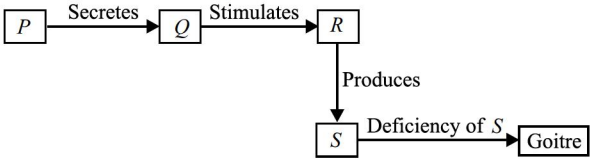
42. Read the given statements and select the correct option.

Statement 1 : An increase in the concentration of greenhouse gases in the atmosphere would cause more heat to be retained by the atmosphere leading to global warming.

Statement 2 : Greenhouse gases, *e.g.*, CO_2, CH_4 etc., reflect back the infrared radiations reflected by the earth's surface.

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 and statement 2 is false.
D. Statement 2 is true and statement 1 is false.

43. Identify *P*, *Q*, *R* and *S* in the given flow chart and select the correct option.



A. *P*-Pituitary gland, *Q*-Thyroid
B. *R*-Hypothalamus, *S*-Insulin
C. *P*-Hypothalamus, *R*-Adrenaline
D. *Q*-TSH, *S*-Thyroxine

44. The manufacture of bread, beer and wine involves alcoholic fermentation of glucose to ethanol by yeast. Which of the following statements concerning this process is incorrect?

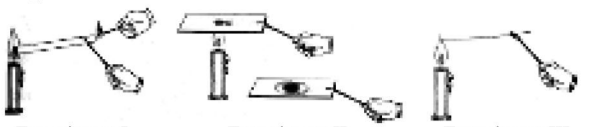
A. Yeast carries out fermentation because yeast cells lack mitochondria.
B. For every molecule of ethanol produced, one molecule of CO_2 evolves.
C. During fermentation by yeast, pyruvic acid is first converted to acetaldehyde which finally converts to ethanol.
D. Pyruvate decarboxylase and alcohol dehydrogenase play key role in this process.

45. Mrs. Mehra, who is 32 years old, underwent a surgery to get her oviducts removed after having girl. Now, she wants to have another baby. Do you think she can have another baby?

A. Yes, she can have another baby as her ovaries are still functional to produce eggs.
B. No, she cannot have another baby because fertilisation of egg takes place in the oviduct.
C. Yes, she can have another baby because the surgery can be reversed.
D. No, she cannot have another baby as the hormones associated with the oviduct will not be present.

ACHIEVERS SECTION

46. Ms. Abha, a science teacher demonstrated three experiments in lab as follows :



Experiment I (In dark zone) | Experiment II (In luminous zone) | Experiment III (In non-luminous zone)

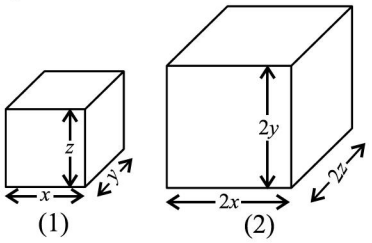
Experiment	Observation	Inference
Experiment I	Burning matchstick is extinguished	Carbon monoxide produced due to incomplete combustion burns to produce carbon dioxide which extinguishes the burning matchstick.
Experiment II	Formation of circular blackish ring	Luminous zone of flame contains unburnt carbon particles which get deposited on glass slide.
Experiment III	Copper wire becomes red hot	Non-luminous zone is the hottest part of flame due to complete combustion.

Which of the following observations and inferences drawn is/are correct?

A. I and II only
B. II and III only
C. III only
D. I only

Direction (Q. No 47 and 48) : Refer to the given passage and answer the following questions.

Two concrete rectangular blocks 1 and 2 have dimensions as shown in figures. Standing on one of its faces as shown, the pressure exerted by block 1 is P. Both the blocks are made of same material.



47. Find the value of P, if weight of the block 1 is 5 N, and the value of x, y and z are 2 cm, 6 cm and 8 cm respectively.

A. 3125 N m^{-2} B. 4167 N m^{-2}
C. 1389 N m^{-2} D. 1042 N m^{-2}

48. What is the pressure exerted by block 2 when it stands on the face as shown in figure ?

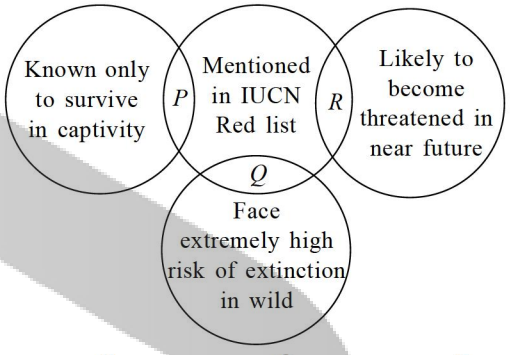
A. $\left(\frac{x}{2z}\right)P$ B. $\left(\frac{z}{x}\right)P$
C. $\left(\frac{x}{y}\right)P$ D. $\left(\frac{2y}{z}\right)P$

49. Refer to the given statements and select the option that corrects underlined word wherever necessary.

I. Endoplasmic reticulum is responsible for packaging and transporting products of glandular cells.
II. Vacuoles contain chemical substances that digest intra and extracellular materials.
III. Ribosomes are membranous structures found scattered in the cytoplasm of all cells.
IV. Mitochondria are absent in mature mammalian red blood cells.

A. Endoplasmic reticulum in I must be replaced by Golgi apparatus whereas membranous in III must be replaced by non-membranous.
B. Vacuoles in II must be replaced by Centrosomes whereas membranous in III should not be replaced as it is correctly mentioned.
C. Red blood cells in IV must be replaced by sperms.
D. Endoplasmic reticulum in I must be replaced by Peroxisome whereas Vacuoles in II must be replaced by Lysosomes.

50. Refer to the given Venn diagram and select the option that correctly identifies P, Q and R.



	P	*Q*	*R*
A.	Royal penguin	King cobra	Golden-headed langur
B.	Skunk frog	Giant panda	Assam rabbit
C.	Hawaiian crow	Bactrian camel	Blackbuck
D.	Chinese pangolin	Asiatic wild ass	Desert tree frog

SPACE FOR ROUGH WORK

CLASS24
ANSWER KEYS

14th NSO

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

15th NSO

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

16th NSO

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

17th NSO-Level 2 was an online exam. Hence, paper cannot be included in the booklet.

18th NSO

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

CLASS24

19th NSO

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

CLASS 8

LEVEL 2

QUESTION PAPER SET B

Techfest IIT Bombay

NSO

SOF NATIONAL SCIENCE OLYMPIAD 2018-19

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. ● Ⓑ Ⓒ Ⓓ

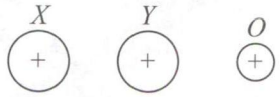
8. Rough work should be done in the blank space provided in this booklet.
9. Please fill in your personal details in the space provided on this page before attempting the paper.
10. **RETURN THE OMR SHEET AND QUESTION PAPER TO THE INVIGILATOR AT THE END OF THE EXAM.**

SOF
SCIENCE OLYMPIAD FOUNDATION
Inspiring Young Minds Through Knowledge Olympiads

Name:.....

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

1. The given figure shows a small positively charged sphere O, kept near two larger positively charged spheres X and Y which are fixed.



In which direction will the sphere O move?

A. Up B. Down
C. Left D. Right

2. Read the given statements carefully.

(i) Gymnasts apply some coarse substance on their hands.
(ii) Tying shoe laces.
(iii) Applying the brakes on a car.
(iv) Writing on the blackboard with a chalk.

In which of the following cases is the friction helpful?

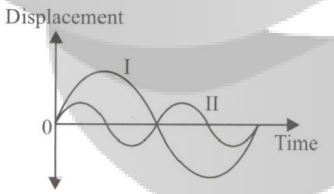
A. (i) and (ii) only B. (i), (ii) and (iii) only
C. (ii), (iii) and (iv) only D. (i), (ii), (iii) and (iv)

3. Which of the following statements is/are false?

I. Pressure in a liquid increases with depth, but at the given depth it is equal in all directions.
II. The pressure due to a fluid is independent of cross-sectional area of the fluid.
III. Atmospheric pressure increases as height above sea level increases.
IV. Upthrust on a floating block in a liquid is equal to the weight of liquid displaced by the block.

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

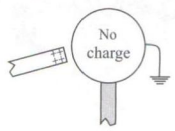
4. The displacement-time graph of two notes I and II are shown.

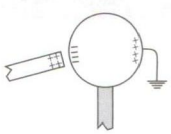


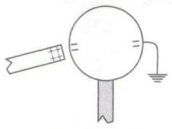
Which note has a higher frequency and which note has a lower wavelength?

	Higher frequency	Lower wavelength
A.	I	I
B.	I	II
C.	II	I
D.	II	II

5. A charged rod is held close to one side of a metal ball and the other side is earthed. Which diagram correctly shows the charge distribution?

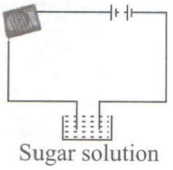
A. 

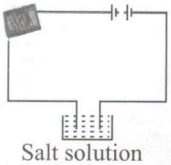
B. 

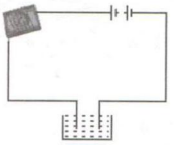
C. 

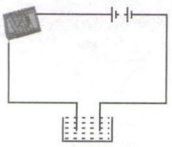
D. None of these

6. There are four circuit arrangements.

I. 
Sugar solution

II. 
Salt solution

III. 
Kerosene

IV. 
Distilled water

The compass needle(s) will show deflection in circuit(s)

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

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

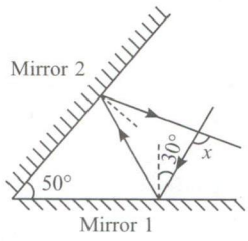
Statement 1 : When a guitar string is plucked lightly then it produces a feeble sound.
Statement 2 : Loudness of sound does not depend on the amplitude of vibrations of a vibrating object.

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.

8. An earthquake of magnitude 6 on Richter scale is how many times more destructive than an earthquake of magnitude 4?

A. 100 B. 1000
C. 1500 D. 2000

9. The diagram shows two plane mirrors inclined at an angle of 50° to each other. A ray is incident on mirror 1, then the deviation x (shown in the figure) of ray after two reflections is

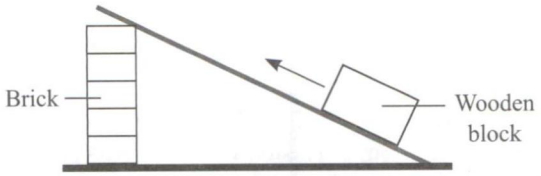


A. 50° B. 100°
C. 120° D. 150°

10. The wavelength of a certain sound wave is 110 m long. Given that the speed of sound in air is approximately 330 m s^{-1} and the audible range of a normal person is 20 Hz to 20000 Hz. An observer who is standing 220 m away from the source of this sound wave hears

A. A loud and high pitch sound
B. A soft and low pitch sound
C. Sound but its properties cannot be determined.
D. Nothing.

11. Richa conducted an experiment as shown in the figure to investigate how the height of the ramp affects the amount of force needed to move a wooden block up the ramp.



Which of the following variables must be kept the same to ensure that her experiment is fair?

I. Number of bricks
II. Material of the ramp
III. Size of the wooden block
IV. Mass of the wooden block

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

12. An object is accelerating under the influence of a force F_1 on a frictionless surface. A while later, an opposing force F_2 of the same magnitude acts on it as shown in the figure. What will happen to the object?

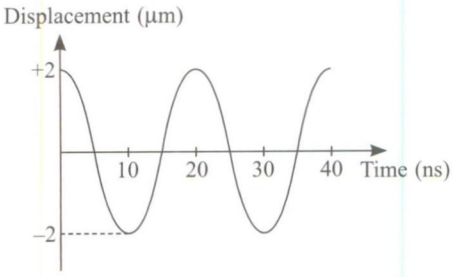
A. The object will slow down.
B. The object will move at constant velocity.
C. The object will come to rest immediately after the opposing force acts on it.
D. The object will move in the opposite direction.

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

	Column I		Column II
P.	A girl pulling the leash of a running dog	(i)	Impact of force can make stationary object to move
Q.	A driver turning the steering wheel of a car	(ii)	Gravity acts upon an object
R.	When you hit a nail with a hammer	(iii)	Force can make an object go slower
S.	A ball released from the top of a tower	(iv)	Force can change the direction of a moving object

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

14. The following figure shows the displacement of a particle within 40 ns. What will be the displacement of the particle when t = 70 ns?



A. –2 μm
B. 0 μm
C. 1 μm
D. 2 μm

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

Statement 1 : The conductivity of an electrolyte is very low as compared to a metal at room temperature.
Statement 2 : The density of free ions in electrolyte is much smaller than density of free electrons in metals.

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.

16. Which of the following statements is/are true?

I. A constellation has only 5-10 stars.
II. Aryabhatta was the first Indian satellite.
III. Artificial satellites are used for weather forecasting and remote sensing only.
IV. Venus is the brightest planet in the night sky.

A. II only
B. II and III only
C. II and IV only
D. IV only

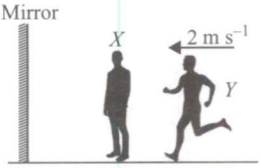
17. Match column I and column II and select the correct option from the given codes.

	Column I		Column II
P.	Electroscope	(i)	Conductor
Q.	Copper	(ii)	Lightning rods
R.	Spikes	(iii)	Ozone
S.	Lightning	(iv)	Charge

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

18. Man X is standing in front of a plane mirror while man Y is running towards him from behind. If the man Y is running at a speed of 2 m s^{-1}, how many metres nearer does the man Y seem to be away from man X after 5 seconds?

A. 30 m
B. 15 m
C. 10 m
D. 20 m



19. Two identical balls are dropped separately into two identical tubes. One of the tubes is filled with air and the other has its air pumped out with a vacuum pump. Which of the following observation(s) is/are true?

I. Both the balls will reach the bottom of the tube with same speed.
II. Both the balls will reach the bottom of the tube with different speed.
III. Both the balls will reach the bottom of the tube at the same time.

A. II only
B. I and II only
C. II and III only
D. None of these

20. Select the incorrect statements.

I. Coal is a mixture of chemical substances containing carbon, hydrogen, oxygen and small amount of nitrogen and sulphur.
II. Inexhaustible natural resources cannot be replenished continually.
III. When coal is heated in the absence of air, carbon monoxide is produced which is a poisonous gas.
IV. Coal is used as a source of energy in various industries like cement, paper, steel etc.

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

21. Match the columns and select the correct option from the given codes.

	Column-I		Column-II		Column-III
P.	Synthetic fibre which resembles silk in appearance	(i)	Acrylic	(a)	Bed linen
Q.	Synthetic fibre which resembles wool	(ii)	Spandex	(b)	Shawls and sweaters
R.	Soft, rubbery and highly elastic synthetic fibre	(iii)	Rayon	(c)	Fabrics
S.	Wrinkle resistant, light weight and elastic synthetic fibre	(iv)	Polyester	(d)	Swimming costumes

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

22. Shaheen tested the water absorption capacities of different fibres. She cut equal sized squares from three different fabrics and weighed them. She then placed each fabric square into a beaker containing water and again weighed the fabrics after 15 minutes. All her observations are summarised in the given table.

Fabric	Mass before soaking (g)	Mass after soaking (g)
W	23	29
X	32	43
Y	46	69

Fabrics *W*, *X* and *Y* could be respectively

A. Cotton, polyester, nylon
B. Cotton, nylon, wool
C. Wool, cotton, nylon
D. Nylon, cotton and wool.

23. Match the columns and select the correct option from the given codes.

	Column-I		Column-II
P.	The most abundant element in universe	(i)	Oxygen
Q.	Largest constituent of atmosphere	(ii)	Aluminium
R.	Most abundant non-metal in earth's crust	(iii)	Nitrogen
S.	Most abundant metal in earth's crust	(iv)	Hydrogen
		(v)	Iron

A. P – (iii), Q – (i), R – (iv), S – (v)
B. P – (iv), Q – (iii), R – (i), S – (v)
C. P – (iv), Q – (iii), R – (i), S – (ii)
D. P – (iii), Q – (iv), R – (i), S – (v)

24. Calorific values of four fuels *P*, *Q*, *R*, *S* and *T* is in the order, $T > R > Q > S > P$.

P, *Q*, *R*, *S* and *T* could be respectively

A. LPG, petrol, wood, cow dung cakes and hydrogen
B. Petrol, hydrogen, LPG, cow dung cakes and wood
C. Cow dung cakes, kerosene, LPG, wood and hydrogen
D. Petrol, LPG, hydrogen, wood and cow dung cakes.

25. A few processes are listed in the box.

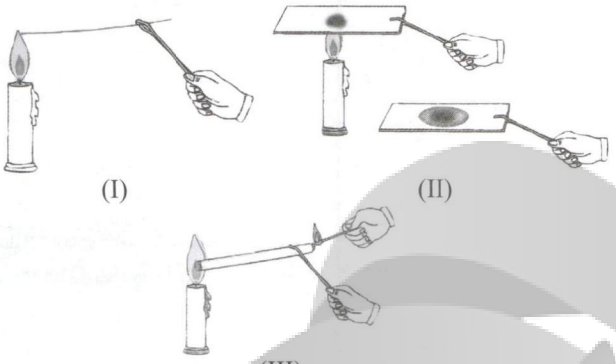
(i) Respiration
(ii) Burning of LPG in kitchen
(iii) Burning of candle
(iv) Rusting
(v) Burning of phosphorus
(vi) Burning of fire crackers
(vii) Burning of sodium

Which of the following is correct regarding these processes?

A. (i) and (iv) are examples of spontaneous combustion.

B. (ii) and (iii) are examples of rapid combustion.
C. (vi) and (vii) are examples of slow combustion.
D. (i) and (v) are examples of slow combustion.

26. Observe the given experimental set-ups carefully. In figure (I), a thin long copper wire is introduced into the non-luminous zone of a candle flame; in figure (II), a clear glass slide is introduced into the luminous zone while in figure (III), one end of a glass tube is introduced into the dark zone of a candle flame.



(I) (II)

(III)

Which of the following is incorrect regarding these experiments?

A. Copper wire in figure I will become red hot because outermost zone is the hottest part of flame.
B. Blackish ring will be formed on glass plate in figure II because of unburnt carbon particles in the middle zone of candle flame.
C. A flame is formed at the end of glass tube in figure III due to unburnt wax vapours in the innermost zone of candle flame.
D. None of these

27. Select the correct statements.

I. Teflon is used to make the windscreen wipers of cars because it has low friction.
II. Nylon is used to make ropes for rock climbing because it is very strong.
III. Bakelite is used for making electric plugs, switches etc. as it is a good conductor.
IV. Dusters made of nylon or other synthetic materials are good for use in kitchen as they are soft.
V. Blended fabrics are long lasting as they contain only synthetic fibres.

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

28. Select the correct statements.

I. Dry powder of chemicals like sodium bicarbonate or potassium bicarbonate when released near the fire, gives off CO_2.
II. Water should be used to extinguish fire caused by cooking oil.
III. When CO_2 stored in cylinders is sprayed on fire, it cuts off the supply of oxygen as well as brings down the temperature of the fuel.
IV. Sand can be used to extinguish fire caused by electrical equipments.

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

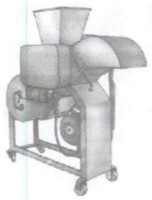
29. Select the incorrect match.

	Gas		Main components
A.	Coal gas	–	Hydrogen + Methane
B.	Natural gas	–	Methane
C.	Petroleum gas	–	Methane + Propane
D.	Biogas	–	Methane

30. Which of the following represents the correct decreasing order of boiling points of the given liquids?

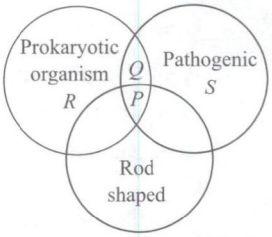
A. Paraffin wax > Diesel > Kerosene > Petrol
B. Diesel > Kerosene > Petrol > Paraffin wax
C. Kerosene > Petrol > Paraffin wax > Diesel
D. Petrol > Paraffin wax > Diesel > Kerosene

31. Identify the agricultural implement given in the figure and select the correct statement regarding it.



A. It is used for separating grain from the harvested crop.
B. It is used for separating grain from the chaff.
C. It is used for sowing seeds in the soil at an equal distance.
D. It is used for loosening and turning the soil for making it breathable for plants.

32. Refer to the given Venn diagram and select the incorrect statement regarding *P-S*.



A. *P* could be *Bacillus anthracis* that causes anthrax.
B. *Q* could be *Vibrio cholerae* that causes cholera in humans.
C. *R* could be *Chlamydomonas* that is distributed widely in fresh water.
D. *S* could be *Giardia* that causes intestinal infection in humans.

33. Identify processes *X* and *Y* from the given statements and select the option that correctly identifies the microorganisms involved in them respectively.

X : Conversion of complex organic compounds into ammonia
Y : Conversion of nitrates in soil to free nitrogen

	X	*Y*
A.	*Aspergillus*	*Bacillus*
B.	*Micrococcus*	*Thiobacillus*
C.	*Pseudomonas*	*Nitrocystis*
D.	*Bacillus*	*Pseudomonas*

34. '*X*' is a protected land area reserved for the conservation of wild animals and birds. Poaching and capturing of animals is strictly prohibited here. However, activities like harvesting of timber and collection of minor forest products is allowed. *X* could be

A. Mudumalai Wildlife Sanctuary, Tamil Nadu
B. Kanha National Park, Madhya Pradesh
C. Pachmarhi Biosphere Reserve, Uttar Pradesh
D. National Zoological Park, New Delhi.

35. Consider the following statements and select the option which correctly identifies true (T) and false (F) ones.

(i) Reproductive life of woman lasts from menarche to menopause.
(ii) In females, the uterus wall thickens to receive the embryo.
(iii) Estrogen is released by testes at the onset of puberty.
(iv) Hormones secreted by adrenal glands stimulate testes and ovaries to produce their hormones.

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

36. What path does a sperm take from where it is produced to where it would fertilise an egg?

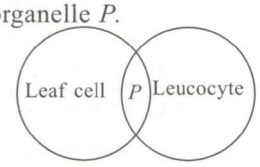
A. Testis→ Sperm duct→Urethra→Vagina→Oviduct
B. Testis→Urethra→Sperm duct→Vagina→Cervix
C. Prostate→Testis→Sperm duct→Vagina→Oviduct
D. Scrotum→Testis→Sperm duct→Uterus→Vagina

37. Which of the following options are not consequences of deforestation?

I. Reduced rainfall
II. Change in climate
III. Overgrazing by animals
IV. Volcanic eruptions
V. Imbalance of atmospheric gases

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

38. Refer to the given Venn diagram and select the option that correctly identifies cell organelle *P*.



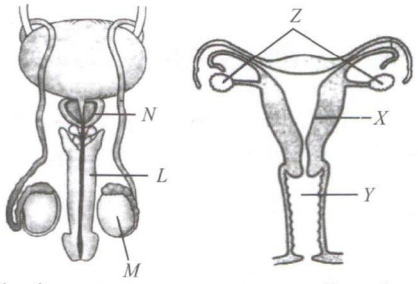
(i) Centrosome
(ii) Cell wall
(iii) Mitochondria
(iv) Golgi complex
(v) Chloroplast

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

39. Crop plants may be attacked by pests which affect the crop production. Fungi are such type of pests which cause diseases like

A. Smut of wheat
B. Citrus canker
C. Blight of potato
D. Both A and C.

40. Refer to the given figures of male and female reproductive systems.



Select the incorrect statement regarding them.

A. Both *M* and *Z* are primary sex organs in males and females respectively.
B. *L* helps to deliver male gamete in the *Y* of females.
C. Gamete released by *M* fertilises female gamete in *X*.
D. Both B and C

41. Untreated sewage is discharged into a river from nearby homes. Within few weeks, the number of fish in the river significantly falls. Which of the following could not have caused this phenomenon?

A. Algal blooms
B. Excessive bacterial growth
C. Overcrowding due to increasing fish populations
D. Increased levels of nitrates and phosphates

42. Geetanjali is a student of class VIII. One day her elder sister wrote the given statements regarding a cell organelle.

I. Bounded by single membrane
II. Filled with watery fluid
III. Helps in osmoregulation
IV. Stores metabolic by-products

She is referring to

A. Plastid
B. Vacuole
C. Mitochondria
D. Endoplasmic reticulum.

43. Read the given paragraph where few words have been italicised. Make changes (wherever necessary) and select the incorrect option.

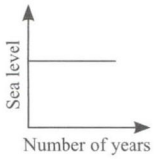
Dolly was developed from a cell taken from *mammary gland* of *Scottish black face ewe* and unfertilised egg cell of *Finn Dorsett sheep*. Both the cells were fused after removing the *plasma membrane* from the unfertilised egg cell. Embryo was then implanted into the uterus of the sheep from which unfertilised egg was taken. It developed into baby sheep Dolly.

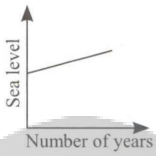
A. *Mammary gland* should not be changed as it is correctly mentioned.

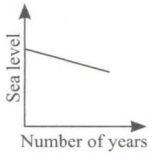
B. Position of *Scottish blackface ewe* and *Finn Dorsett sheep* should be interchanged.
C. *Plasma membrane* must be changed to *nucleus.*
D. None of these

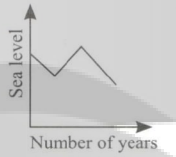
44. The given graphs show the change in global sea levels with respect to time.

Which of these graphs correctly depicts that deforestation has taken place over time?

A. 

B. 

C. 

D. 

45. Read the given statements about gaseous pollutants *P*, *Q*, *R* and *S* of air and select the option which correctly identifies them.

(i) *P* could be a gas produced due to biological degradation of organic matter present in sewage.
(ii) *Q* could be a gas that on combining with haemoglobin forms carboxyhaemoglobin.
(iii) *R* could be a gas that is released from refrigerators and air conditioners.
(iv) *S* and sulphur dioxide could be gases that are produced upon burning fossil fuels like petrol, coal, etc., and can cause acid rain.

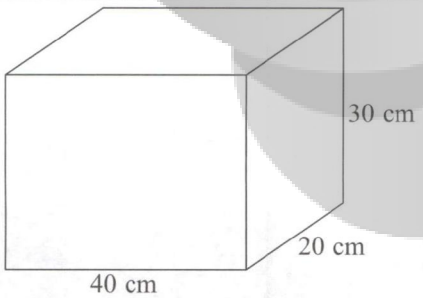
	P	*Q*	*R*	*S*
A.	CFC	Carbon dioxide	Sulphur dioxide	Carbon monoxide
B.	Ozone	Carbon monoxide	Nitrogen dioxide	CFC
C.	Carbon monoxide	Carbon dioxide	Ozone	Carbon dioxide
D.	Methane	Carbon monoxide	CFC	Nitrogen dioxide

ACHIEVERS SECTION

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

A cuboid rests on the floor. Data of the cuboid and some other parameters are given here.

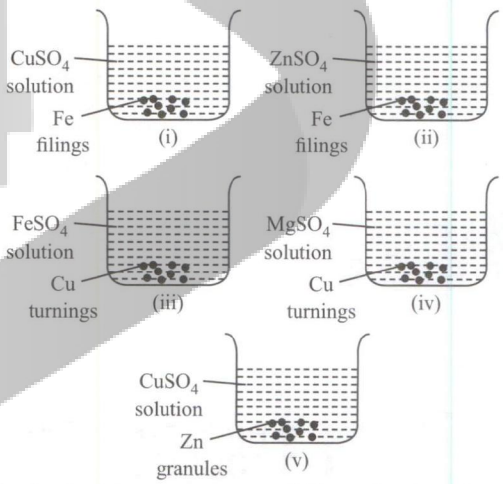
Length of cuboid	40 cm
Width of cuboid	20 cm
Height of cuboid	30 cm
Mass of the cuboid	60 kg
Acceleration due to gravity	10 N kg^{-1}



46. By rotating the cuboid, what is the minimum pressure it can exert on the floor?
A. 7500 Pa
B. 10000 Pa
C. 5000 Pa
D. 20000 Pa

47. By rotating the cuboid, what is the maximum pressure it can exert on the floor?
A. 3000 Pa
B. 7500 Pa
C. 5000 Pa
D. 10000 Pa

48. Five beakers are arranged as shown in the figure.

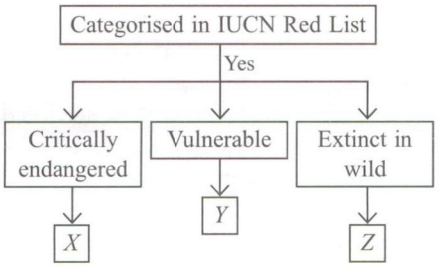


Study the given set-up carefully and select the correct statements.

I. Reaction will take place in beakers (ii) and (v).
II. A colour change will take place in beakers (i) and (v).
III. A white deposition will be formed on copper turnings in beaker (iv).
IV. A brown deposition will be formed on iron filings in beaker (i) and on zinc granules in beaker (v).
V. Reaction will take place in all the beakers but colour change will be observed only in beakers (i) and (iii).

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

49. Refer to the given flow chart and select the correct option regarding *X*, *Y* and *Z*.



	X	*Y*	*Z*
A.	Blackbuck	Asiatic golden cat	Salvin's curassow
B.	Asiatic wild ass	Passenger pigeon	Indian rhinoceros
C.	Ivory-billed woodpecker	Indian rhinoceros	Alagoas curassow
D.	Asiatic lion	Chinkara	Lion-tailed macaque

50. Given below is a list of organelles present in a cell.

1. Cell wall
2. Chloroplast
3. Ribosome
4. Vacuoles
5. Mitochondria
6. Peroxisome
7. Cell membrane
8. Nucleus

Identify the option that correctly matches description of cell to its missing cell organelle.

	Description of cell	**Missing cell organelle**
(a)	Cell is unable to synthesise protein	*L*
(b)	Cell has no control over its activities	*M*
(c)	Cell is unable to remove toxic substances from itself	*N*
(d)	Cell is unable to control substances that passes in and out of it	*O*

	L	*M*	*N*	*O*
A.	6	2	3	1
B.	3	8	6	7
C.	5	7	4	6
D.	2	4	7	8

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CLASS24

CLASS - VIII | **2018-19**

NSO (LEVEL-II) **ANSWER KEY**

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