

9
CLASS

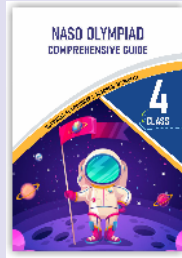
MOCK TEST SERIES



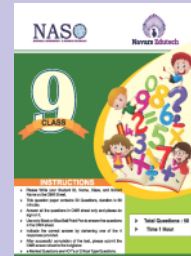
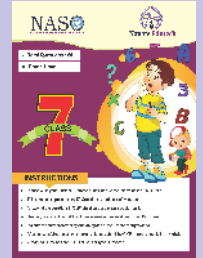
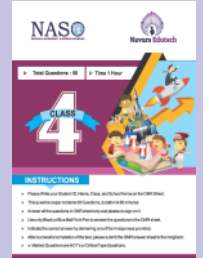
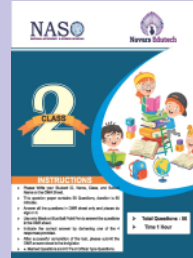
- ♦ All the questions are in MCQ format.
- ♦ In-depth analysis of each topic, followed by relevant practical and illustrative examples, with MCQ based Questions.
- ♦ Comprising questions prepared by teachers from various schools of India and abroad.
- ♦ Comprising questions of various National and International Olympiads.
- ♦ Model Test Papers with Answer Key.
- ♦ Special emphasis on concepts building and improving problem solving skills.

- ♦ **National Olympiad's**
- ♦ **Quizzes**
- ♦ **International Olympiad's**

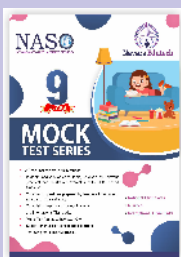
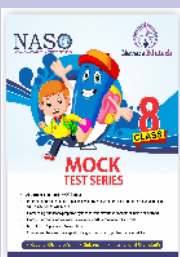
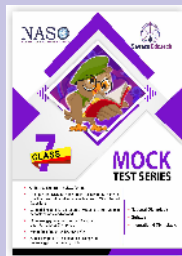
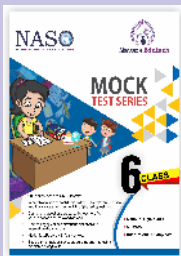
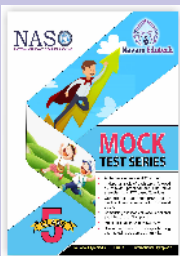
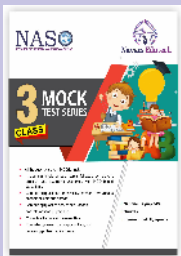
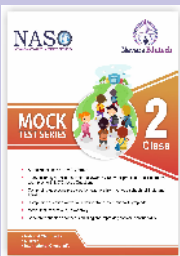
NASO OLYMPIAD COMPREHENSIVE GUIDE



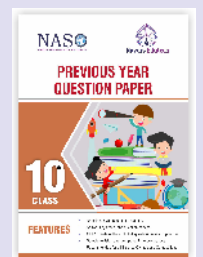
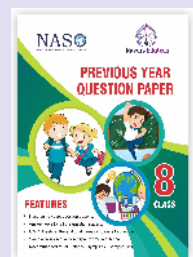
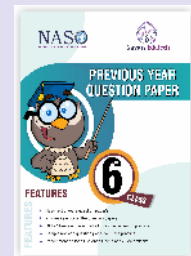
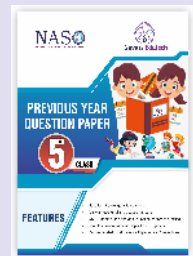
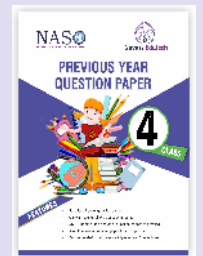
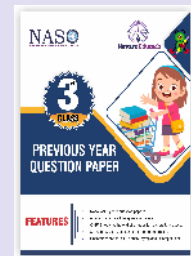
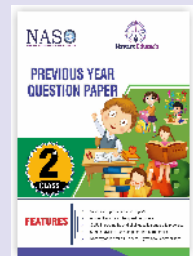
NASO QUESTION PAPER 2018



NASO MOCK TEST SERIES



NASO PREVIOUS YEAR QUESTION PAPER



NASO WORKBOOK



SMART BAIN IQ PUZZLE

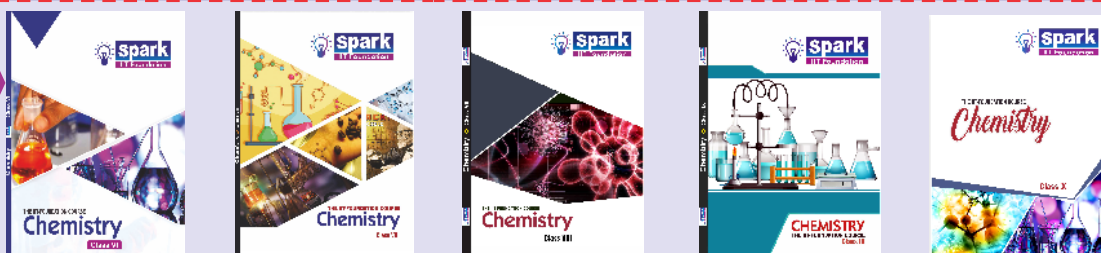


NASO EXCELLENCE GUIDE

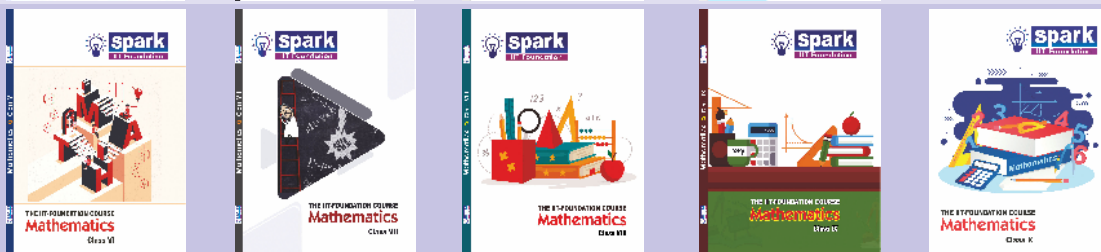


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- 1 Match column I with column II and select the correct from the codes given below.

Column I	Column II
A. Catla catla	(i) 
B. Common carp	(ii) 
C. Grass carp	(iii) 
D. Silver carp	(iv) 

Option	Column-A	Column-B	Column-C	Column-D
A	(i)	(ii)	(iii)	(iv)
B	(ii)	(iii)	(iv)	(i)
C	(iv)	(iii)	(ii)	(i)
D	(ii)	(iii)	(i)	(iv)

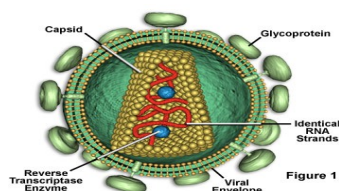
2. It is a type of cropping pattern which makes better use of the natural resources of sunlight, land and water and ensures maximum utilization of the nutrients supplied, as crops growing in definite row pattern have different nutrient requirements. Identify it
- A. Mixed cropping B. Intercropping
C. Crop rotation D. Norfolk rotation
3. Which of the following are the characteristics of an essential plant nutrient?
- (i) It must have a direct influence on the plant nutrition and metabolism.
(ii) Its deficiency can be corrected by supplying some alternative nutrient.
(iii) It makes plant able to complete its life cycle.
(iv) The requirement of the element must be specific
- A. (i), (ii) & (iii) B. (ii) & (iii) C. (i), (iii) & (iv) D. (iii) & (iv)

4. The given figure shows the position of peptic ulcers. These ulcers cause acidity- related pain and bleeding. Identify the names of these ulcers from the codes given below.

Option	Column-P	Column-Q	Column-R
A	Esophageal	Gastric	Duodenal
B	Gastric	Gastric	Gastric
C	Duodenal	Esophageal	Gastric
D	Duodenal	Gastric	Esophageal

5. The given figure is the structure of the causal organism of which disease?

- A. Hepatitis B
B. AIDS
C. Polio
D. Flu



6. Read the given statements and mark the correct option.

Statement 1: Sound waves do not travel through vacuum.

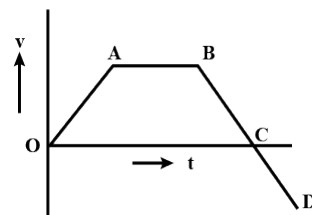
Statement 2: The speed of sound is too small when compared to speed of light

- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1
B. Both statement 1 & statement 2 are true and statement 2 is not the correct explanation of statement 2
C. Statement 1 is true but statement 2 is false
D. Both statement 1 and statement 2 are false
7. Which of the following statements is/are correct?
(i) The distance between two consecutive compressions is called frequency of sound wave.
(ii) Sound propagates as pressure variations
(iii) Compressions are narrower in a high pitched sound

- A. (i) only B. (ii) only C. (iii) only D. (ii) & (iii)

8. A plot of velocity versus time is shown in figure. A single force acts on the body. The correct statement is__?

- A. In moving from C to D, work done by the force on the body is positive
B. In moving from B to C, work done by the force on the body is positive
C. In moving from A to B, the body does work on the system
D. In moving from 0 to A, work is done by the body and is negative

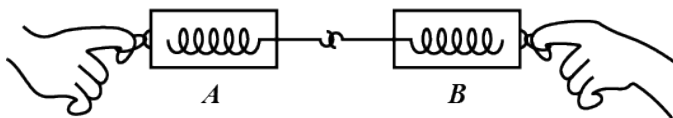


9. A rocket of mass 3×10^6 kg takes off from a launching pad and acquires a vertical velocity of 1 km s^{-1} at an altitude of 25 km. The potential energy of the rocket is__?

- A. $7.5 \times 10^{11} \text{ J}$ B. $2.5 \times 10^{11} \text{ J}$ C. $7.5 \times 10^{10} \text{ J}$ D. $5.5 \times 10^{11} \text{ J}$

10. Consider two spring balances hooked as shown in the figure. We pull them in opposite directions. If the reading shown by A is 1.5 N, the reading shown by B will be___?

- A. 1.5 N
B. 2.5 N
C. 3.0 N
D. Zero



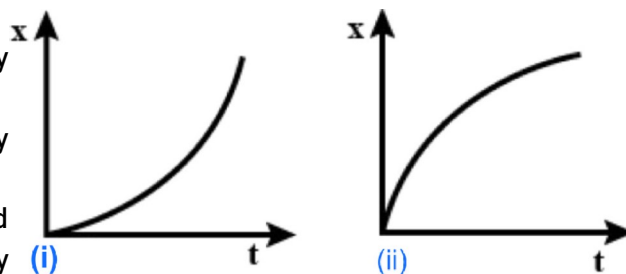
11. Read the passage carefully and answer___?

An 8000 kg engine pulls a train of 5 wagons, each of 2000 kg, along a horizontal track. If the engine exerts a force of 40000 N and the track offers a frictional force of 5000 N. The acceleration of the train is

- A. 2.5 m/s^2
B. 4.5 m/s^2
C. 3.5 m/s^2
D. 5.5 m/s^2

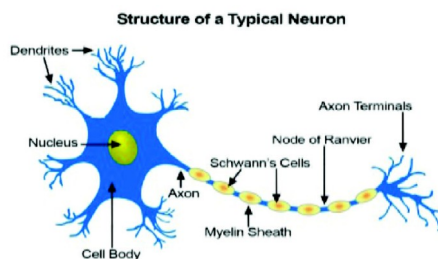
12. Figures (i) and (ii) below show the displacement-time graphs of two particles moving along the x-axis. We can say that ___?

- A. Both the particles are having a uniformly accelerated motion
B. Both the particles are having a uniformly retarded motion
C. Particle (i) is having a uniformly accelerated motion while particle (ii) is having a uniformly retarded motion
D. Particle (i) is having a uniformly retarded motion while particle (ii) is having a uniformly accelerated motion.

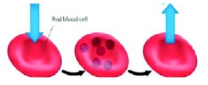
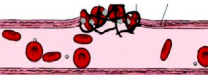
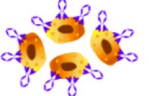


13. Which of following parts in the given figure are labeled incorrectly?

- A. Branches & node of Ranvier
B. Neurilemma & medullary sheath
C. Axon & terminal branches
D. Node of Ranvier & neurilemma



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

Column I	Column II
	(i) Produce antibodies
	(ii) Blood clotting
	(iii) Transport of oxygen

Option	Column-A	Column-B	Column-C
A	(i)	(ii)	(iii)
B	(ii)	(iii)	(i)
C	(i)	(iii)	(ii)
D	(iii)	(i)	(ii)

15. The matrix of bone is in the form of thin concentric rings, called _____. Bone cells, called _____ are present in fluid-filled spaces called _____. These fluid-filled spaces of the bone communicate with each other by network of fine canals, called _____. Complete the above paragraph by selecting the correct sequence of words from the following?

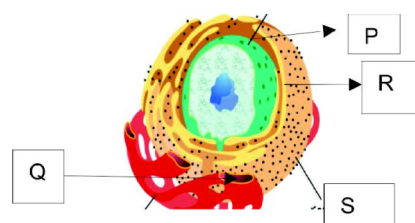
- A. Lacunae, osteoblasts, lamellae, canaliculi
- B. Lamellae, osteocytes, lacunae, canaliculi
- C. Lamellae, chondrocytes, canaliculi, lacunae
- D. Lacunae, adipocytes, lacunae, sarcoplasm

16. Which of the following differences between RER and SER is incorrect?

- A. RER = It mainly consists of cisternae
SER = It consists mainly of tubules and vesicles
- B. RER = It has ribosomes attached on its cytoplasmic surface
SER = It is free of ribosomes
- C. RER = It is well developed in cells specialized to synthesize lipids and steroids
SER = It is well developed in cells specialized to synthesize proteins
- D. RER = The products pass into the lumen of endoplasmic reticulum for transport to other places
SER = The products do not pass into the lumen of endoplasmic reticulum

17. The given figure shows a cell in which different cell organelles are labeled as P, Q, R and S. Identify the correct labeling?

Option	Column-P	Column-Q	Column-R	Column-S
A	Chloroplast	Mitochondria	Golgi apparatus	Plasma membrane
B	Vacuole	Mitochondria	ER	Plasma membrane
C	Chloroplast	Mitochondria	Golgi apparatus	Cell wall
D	Chloroplast	Mitochondria	ER	Cell wall



18. Read the given statements and mark the correct option.

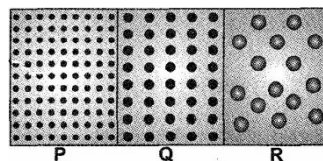
Statement 1: Isobars are identical in chemical properties.

Statement 2: Isobars have same atomic number

- 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.

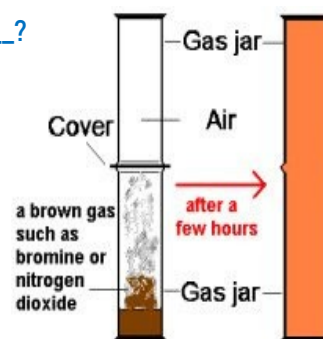
19. Types of solutions in boxes P, Q and R are___?

Option	Column-P	Column-Q	Column-R
A	Suspension	Colloidal	Solution
B	Solution	Colloidal	Suspension
C	Solution	Suspension	Colloidal
D	Suspension	Solution	Colloidal



20. If we remove the glass plate, the process taking place is___?

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



ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	B	B	C	D	B	B	D	A	B	A
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	C	C	A	D	B	C	C	D	B	C

ANSWER SHEET
National Astronomy & Science Olympiad

Filling of all columns completely & accurately is important.

Candidate's Name

[illegible]

INSTRUCTIONS FOR FILLING THE SHEET

1. This sheet should not be folded or crushed.
2. Use only blue/black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS



CORRECT METHOD



Grade

2nd 3rd 4th 5th 6th 7th 8th 9th 10th

Gender

Male ☐

Female ☐

RollNo.

[illegible]

Father's Name

[illegible]

School Name

[illegible]

E-mail Id

[illegible]

City

[illegible]

School Code

1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
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MARK YOUR ANSWERS HERE

A B C D				A B C D				A B C D				A B C D							
1	☐	☐	☐	☐	6	☐	☐	☐	☐	11	☐	☐	☐	☐	16	☐	☐	☐	☐
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3	☐	☐	☐	☐	8	☐	☐	☐	☐	13	☐	☐	☐	☐	18	☐	☐	☐	☐
4	☐	☐	☐	☐	9	☐	☐	☐	☐	14	☐	☐	☐	☐	19	☐	☐	☐	☐
5	☐	☐	☐	☐	10	☐	☐	☐	☐	15	☐	☐	☐	☐	20	☐	☐	☐	☐

Mobile No.[illegible]

Candidate's Signature

Invigilator's Signature

1. Match column I with column II and select the correct answer from the codes given below.

Column I	Column II
(a) Green revolution	(i) Milk
(b) Blue revolution	(ii) Oil
(c) White revolution	(iii) Food grains
(d) Yellow revolution	(iv) Pulse
(e) Silver revolution	(v) Fish

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(iii)	(i)	(vi)	(ii)	(iv)
B	(iii)	(ii)	(i)	(iv)	(v)
C	(iv)	(v)	(vi)	(ii)	(ii)
D	(iii)	(v)	(i)	(ii)	(vi)

2. Find out the correct sentences_____?

- (i) Hybridization means crossing between genetically dissimilar plants.
- (ii) Cross between two varieties is called as inter-specific hybridization.
- (iii) Introducing genes of desired character into a plant gives genetically modified crop
- (iv) Cross between plants of two species is called as inter-varietal hybridization

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

3. Earth's atmosphere acts as a protective blanket for the organisms to exist. Which of the following statements are true regarding its protective act?

- A. It keeps the average temperature of the earth fairly steady during the day and
- B. Even the whole year Its ozone shield absorbs most of the harmful UV radiations
- C. Coming from the sun both (A) & (B)
- D. None of the above.

4. Some of the terms are missing in the following table. Complete the table by selecting the correct option from the codes given below____?

Disease	Target organ
(a) SARS	Lungs
(b) Leishmani	Spleen and bone marrow
(c) Acne	skin
(d) Sleeping sickness	Trypanosoma

Option	Column-A	Column-B	Column-C	Column-D
A	Ribovirus	Hepatitis	Salmonella	Liver
B	Coronavirus	Kalaazar	Staphylococci	Brain
C	Adenovirus	Jaundice	Staphylococci	Spleen
D	Coronavirus	Pneumonia	Ascaris	Brain

5. Match column I with column II and mark the correct option from the codes given below____?

Column I	Column II	Option	Column-A	Column-B	Column-C	Column-D
(a) String vibration	(i) Tabla	A	(i)	(iv)	(ii)	(iii)
(b) Membrane vibration	(ii) Bicycle bell	B	(iii)	(i)	(iv)	(ii)
(c) Vibration of air	(iii) Sitar	C	(iv)	(ii)	(iii)	(i)
(d) Vibration of plate	(iv) Flute	D	(ii)	(iii)	(i)	(iv)

6. Read the given statements and mark the correct option.

Statement 1: Echo is produced only when sound is incident on hard and polished surface.

Statement 2: Sound energy can be totally reflected by objects with h soft and loose texture

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

7. Match column I with column II and mark the correct option from the odds given below.

Column I	Column II
(a) Audible range	(i) Faster transmission of sound
(b) Infrasonic range	(ii) Slower transmission of sound
(c) Ultrasonic range	(iii) Less than 20 Hz
(d) Denser medium	(iv) 20 Hz - 20 kHz
(e) Rarer medium	(v) More than 20 kHz

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(i)	(ii)	(iv)	(iii)	(v)
B	(iv)	(iii)	(v)	(i)	(ii)
C	(iii)	(v)	(i)	(ii)	(iv)
D	(v)	(i)	(ii)	(iv)	(iii)

8. A person A does 500 J of work in 10 minutes and another person B does 600 J of work in 20 minutes. Let the power delivered by A and B be P_1 and P_2 respectively. Then____?

A. $P_1=P_2$ B. $P_1>P_2$ C. $P_1<P_2$ D. P_1 and P_2 are undefined.

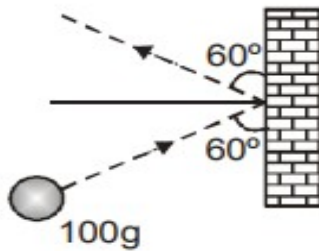
9. Read the passage carefully and answer__?

A car of mass 2,000 kg is lifted up a distance of 30 m by a crane in 1 minute. A second crane does the same job in two minutes. The power supplied by first crane is_____?

A. 4800W B. 9800W C. 19.6kW D. 980W

10. A mass of 100 g strikes the wall with speed 5 m/s at an angle as shown in figure and it rebounds with the same speed. If the contact time is 2×10^{-4} sec, what is the force applied by the wall?

A. $250\sqrt{3}$ N to right
B. 250 N to right
C. $250\sqrt{3}$ N to right
D. 250 N to left



11. Read the passage carefully and answer____?

An 8000 kg engine pulls a train of 5 wagons, each of 2000 kg, along a horizontal track. If the engine exerts a force of 40000 N and the track offers a frictional force of 5000 N. The force of wagon 1 on wagon 2 is?

A. 28000 N B. 18000 N C. 10000 N D. 20000 N

12. These animals are cold-blooded, have scales and breathe through lungs. They have four-chambered heart. They lay eggs with tough covering and do not need to lay their eggs in water. Which of the following animals is referred to in the above paragraph?

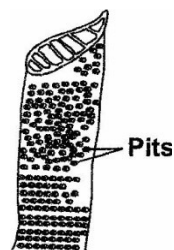


13. All the following divisions given in column I relate to specific example given in column II. Match column I and II and select the correct answer from the codes given below.

Column I	Column II
(a) Thallophyta	(i) Marsilea
(b) Bryophyta	(ii) Pinus
(c) Pteridophyta	(iii) Ulothrix
(d) Gymnospermae	(iv) Ficus
(e) Angiospermae	(v) Funaria

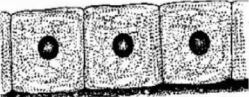
Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(iii)	(ii)	(i)	(iv)	(v)
B	(i)	(ii)	(iii)	(iv)	(v)
C	(i)	(v)	(iii)	(ii)	(iv)
D	(iii)	(v)	(i)	(ii)	(iv)

14. Identify the tubular structure shown in the given figure which is formed by a row of cells placed end to end and serves as a conducting tissue?



- A. Tracheid
- B. Vessel
- C. Xylem parenchyma
- D. Phloem parenchyma

15. Match column I with column II and select the correct answer from the codes given below?

Column I	Column II
(i) 	A. Intestine
(ii) 	B. Skin
(iii) 	C. Oesophagus
(iv) 	D. Kidney tubules

Option	Column-A	Column-B	Column-C	Column-D
A	(iii)	(iv)	(i)	(ii)
B	(iii)	(iv)	(ii)	(i)
C	(i)	(ii)	(iii)	(iv)
D	(i)	(ii)	(iv)	(iii)

16. Read the following passage and answer ____?

Water gas is an equimolar mixture of hydrogen and carbon monoxide. If 250 litres of water gas is burnt in air, calculate the following assuming both reactants and products are at same temperature and pressure. $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$; $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ Volume of steam produced

- A. 62.5 litres
- B. 250 litres
- C. 125 litres
- D. 375 litres

17. The boiling points of some gases found in air are given below ____?

Name	Boiling point °C
Krypton	-152
Neon	-246
Nitrogen	-196
Oxygen	-183

If liquid mixture is fractionally distilled, the order of gases distilling out is?

- A. Krypton, neon, nitrogen, oxygen
- B. Neon, nitrogen, oxygen, krypton
- C. Nitrogen, neon, oxygen, krypton
- D. Oxygen, neon, nitrogen, krypton

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

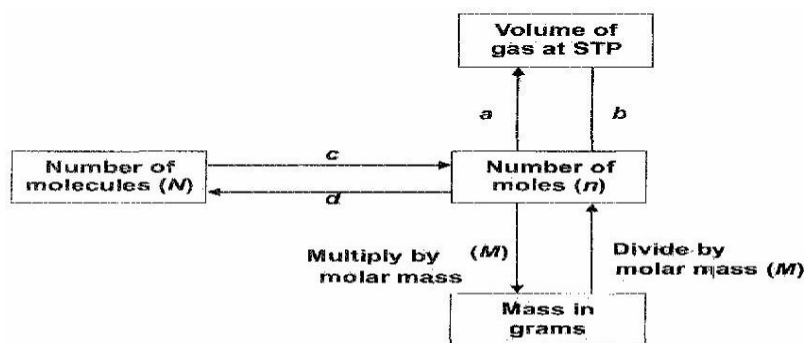
Column I	Column II
(a) Liquid	(i) Highly compressible
(b) Gas	(ii) Definite volume
(c) Plasma	(iii) Super low density
(d) Bose-Einstein condensate	(iv) Super energetic

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

19. Take a clean glass slide and put few drops of water on it. Now place a complete Rheo leaf in water and examine the cells of leaf under the high power of compound microscope. Put a few drops of concentrated salt/sugar solution on the mounted Rheo leaf on the glass slide. Wait for few minutes and again observe the leaf under the high power of microscope. What will be your observation after few minutes?

- A. Cell contents are separated from the cell wall
 B. Cytoplasm along with plasma membrane has come to lie on one side of cell wall in the leaf cells
 C. A clear space is seen between the cell wall and protoplast of the cells
 D. All of the above

20. Observe the flow chart and answer What are c and d?



- A. c = multiply by NA, d = divide by NA
 B. c = multiply by NA, d = multiply by NA
 C. c = divide by NA, d = multiply by NA
 D. c = divide by NA, d = divide by NA

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	D	A	C	B	B	C	A	B	B	C
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	A	C	B	B	A	C	B	C	D	A

Invigilator's Signature

1. Match column I with column II and select the correct option from the codes given below____?

Column I	Column II
(a) <i>Apis indica</i>	(i) Little bee
(b) <i>Apis dorsata</i>	(ii) Indian bee
(c) <i>Apis florea</i>	(iii) Rock bee
(d) <i>Apis mellifera</i>	(iv) Italian bee

Option	Column-A	Column-B	Column-C	Column-D
A	(i)	(ii)	(iii)	(iv)
B	(ii)	(iii)	(i)	(iv)
C	(ii)	(iv)	(iii)	(i)
D	(ii)	(iv)	(i)	(iii)

2. Their meat is tough and they give little milk. Hence they are used to insted of burden in various agricultural practices. These are called

- A. Milch animals B. Draught animals
C. Dual purpose animals D. None of these

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

Column I	Column II
(a) Particulate matter	(i) Chemical water pollutants
(b) Oil spills	(ii) Non-degradable soil pollutants
(c) Detergents	(iii) Degradable soil pollutants
(d) Plastics	(iv) Air pollutants
(e) Domestic wastes	(v) Physical water pollutants

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(iv)	(iii)	(i)	(ii)	(v)
B	(iv)	(v)	(i)	(ii)	(iii)
C	(i)	(ii)	(iii)	(iv)	(v)
D	(i)	(ii)	(iii)	(v)	(iv)

4. The given figure shows an organism which is___?

- A. Kala-azar
- B. Acne
- C. Sleeping sickness
- D. AIDS

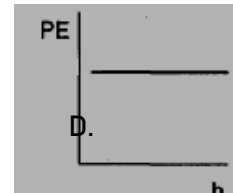
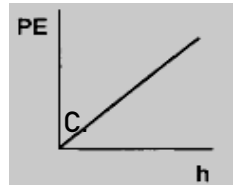
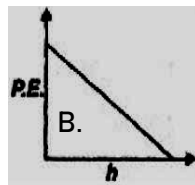
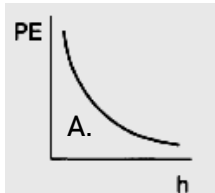


5. Read the passage carefully and answer

Two tuning forks, A and B vibrate with frequencies in the ratio 2 : 7 and their wavelengths in the ratio 3 : 4 respectively. Find the tuning fork producing greater velocity of sound___?

- A. Tuning fork A
- B. Tuning fork B
- C. Both produce same velocity
- D. Can't say.

6. Which of the following cases shows the true graph, when body falls from a height?



7. Read the passage carefully and answer?

A car of mass 2,000 kg is lifted up a distance of 30 m by a crane in 1 minute. A second crane does the same job in two minutes. The work done by two cranes are___?

- A. $5.88 \times 10^5 \text{ J}$, $5.88 \times 10^5 \text{ J}$
- B. $5.88 \times 10^5 \text{ J}$, $2.94 \times 10^5 \text{ J}$
- C. $2.94 \times 10^5 \text{ J}$, $2.94 \times 10^5 \text{ J}$
- D. $1.076 \times 10^6 \text{ J}$, $5.88 \times 10^5 \text{ J}$

8. The relation between the weight of an object on the moon (w_m) and on the earth (w_e) is___?

- A. $w_m = \frac{1}{6} w_e$
- B. $w_m = w_e$
- C. $w_m = \frac{1}{6} w_m$
- D. $w_m = 6 w_e$

9. A coil of wire of cross-section 0.75 mm^2 weighs 125 g in air and 115 g in water. The length of the coil in cm is___?

- A. $\frac{10^2}{0.75} \text{ cm}$
- B. $\frac{10^5}{0.75} \text{ cm}$
- C. $\frac{10^5}{0.75} \text{ cm}$
- D. $\frac{10^3}{0.75} \text{ cm}$

10. Match column I with column II and select the correct option from the codes given below___?

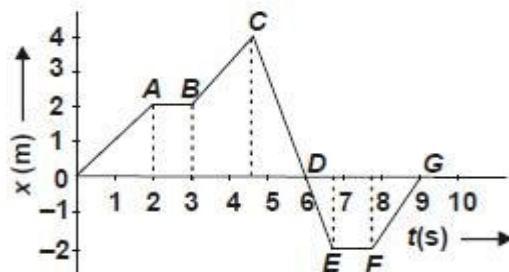
Column I	Column II
(a) Momentum	(i) ms^{-2}
(b) Pressure	(ii) Pascal
(c) Acceleration	(iii) kg ms^{-1}
(d) Force	(iv) Newton

Option	Column-A	Column-B	Column-C	Column-D
A	(iii)	(ii)	(i)	(iv)
B	(ii)	(iii)	(i)	(iv)
C	(iv)	(ii)	(iii)	(i)
D	(i)	(ii)	(iii)	(iv)

11. Read the passage carefully and answer.

A dancer demonstrating dance steps along a straight line. The position time graph is given below. The average velocity of the dancer during time interval between $t = 4.5 \text{ s}$ to $t = 9 \text{ s}$ is___?

- A. 1 ms^{-1}
 B. -1.33 ms^{-1}
 C. 2.75 ms^{-1}
 D. -0.89 ms^{-1}



12. Match column I with column II and select the correct answer from the codes given below___?

Column I	Column II
(a) Sea anemone	(i) Nematode
(b) Tape worm	(ii) Annelid a
(c) Round worm	(iii) Mollusk
(d) Earthworm	(iv) Platy helminthes
(e) Starfish	(v) Cnidarians
	(vi) Echinodermata

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(v)	(i)	(iv)	(ii)	(vi)
B	(v)	(vi)	(i)	(ii)	(iv)
C	(ii)	(vi)	(iv)	(i)	(v)
D	(ii)	(iv)	(v)	(vi)	(i)

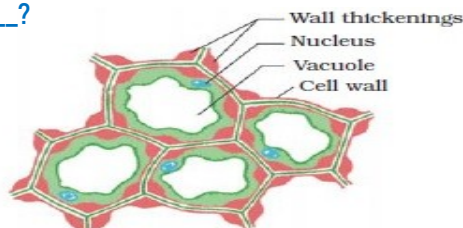
13. The given figure shows nitrogen fixing filamentous organism that lives freely in water and in moist habitats. Select the category to which it belongs___?

- A. Monera
 B. Protista
 C. Fungi
 D. Plantae



14. The given figure shows a type of permanent tissue in which cells are living, elongated and irregularly thickened at the corners. Identify it___?

- A. Parenchyma
- B. Collenchyma
- C. Sclerenchyma
- D. Xylem parenchyma



15. Which of the following statements are true?

- (i) Tendons join skeletal muscles to bones.
- (ii) Tendons are very elastic.
- (iii) Ligaments connect bones to bones.
- (iv) Ligaments are very elastic.

Sprain is caused by excessive pulling of tendons only ___?

- A. (i), (ii) & (iii)
- B. (i), (iii) & (iv)
- C. (ii) & (v)
- D. (i), (iv) & (v)

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

Statement 1 : In humans the gamete contributed by the male determines whether the child produced will be male or female.

Statement 2: Sex in humans is dependent upon X-chromosome or Y-chromosome of the father___?

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

Column I	Column II
(a) Leeuwenhoek	(i) Bacteria
(b) Robert Brown	(ii) Cell
(c) Robert Hooke	(iii) Nucleus
(c) Robert Hooke	(iv) Electron microscope
(e) Knoll and Ruska	(v) Compound microscope
	(vi) Protoplasm

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

18. Match column I with column II and select the correct option from the codes given below___?

Column I	Column II
(a) Avogadro number	(i) 63
(b) Molar volume	(ii) C ₆ H ₁₂ O ₆
(c) Nitrogen element	(iii) 22,400 cm ³
(d) Formula of glucose	(iv) 6.022×10^{23}
(e) Molecular weight of nitric acid	(v) Diatomic

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

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

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

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

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

Column I	Column II
(a) Sublimation	(i) Separation of water and CCl ₄
(b) Magnetic separation	(ii) Separation of NaCl from KNO ₃
(c) Gravity method	(iii) Separation of sand and wax
(d) Separating funnel	(iv) Separation of iron and sand
(e) Fractional crystallisation	(v) Separation of iodine and sand

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

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

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

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

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

Column I	Column II
(a) Liquid	(i) Highly compressible
(b) Gas	(ii) Definite volume
(c) Plasma	(iii) Super low density
(d) Bose-Einstein condensate	(iv) Super energetic

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

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

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

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

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	B	B	B	C	B	B	A	A	C	A
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	D	B	A	B	B	B	B	B	B	C

ANSWER SHEET
National Astronomy & Science Olympiad

Filling of all columns completely & accurately is important.

Candidate's Name

[illegible]

INSTRUCTIONS FOR FILLING THE SHEET

1. This sheet should not be folded or crushed.
2. Use only blue/black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS

CORRECT METHOD



Grade

Gender

2nd 3rd 4th 5th 6th 7th 8th 9th 10th

Male ☐

Female ☐

RollNo.

[illegible]

Father's Name

[illegible]

School Name

[illegible]

E-mail Id

[illegible]

City

[illegible]**School Code**

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1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9
0	0	0	0	0	0	0

MARK YOUR ANSWERS HERE

A B C D

A B C D

A B C D

A B C D

1					6					11					16				
2					7					12					17				
3					8					13					18				
4					9					14					19				
5					10					15					20				

Mobile No.

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[illegible]

Candidate's Signature

Invigilator's Signature

1. Read the given examples carefully and select those which belong to poultry_____?

(i)	Turkey
(ii)	Prawns
(iii)	Crabs
(iv)	Ducks
(v)	Cow
(vi)	Fowl
(vii)	Eel

- A. (i), (ii), (iii) & (iv) B. (i), (iv), (vi) & (ix)
C. (iv), (vi), (vii) & (ix) D. (vi), (vii), (viii) & (ix)

2. Insects attack all stages, parts and products of plants. In which of the following ways they attack the crop plants?

- A. By cutting the root, stem and leaf
B. By sucking the cell sap from various parts of the plant
C. By making holes into stems and fruits
D. All of the above

3. In tea plantations, tea-pickers collect the young tender shoots from the plants and fill large baskets that they carry on their backs. New shoots appear in few days. In rubber plantations, workers collect latex by making cuts in the bark of the rubber trees. The trees continue to live for many years. Which of the following statements about these activities is false?

- A. The plants are not permanently harmed
B. The cultivators are careful not to harm their crop
C. Human needs are met by the tea and rubber produced
D. The workers harm the plants by plucking their shoots and cutting their barks

4. Acid rain literally means that the rain water contains excessive amounts of acids. The harmful gases react with water in the atmosphere to form which of the following acids?

- A. H_2SO_4 & $HN O_3$ B. $HN O_3$ & H_2CO_3 C. H_2CO_3 & $KN O_3$ D. H_2SO_4 & HCl

5. Match column I with column II and mark the correct option from the odds given below.

Column I	Column II
(a) Audible range	(i) Faster transmission of sound
(b) Infrasonic range	(ii) Slower transmission of sound
(c) Ultrasonic range	(iii) Less than 20 Hz
(d) Denser medium	(iv) 20 Hz - 20 kHz
(e) Rarer medium	(v) More than 20 kHz

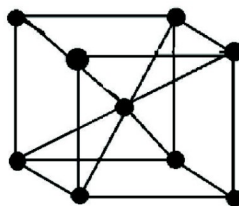
Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(i)	(ii)	(iv)	(iii)	(v)
B	(iv)	(iii)	(v)	(i)	(ii)
C	(iii)	(v)	(i)	(ii)	(iv)
D	(v)	(i)	(ii)	(iv)	(iii)

6. Use this chart to answer questions. If you visited Mars, each day would seem____?

Planet	Period of Revolution Around the Sun (in Earth Time)	Period of Rotation of Its Axis (in Earth Time)
Mercury	88 days	59 days
Venus	225 days	243 days
Earth	385 days	24 hrs
Mars	687 days	24 hrs 37 min
Jupiter	11.9year	9hrs50 min
Saturn	29.5year	10 hrs 40 min
Uranus	84 years	11 hrs
Neptune	164 years	16 hrs
Pluto	248 years	6 days 9 hrs

- A: Longer than an Earth year
B: Shorter than an Earth day
C: About the same as an Earth year
D: About the same as an Earth day

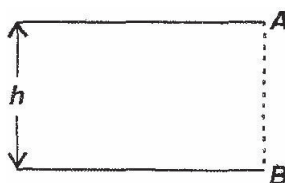
7. The unite cell of metallic sodium looks like a body-centered cube. What is the number of atoms are contained in one unit cell?



- A. 1
B. 2
C. 5
D. 9

8. A body of mass m falls freely through a height h . Its velocity when it just reaches the ground is____?

- A. $g h$
B. $\sqrt{2gh}$
C. $\sqrt{gh}$
D. h/g



9. Match column I with column II and mark the correct option from the cods given below.

Column I	Column II
(a) Pressure	(i) No unit
(b) Thrust	(ii) kg m^{-3}
(c) Density	(iii) N m^{-2}
(d) Relative density	(iv) N

Option	Column-A	Column-B	Column-C	Column-D
A	(iv)	(ii)	(i)	(iii)
B	(iii)	(iv)	(ii)	(i)
C	(ii)	(i)	(iii)	(iv)
D	(i)	(iii)	(iv)	(ii)

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

Statement 1: Action reaction forces act on two different objects.

Statement 2 : Action and reaction have zero resultant?

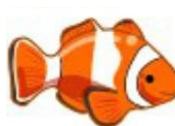
- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1
- B. Both statements 1 and statement-2 are true but statement 2 is not the correct explanation of statement 1
- C. Statement 1 is true but statement 2 is false
- D. Statement 1 is false but statement 2 is true
11. A certain group has a three-chambered heart and respiration is either by gills, lungs or skin. Which of the following figures is a representative of such group?



A.



B.



C.



D.

12. Which of the following pairs is/are incorrectly matched?

- (i) Linnaeus - Four kingdom system of classification
- (ii) Whittaker - Five kingdom system of classification
- (iii) Woese - Two kingdom system of classification
- (iv) Haeckel - Three kingdom system of classification

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

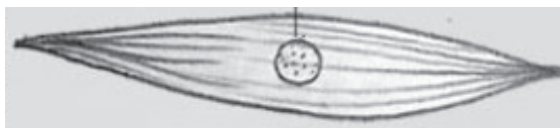
13. A spoon is kept in contact with ice cubes for sometime. Later, the same spoon was held over the flame of a small candle. The figure shows the observation. What do you infer from the given figure?

- A. Spoon is an inflammable substance
- B. Burning of candle is a spontaneous process
- C. CO_2 is a product of combustion
- D. Water vapour is a product of combustion



14. To supply nutrients to muscle fibers____?

- A. Striated muscle fibre
- B. Smooth muscle fibre
- C. Cardiac muscle fibre
- D. Stratified muscle fibre



15. Which of the following pairs are correctly matched?

(i) Food storage	Sclerenchyma
(ii) Growth	Cambium
(iii) Transport of food	Phloem
(iv) Protection	Hypodermis
(v) Support	Collenchyma

- A. (i), (ii) & (iii)
- B. (ii), (iii) & (v)
- C. (iii), (iv) & (v)
- D. (ii), (iii) & (iv)

16. Which of the following statements is true regarding the given microscope?

- A. Magnification is independent of intensity of light
- B. Magnification is independent of the size of microscope
- C. Magnification is independent of the numerical aperture
- D. All of the above



17. A thin sheet of gold foil is bombarded with α particles as in Rutherford's experiment. Which of the following descriptions most accurately represents the path of the α particles?

Option	Undeflected	No. of particles deflected through a small angle	No. of particles deflected through a large angle
i	All	None	None
ii	Most	A few	None
iii	Most	A few	A few
iv	A few	Most	A few

- A. i
- B. ii
- C. iii
- D. iv.

18. Read the given statements and mark the correct option

Statement 1: Gun powder is an example of mixture.

Statement 2: The components of gun powder are not present in a fixed ratio?

- 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

19. Read the given statements and mark the correct option.

Statement 1: The constituents of petroleum can be separated using fractional distillation.

Statement 2: Fractional distillation is a method of separating heterogeneous liquid- liquid mixtures

- 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.

20. Which of the following statement is correct?

- A. Boiling is a bulk phenomenon and evaporation is a surface phenomenon
- B. Boiling is a surface phenomenon and evaporation is a bulk phenomenon
- C. Boiling and evaporation both are surface phenomenon
- D. Boiling and surface both are bulk phenomenon.

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	B	D	D	A	B	D	B	C	B	C
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	B	B	D	B	B	D	C	C	C	A

Invigilator's Signature

1. Read the following paragraph carefully and fill up the blanks with correct option. Born on 26th November, 1921, _____ is called the Architect of India's _____ Modern Dairy Industry and the Father of _____ Revolution. He is the founder chairman of the National Dairy Development Board (NDDB). NDDB designed and implemented the world's largest dairy development programme, called _____

- A. Dr. V. Kurien, Green, Organic production
- B. Dr. C.L.A. Laveran, Blue, Phyto-enrichment
- C. Dr. V. Kurien, White, Operation flood
- D. Dr. Allen Porter, Silver, Operation flood

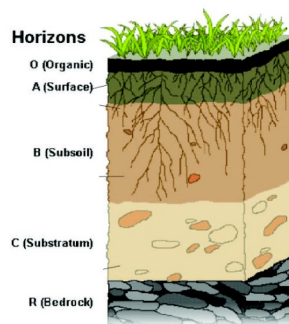
2. Match column I and column II and select the correct option from the codes given below

Column I	Column II
(a) IR-8	(i) Cow
(b) Shakti	(ii) Maize
(c) Gir	(iii) Fowl
(d) IBL-80	(iv) Mustard
(e) Kranti	(v) Rice

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(v)	(ii)	(i)	(iii)	(iv)
B	(i)	(ii)	(v)	(iii)	(iv)
C	(v)	(iv)	(ii)	(i)	(iii)
D	(ii)	(v)	(iii)	(i)	(iv)

3. The given figure shows different soil horizons. Which horizon(s) constitute(s) sub soil?

- A. A horizon only
- B. A & B horizons
- C. B & C horizons
- D. C horizon only



4. Column I is containing different vectors and column II is containing diseases transmitted by them. Match column I with column II and select the correct option from the codes given below

Column I	Column II
(a) Tse tse fly	(i) Dysentery
(b) House fly	(ii) Malaria
(c) Anopheles	(iii) Dengue
(d) Aedes	(iv) Sleeping sickness
(e) Sand fly	(v) Kala-azar

Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(i)	(iii)	(iv)	(v)	(ii)
B	(i)	(iv)	(v)		(iii)
C	(iv)	(v)	(ii)	(iii)	(i)
D	(iv)	(i)	(ii)	(iii)	(v)

4. Read the following statements carefully and identify X, Y and Z respectively.

- (i) X reacts violently with cold water.
 (ii) Y reacts with boiling water.
 (iii) Z reacts with steam

A . Na, Mg, Cu

B . Na, Zn, Fe

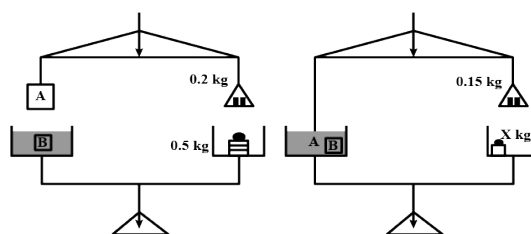
C . Cu, Zn, Na

D . Zn, Cu, Na

6. Consider the following figures 1 and 2. In figure 1, the mass of the body A in air is 0.2 kg. The mass of the water container (with water in it) is 0.5 kg. In figure 2, when A is completely immersed in the water of the container B the readings of the respective balances change as shown.

What is the value of X?

- A. 0.55 kg
 B. 0.15 kg
 C. 0.3 kg
 D. 0.45 kg



7. A ball is released from the top of a tower of height h metres. It takes T seconds to

reach the ground. What is the position of the ball in seconds

$\frac{h}{9}$ metre above the ground $\longrightarrow$ A

$\frac{7h}{9}$ metres above the ground $\longrightarrow$ B

$\frac{8h}{9}$ metre above the ground $\longrightarrow$ C

$\frac{17h}{18}$ metres above the ground $\longrightarrow$ D

8. Read the given statements and mark the correct option.

Statement 1: Newton's second law of motion gives the measurement of force.

Statement 2: According to Newton's second law of motion, force is directly proportional to the rate of change of momentum

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

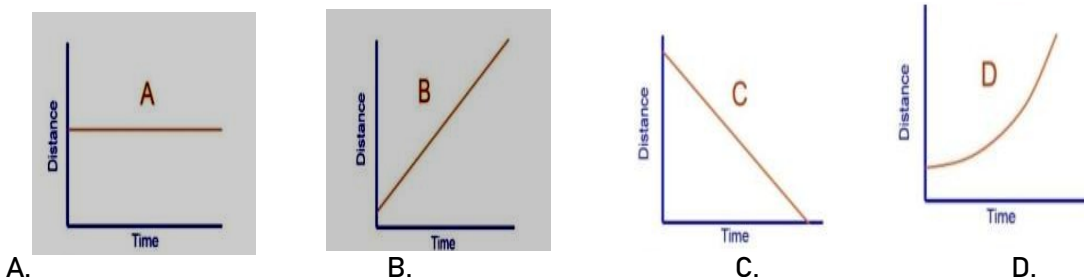
9. A block of metal weighing 2 kg is resting on a frictionless plane. It is struck by a jet releasing water at the rate of 1 kg/sec and at a speed of 5 m/s. The initial acceleration of the block is

- A. 7.5 m/s²
- B. 1.25 m/s²
- C. 5 m/s²
- D. 2.5 m/s²

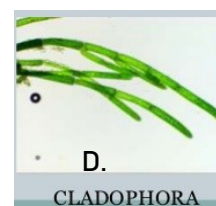
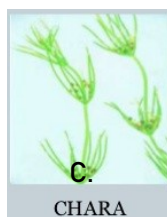
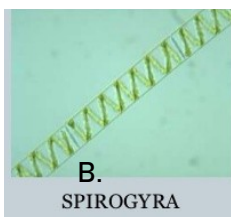
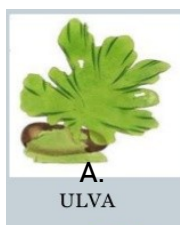
10. Which equation defines Newton's Second law of motion?

- A. $F = ma = \frac{dp}{dt}$
- B. $F = m \frac{da}{dt} = p$
- C. $\frac{df}{dt} = ma = p$
- D. $F = ma = p$

11. Which of the following is the position distance and time graph for a body at rest?

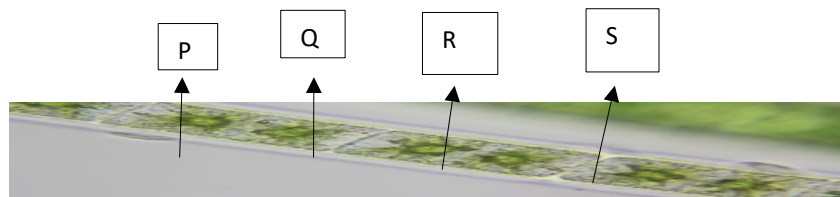


12. _____ have well defined vascular system for the conduction of water and other substances from one part of the plant body to another



13. The given figure shows a type of a green alga in which some parts are labeled as P Q, R and S. Which part contains green pigment for photosynthesis?

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



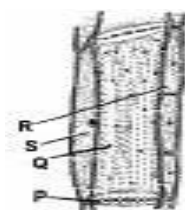
14. Which of the following statements are false about thallophyta?

- (i) Here is no vascular system.
(ii) Vascular systems are well developed.
(iii) Plant body is not differentiated.
(iv) Plant body is differentiated into root, stem and leaves

- A.(i)& (iii) B.(i)& (iv) C.(i)& (iii) D.(ii)& (iv)

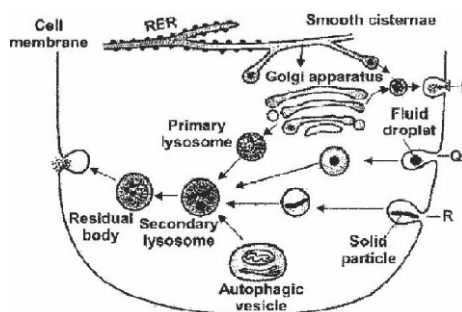
15. Given figure is the section of phloem in which some parts are labeled as P, Q, R and S. Which part contains dense and very active cytoplasm?

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



16. Which labelled part (P Q, R) in the given figure is referred to as endocytosis?

- A. P
B. Q
C. R
D. Both Q & R



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

Column I	Column II
(a) Ions	(i) Same mass number, different atomic number
(b) Isobars	(ii) Same number of neutrons, different mass number
(c) Isotopes	(iii) Formed by loss or gain of electrons
(d) Isotones	(iv) Combining capacity of an atom
(e) Valency	(v) Same atomic number, different mass number

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

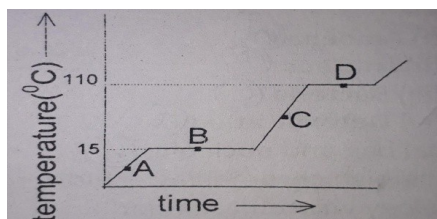
18. Read the passage carefully and answer.

The constituents of a heterogeneous mixture are X, Y and Z. In this mixture if mixture X, Y is taken, X can be separated using magnetic separation from Y. If Y, Z mixture is taken it can be separated using distillation method. The different states of X, Y and Z respectively are

- A.Solid, solid, liquid B.Solid, liquid, solid
C.All are liquids D.All are solids

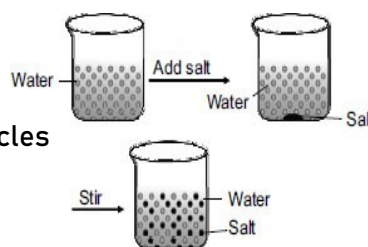
19. What is the physical state of A, C and E?

- A . A-solid, B-liquid, E-gas
B . A-solid, B-gas, E-liquid
C . A-liquid, E-solid, B-gas
D . A-liquid, E-gas, B-solid



20. The conclusion we can draw from the below experiment is that

- A. Nature of matter is continuous
B. Matter is made up of particles
C. Particles of salt get into the spaces between the particles
D. Both (B) & (C)



ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	C	A	D	D	B	A	C	A	D	A
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	A	C	C	D	D	D	B	A	A	D

Invigilator's Signature

1. Which of the following pairs are correctly matched?

Column I	Column II
(i) Cereal crops	Sorghum
(ii) Pulse crops	Lentil
(iii) Oil seed crops	Sesame
(iv) Fodder crops	Castor

- A. (i)&(ii) B. (ii) & (iv)
C. (i), (ii) & (iii) D. (iii) & (iv)

2. Find out the correct sentences_?

Hybridisation means crossing between genetically dissimilar plants.

Cross between two varieties is called as inter-specific hybridization.

Introducing genes of desired character into a plant gives genetically modified crop

Cross between plants of two species is called as inter-varietal hybridization

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

3. Less incidence of lichens are observed on the sides of trees facing the roads as compared to the sides away from the roads. Which of the following is the probable reason for this?

- A. Sensitivity to noise pollutants B. Sensitivity to air pollutants
C. Sensitivity to water pollutants D. Sensitivity to soil pollutants

4. Read the passage carefully and answer?

A source of sound is placed at one end of an iron bar two kilometer long and two sounds are heard at the other end at an interval of 56 seconds. If the velocity of sound in air is 330 m/s. The time taken by sound to travel 2 km in iron is___?

- A. 0.46 s B. 0.16 s
C. 2.26 s D. 3.36 s

5. Read the given statements and mark the correct option.

Statement 1: Echo is produced only when sound is incident on hard and polished surface.

Statement 2: Sound energy can be totally reflected by objects with a soft and loose texture.

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

6. Read the passage carefully and answer?

A source of sound is placed at one end of an iron bar two kilometer long and two sounds are heard at the other end at an interval of 56 seconds. If the velocity of sound in air is 330 m/s. The time taken by sound to travel 2 km in iron is should be replaced.

- A. 0.46 s
- B. 0.16 s
- C. 2.26 s
- D. 3.36 s

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

Statement 1: A man carrying a bucket of water and walking on a rough level road with a uniform velocity does no work while carrying the bucket.

Statement 2: The work done on a body by a force (F) in giving it a displacement S is defined as $W = F \cdot S = FS \cos \theta$, where θ is the angle between vectors F and S

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

8. A particle of mass 0.3 kg is subjected to a force $F = kx$ with $k = 15 \text{ N/m}$ and x being its distance from the origin. What will be its initial acceleration if it is released from a point 20 cm away from the origin?

- A. 5 m/s^2
- B. 10 m/s^2
- C. 3 m/s^2
- D. 15 m/s^2

9. A player caught a cricket ball of mass 150 g moving at a rate of 20 m/s. If the catching process be completed in 0.1 s, then the force exerted by the ball on the hands of the player is_____?

- A. 0.3 N
- B. 30 N
- C. 300 N
- D. 3000 N

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

Column I	Column II
(a) 36 km h^{-1}	(i) 2000 mm
(b) 1 ms^{-2}	(ii) 980 cms^{-2}
(c) 9.8 ms^{-2}	(ii) 980 cms^{-2}
(d) 0.02 km	(iv) 10 ms^{-1}

Option	Column-A	Column-B	Column-C	Column-D
A	(iv)	(iii)	(ii)	(i)
B	(iii)	(ii)	(i)	(iv)
C	(ii)	(i)	(iv)	(iii)
D	(i)	(ii)	(iii)	(iv)

11. The incorrect statement about average speed is____?

- A. Average speed is a scalar quantity
- B. Average speed can be found for a missing body
- C. Average speed is defined for an interval of time
- D. Average speed = total distance travelled

12. Which of the following statements are false about thallophyta?

- (i) There is no vascular system.
- (ii) Vascular systems are well developed.
- (iii) Plant body is not differentiated.
- (iv) Plant body is differentiated into root, stem and leaves

- A. (i)& (iii)
- B. (i)& (iv)
- C. (i)& (iii)
- D. (ii)& (iv)

13. Under the microscope, these muscles show alternate light and dark bands when stained appropriately. Which of the following statements are not true about these muscles?

- A. These are also called voluntary muscles as they can be moved voluntarily
- B. These are also called involuntary muscles as they control involuntary movements
- C. These are also called skeletal muscles as they are mostly attached to bones
- D. These are also called striated muscles as they show striations

14. These are membrane bound vacuolar organelles discovered by de Duve in 1949. They mostly occur in animal cells but they have also been reported in plant cells. They are concerned with the waste disposal system of the cell. The cell organelles referred to in the above paragraph are____?

- A. Mitochondria
- B. Golgi bodies
- C. Peroxisomes
- D. Lysosomes

15. Which of the following is not correct observation/conclusion from Rutherford's scattering experiment?

- A. Nucleus is small but heavy
- B. Nucleus always carries positive charge
- C. Atom is nearly 10^5 times greater than the size of the nucleus
- D. The number of α -particles hitting the nucleus is very large

16. Two pure substances X and Y are obtained by two different methods containing elements A and B. Substance X has a mass of 2.25 grams and contains 0.90 gram of B. Substance Y is made up of 60% A and 40% B by weight. This is an illustration of?

- A. Law of multiple proportions
- B. Law of constant proportion
- C. Law of reciprocal proportion
- D. GayLussac's law of combining volumes

17. Filtration as a method of separation can be used for mixtures that are____?

- A. Homogeneous and liquid-in-gas mixtures
- B. Heterogeneous and liquid-in-liquid mixtures
- C. Homogeneous and solid-in-liquid mixtures
- D. Heterogeneous and solid-in-liquid mixtures

18. Read the passage carefully and answer?

The constituents of a heterogeneous mixture are X, Y and Z. In this mixture if mixture X, Y is taken, X can be separated using magnetic separation from Y. If Y, Z mixture is taken it can be separated using distillation method. Which of the following mixture can X, Y, Z be?

- A. Iron, salt, water
- B. Sulphur, carbon disulphide, water
- C. Gun powder, common salt, water
- D. Iodine, sand, alcohol

19. Match different organisms in ____?

Column - I with their related characteristics in

Column - II and select the correct option from the codes given below.

Column - I	Column - II
(a) Entamoeba histolytica	(i) An alga which carries out photosynthesis
(b) Bacteriophage	(ii) A protozoan that causes disease in human beings by living in the large intestine of humans
(c) Rhizopus	(iii) A virus which infects a bacterial cell
(d) Chlamydomonas	(iv) A common black bread mould

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

20. Read the given statements and mark the correct option.

Statement 1 : Smell of burning incense stick spreads all around due to the diffusion of its fumes into the air.

Statement 2 : Increase in temperature increases kinetic energy of molecules

- 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

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	C	A	B	A	C	A	A	B	B	A
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	B	D	B	B	D	B	D	A	A	A

Invigilator's Signature

1. Which of the following is/are incorrect statement(s) regarding manure?

- (i) Manure enhances the water holding capacity of the soil.
- (ii) Manure is nutrient specific i.e. supply a particular desired nutrient.
- (iii) Manure decreases the number of friendly microbes.
- (iv) Manures improve the texture of the soil.
- (v) Manure is prepared by the decomposition of dead plant and animal matter.

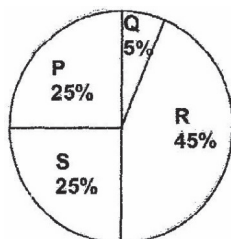
- A. (i), (iii) and (v) B. (v) only C. (ii), (iii), (iv) and (v) D. (ii) and (iii)

2. Which of the following are the characteristics of an essential plant nutrient?

- (i) It must have a direct influence on the plant nutrition and metabolism.
- (ii) Its deficiency can be corrected by supplying some alternative nutrient.
- (iii) It makes plant able to complete its life cycle.
- (iv) The requirement of the element must be specific

- A. (i), (ii) & (iii) B. (ii) & (iii) C. (i), (iii) & (iv) D. (iii) & (iv)

3. Soil is a complex mixture. It consists of air, water, organic matter and mineral matter. The given figure shows the percentage by volume of different soil components as P, Q, R and S. What will you place in S?



- A. Air
B. Water
C. Organic matter
D. Either air or water

4. Which of the following pairs are incorrectly matched?

COLUMN-1	COLUMN-11
(i) Measles	Viral disease
(ii) Anthrax	Fungal disease
(iii) Cholera	Bacterial disease
(iv) Malaria	Protozoan disease
(v) Ringworm	Worm disease
(vi) Sleeping sickness	Viral disease

- A. (i), (iii) & (iv) B. (i), (iii) & (v) C. (ii), (v) & (vi) D. (ii), (iv) & (vi)

5. Which of the following statements is/are correct?

- (i) The distance between two consecutive compressions is called frequency of sound wave.
- (ii) Sound propagates as pressure variations
- (iii) Compressions are narrower in a high pitched sound

A. (i) only B. (ii) only C. (iii) only D. (ii) & (iii)

6. A.R. Raman is conducting a musical night in an open auditorium in New York. If two persons, one who is sitting in the auditorium at a distance of 250 m from the stage and the other who is watching the live program on a television set sitting in front of it in Hyderabad, then the person who hear him first

A. Person sitting in auditorium B. Person sitting in Hyderabad
C. Both will hear at a time D. Cannot be said

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

Statement 1: Earth has an atmosphere but the moon does not.

Statement 2: Moon is very small in comparison to earth

- 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. A tank 2 m high is half filled with water and then filled to the top with Oil of density 0.80 g/cc. What is the pressure at the bottom of the tank due to these liquids (Take $g = 10 \text{ ms}^{-2}$) is___?

A. $1.8 \times 10^3 \text{ Nm}^{-2}$ B. $0.9 \times 10^3 \text{ Nm}^{-2}$
C. $1.8 \times 10^4 \text{ Nm}^{-2}$ D. $0.9 \times 10^4 \text{ Nm}^{-2}$

9. In a rocket, fuel burns at the rate of 1 kg/s. This fuel is ejected from, the rocket with a velocity of 60 km/s. This exerts a force on the rocket equal to___?

A. 6000 N B. 60000 N
C. 60N D. 600N

10. A body thrown vertically up with a velocity u reaches the maximum height h after T second. Correct statement among the following is___?

- A. At a height $h/2$ from the ground its velocity is $u/2$
- B. At a time T its velocity is u
- C. At a time $2T$ its velocity is $-u$
- D. At a time $2T$ its velocity is $-6u$

11. A particle is acted upon by a constant force, the magnitude of which is always perpendicular to the velocity of particle. The motion of particle takes place in same plane. From the above statement it implies____?

- A. Particle is moving in a circular path
- B. Magnitude of its acceleration is constant
- C. Its velocity is uniform
- D. Both (A) & (B)

12. Which of the following statements is true about dicotyledons?

- A. Their root system consists of similar fibrous roots
- B. Their leaves have parallel venation
- C. Their vascular bundles are arranged in a ring
- D. Their flowers are trimerous

13. Which of the following pairs is incorrectly matched?

- A. Ligament - Yellow elastic tissue
- B. Cartilage - Adipose connective tissue
- C. Lymph - Fluid connective tissue
- D. Bone - Skeletal connective tissue

14. Endoplasmic reticulum is a network system of folded membrane in the cytoplasm which performs several special functions. Which of the following statements regarding its function is incorrect?

- A. Involved in the process of detoxification
- B. Involved in the biosynthesis of cholesterol
- C. Involved in the formation of lysosomes
- D. Provides a pathway for the transport of proteins

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

Statement 1: Only one in 12000 alpha particles were deflected in Rutherford's experiment

Statement 2 : Most of the space in the atom is empty

- 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

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

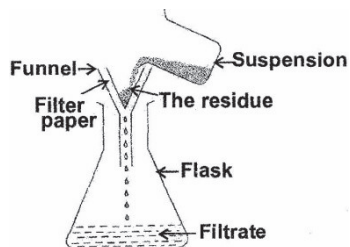
Statement 1 : Relative atomic mass of chlorine is 35.5.

Statement 2: Chlorine gas is diatomic element

- 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 1 is false and statement 2 is true

17. Beside figure can be used to separate_____?

- A. Sand from water
- B. Stones from water
- C. Gravels from water
- D. All of these



18. Which of the following mixtures will be most difficult to separate?

- A. Iron filings (powder) + sand
- B. Sand + water
- C. Sawdust + stones
- D. Alcohol + water.

19. Which of the following statements does not go well with the liquid state?

- A. Particles are loosely packed in the liquid state
- B. Fluidity is maximum in the liquid state
- C. Liquids cannot be compressed
- D. Liquids take up the shape of any container in which they are placed

20. 300k will have its corresponding temperature in degree centigrade as_____?

- A. 30°C
- B. 300°C
- C. 27°C
- D. 673°C

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	C	C	D	C	D	B	B	C	B	C
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	D	C	B	C	B	B	D	D	B	C

Invigilator's Signature

1. Some species of fishes can be cultured in a single fish pond. These fishes do not compete for food as they have different food habits. In the following columns fishes are matched according to their food habits. Select the incorrect match

- A. Labeo rohita - Column feeder
B. Catla catla - Surface feeder
C. Irrhinus mrigala - Bottom feeder
D. Common carp - Surface feeder

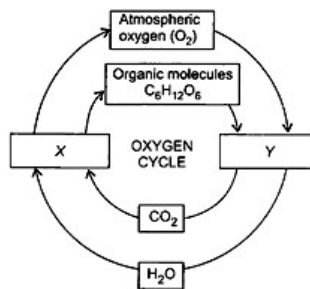
2. Match column I with column II and select the correct option from the odes given below____?

Column I	Column II
(a) Apis indica	(i) Little bee
(b) Apis dorsata	(ii) Indian bee
(c) Apis florea	(iii) Rock bee
(d) Apis mellifera	(iv) Italian bee

Option	Column-A	Column-B	Column-C	Column-D
A	(i)	(ii)	(iii)	(iv)
B	(ii)	(iii)	(i)	(iv)
C	(ii)	(iv)	(iii)	(i)
D	(ii)	(iv)	(i)	(iii)

3. The given figure represents the oxygen cycle which maintains the level of oxygen in the atmosphere. Which of the following processes will you place in 'X' and 'Y' of the figure?

Option	Column-X	Column-Y
A	Combustion	Respiration
B	Respiration	Transpiration
C	Photosynthesis	Evaportaion
D	Photosynthesis	Respiration



4. Match the causal organisms given in column I with diseases given in column II and select the correct option from the codes given below.

Column I	Column II
(a) Protozoa	(i) Ringworm
(b) Bacteria	(ii) AIDS
(c) Virus	(iii) Cholera
(d) Fungi	(iv) Elephantiasis

Option	Column-A	Column-B	Column-C	Column-D
A	(iii)	(i)	(ii)	(iv)
B	(ii)	(i)	(iv)	(iii)
C	(i)	(iii)	(ii)	(iv)
D	(iv)	(iii)	(ii)	(i)

5. A.R. Rahman is conducting a musical night in an open auditorium in New York. If two persons, one who is sitting in the auditorium at a distance of 250 m from the stage and the other who is watching the live program on a television set sitting in front of it in Hyderabad, then the person who hear him first___?

- A. Person sitting in auditorium B. Person sitting in Hyderabad
C. Both will hear at a time D. Cannot be said

6. Match column I with column II and mark the correct option from the codes given below___?

Column I	Column II
(a) String vibration	(i) Tabla
(b) Membrane vibration	(ii) Bicycle bell
(c) Vibration of air	(iii) Sitar
(d) Vibration of plate	(iv) Flute

Option	Column-A	Column-B	Column-C	Column-D
A	(i)	(iv)	(ii)	(iii)
B	(iii)	(i)	(iv)	(ii)
C	(iv)	(ii)	(iii)	(i)
D	(ii)	(iii)	(i)	(iv)

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

Statement 1: The value of acceleration due to gravity of earth does not depend upon mass of the body.

Statement 2: Acceleration due to gravity is a constant quantity

- 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. During a planned man oeuvre in a space flight, a free-floating astronaut A pushes another free-floating astronaut B, the mass of A being greater than that of B. Then, the magnitude of the force exerted by astronaut A on astronaut B is ?

A. Equal to zero
 B. Equal to the force exerted by B on A
 C. Greater than the force exerted by B on A
 D. Less than the force exerted by B on A

9. Read the passage carefully and answer?

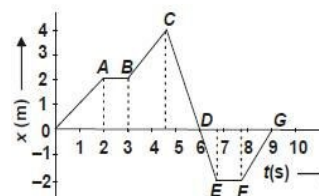
An object of mass 15 kg travelling in a straight line with a velocity of 5 ms^{-1} collides with a wooden block of mass 5 kg resting on the floor. This object sticks with wooden block after collision and both move together in a straight line. The total momentum after collision is

A. 3.5 kg ms^{-1} B. 1.5 kg ms^{-1} C. 7.5 kg ms^{-1} D. 2 kg ms^{-1}

10. Read the passage carefully and answer?

A dancer demonstrating dance steps along a straight line. The position time graph is given below. The average velocity of the dancer during time interval between $t = 4.5 \text{ s}$ to $t = 9 \text{ s}$ is

A. 1 ms^{-1}
 B. -1.33 ms^{-1}
 C. 2.75 ms^{-1}
 D. -0.89 ms^{-1}



11. Two racing cars of masses m_1 and m_2 are moving in circles of radii r and r_2 respectively. Their speeds are such that each makes a complete circle in the same length of time t . The ratio of angular speed of the first car to that of the second car is

A. $m_1 : m_2$ B. $r_1 : r_2$ C. 1 : 1 D. $m_1 r_1 : m_2 r_2$

12. Which of the following pairs is/are incorrectly matched?

(i) Linnaeus - Four kingdom system of classification
 (ii) Whittaker - Five kingdom system of classification
 (iii) Woese - Two kingdom system of classification
 (iv) Haeckel - Three kingdom system of classification

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

13. This tissue serves as food storage tissue and also provides support to the stem of herbaceous plants. Which of the following tissues performs such functions?

A. Parenchyma B. Collenchyma C. Sclerenchyma D. Both (A) & (B).

14. Which of the following is not correct observation/conclusion from Rutherford's scattering experiment?

A. Nucleus is small but heavy
 B. Nucleus always carries positive charge
 C. Atom is nearly 10^5 times greater than the size of the nucleus
 D. The number of α -particles hitting the nucleus is very large

15. Which one of the following atoms has a mass number of 40?

ATOM	NUMBERS OF PROTONS	NUMBER OF NETURONS
I	13	14
II	18	22
III	20	22
iv	20	51

- A. I B. ii C. iii D. iv

16. b -particles are represented as____?

- A. -1^0e
 B. $+1^0e$
 C. -1^1e
 D. 0^1e

17. Colloids may be more than thousand times bigger than an atom, but are more than thousand times smaller than an ant. These colloids can be removed from a solution by a____?

- A. Thin piece of cloth B. Centrifuge
 C. Filter paper D. Parchment paper

18. When sodium hydroxide is added to ferric chloride solution, a reddish brown precipitate is formed The precipitate is separated from the mixture by the process of____?

- A. Evaporation B. Sublimation
 C. Filtration D. Fractional distillation

19. Ice floats on the surface of water because____?

- A. It is heavier than water B. The density of both water and ice is the same
 C. Ice is lighter than water D. None of the above.

20. Which of the following correctly indicates the relative randomness of particles in the three states of matter?

- A. Solid > liquid > gas B. Liquid > solid > gas
 C. Liquid > gas > solid D. Gas > liquid > solid

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	D	B	C	D	A	B	C	B	C	D
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	C	B	A	D	B	A	D	C	C	D

ANSWER SHEET
National Astronomy & Science Olympiad

Filling of all columns completely & accurately is important.

Candidate's Name

[illegible]

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WRONG METHODS

CORRECT METHOD



Grade

Gender

2nd 3rd 4th 5th 6th 7th 8th 9th 10th

Male ☐

Female ☐

RollNo.

[illegible]

Father's Name

[illegible]

School Name

[illegible]

E-mail Id

[illegible]

City

[illegible]**School Code**

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9	9	9	9	9	9	9	9
0	0	0	0	0	0	0	0

MARK YOUR ANSWERS HERE

A B C D

A B C D

A B C D

A B C D

1					6					11					16				
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Candidate's Signature

Invigilator's Signature

1. It is a type of cropping pattern which makes better use of the natural resources of sunlight, land and water and ensures maximum utilization of the nutrients supplied, as crops growing in definite row pattern have different nutrient requirements. Identify it

A. Mixed cropping B. Intercropping
C. Crop rotation D. Norflok rotation

2. Which of the following pairs are correctly matched?

Column I	Column II
(i) Loose smut of wheat	Seed-borne disease
(ii) Bacterial blight of rice	Soil-borne disease
(iii) Rust of wheat	Air-borne disease
(iv) Tikka disease of groundnut	Water-borne disease

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

3. Which of the following pairs are correctly matched?

Column I	Column II
(i) Azotobacter	Free living nitrogen fixing bacteria
(ii) Pseudomonas	Symbiotic nitrogen fixing bacteria
(iii) Nitrosomonas	Nitrifying bacteria
(iv) Rhizobium	Symbiotic denitrifying bacteria

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

4. Pulse polio immunization programme was launched in 1995-1996 with an aim to eradicate polio disease from the world. It involves simultaneous administration of polio drops (polio vaccine) to whole of the high risk population (i.e., children under three years of age) on a single day throughout the nation. What is/are the of basic aim of pulse polio immunisation programme?

A. To immunize those children who are not earlier immunized or are partially
B. immunized to boost the immunity of children already immunized
C. To replace the disease-causing virus by harmless vaccine virus in the
D. Environment All of the above

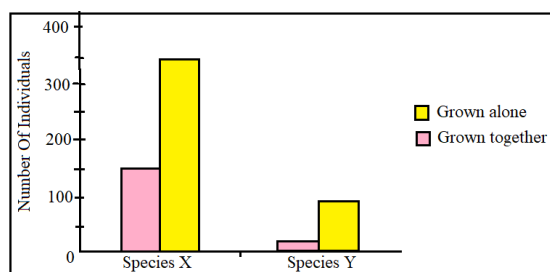
5. _____ is the characteristic of a musical sound by which a loud sound can be distinguished from a faint sound even though both have the same pitch___?

A. Loudness B. Pitch C. Quality D. None of these

6. The distance x covered in time t by a body having velocity v_0 and having a constant acceleration a is given by $x = v_0 t + \frac{1}{2} at^2$. This result follows from

A. Newton's first law
B. Newton's second law
C. Newton's third law
D. None of these

7. A laboratory experiment used two insect species - X and Y. For one treatment, both species were grown in separate chambers by themselves on a suitable food source. For the second treatment, the two species were grown in the same chamber together on the same type and amount of food as in the first treatment. The figure below shows the results at the end of the experiment. Based on these results find out the suitable classification of the two species.



A. Competitors. B. Antagonists.
C. Mutualists D. Predators or pathogens.

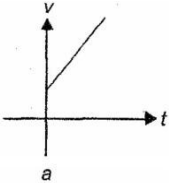
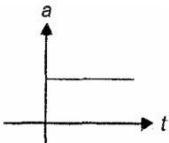
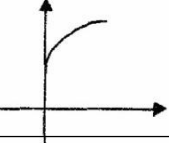
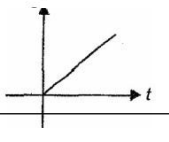
8. A person is standing in an elevator. The situation in which he finds his weight less than actual, is when?

A. The elevator moves upward with constant acceleration
B. The elevator moves downward with constant acceleration
C. The elevator moves upward with uniform velocity
D. The elevator moves downward with uniform velocity

9. A hammer weighing 2.5 kg moving with a speed of 1 m/s strikes the head of the nail driving it 10 cm into the wall. The acceleration during impact and the impulse imparted to wall will be respectively?

A. -5 m/s^2 , 2.5 Ns B. -10 m/s^2 , 5 Ns
C. -7.5 m/s^2 , 3.5 Ns D. None of these.

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

Column I	Column II
(a) Uniform velocity	(i) 
(b) Uniform acceleration	(ii) 
(c) Uniform retardation	(iii) 
(d) Uniform acceleration with initial velocity	(iv) 

Op tio n	Column-A	Column-B	Column-C	Column-D
A	(i)	(ii)	(iii)	(iv)
B	(ii)	(iv)	(i)	(iii)
C	(iv)	(ii)	(iii)	(i)
D	(iii)	(i)	(iv)	(ii)

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

Statement 1: Acceleration and displacement are in the opposite directions during retardation.

Statement 2: Acceleration is given as the change in velocity per unit time

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

12. These organisms do not possess a well defined nucleus or organelles, nor do any of them show multicellular body designs. Some of them have cell walls while others do not. Which of the following kingdoms constitutes such organisms?

- A. Protista
- B. Monera
- C. Fungi
- D. Plantae.

13. Intestine absorbs due digested food materials. What type of epithelial is responsible for that?
- A. Stratified squamous epithelium B. Columnar epithelium
C. Psuedostratified epithelium D. Cuboidal epithelium
14. The internal organization of chloroplast consists of numerous membrane layers embedded in a homogeneous matrix. These stacks of membranous layer contain chlorophylls and are known as__?
- A. Stroma B. Cristae C. Grana D. Oxysomes
15. The charge of proton (p^+) is____?
- A. $+1.6 \times 10^{-19}C$ B. $1.6 \times 10^{-19}C$ C. $+1.6 \times 10^{19}C$ D. $1.6 \times 10^{19}C$
16. Read the given statements and mark the correct option.
Statement 1: 23 g of sodium has 6.022×10^{23} atoms of sodium.
Statement 2 : Number of atoms in the given mass of sodium cannot be determined
- 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 1 is false and statement 2 is true
17. In an experiment, oxygen was added to hydrogen and heated. On burning a substance containing both oxygen and hydrogen was formed. What is this substance?
- A. Element B. Compound C. Solution D. Mixture
18. Sol and Gel are examples of examples of____?
- A. Solid-solid colloids
B. Sol is a solid-liquid colloid and Gel is liquid solid colloid
C. Sol is a solid-solid colloid and Gel is a solid-liquid colloid
D. Sol is a liquid-solid colloid and Gel is a solid-liquid colloid
19. Which of the following processes require heating?
- (i) Fusion (ii) Condensation (iii) Vaporisation (iv) Solidification
- A. (i) & (ii) B. (ii) & (iii) C. (i) & (iii) D. All of these
20. Which of the following generalizations cannot be made about the phase change of a pure substance from solid to liquid?
- A. It involves a change in potential energy B. It involves a change in kinetic energy
C. It involves no change in temperature D. It may take place at different temperatures

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	B	C	D	D	C	B	C	B	A	B
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	B	B	B	C	A	C	B	B	C	D

ANSWER SHEET
National Astronomy & Science Olympiad

Filling of all columns completely & accurately is important.

Candidate's Name

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WRONG METHODS

CORRECT METHOD



Grade

Gender

2nd 3rd 4th 5th 6th 7th 8th 9th 10th

Male ☐

Female ☐

RollNo.

[illegible][illegible]

Father's Name

[illegible]

School Name

[illegible]

E-mail Id

[illegible]

City

[illegible]**School Code**

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MARK YOUR ANSWERS HERE

A B C D

A B C D

A B C D

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Candidate's Signature

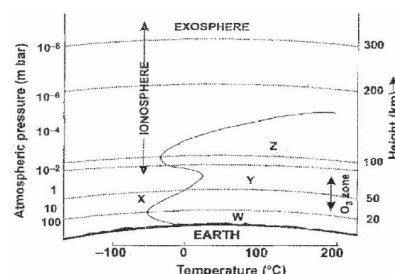
Invigilator's Signature

1. Which of the following statements is incorrect?

- A. Fertilizers contain much higher amount of nutrients in comparison t the manures
- B. Manure adds a great amount of organic matter in the form of humus in the soil
- C. Both fertilizers and manures are nutrient specific
- D. Fertilizers give short-term benefits whereas manures give long-term benefits

2. The given figure is of multilayered atmosphere in which the different layers are labeled as W, X, Y and Z. Many important climatic events such as cloud formations, thundering, lightening etc, take place in this layer. Identify the layer.

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



3. Eutrophication is the process in which dissolved oxygen in water is reduced due to excessive growth of algae. This is as a result of___?

- A. Change in temperature of water
- B. Extra loading of nutrients in water body
- C. Stratification of aquatic habitat
- D. Bioaccumulation in algae

4. Deficiency of the following nutrients (given in column I) relate to specific deficiency diseases (given in column II). Match both columns and select the correct option using the codes given below.

Column I			Column II		
(a) Niacin			(i) Scurvy		
(b) Vitamin C			(ii) Kwashiorkor		
(c) Vitamin K			(iii) Xerophthalmia		
(d) Protein			(iv) Pellagra		
(e) Vitamin A			(v) Bleeding		
Option	Column-A	Column-B	Column-C	Column-D	Column-E
A	(i)	(ii)	(iv)	(v)	(iii)
B	(iv)	(i)	(v)	(ii)	(iii)
C	(i)	(iii)	(v)	(iv)	(ii)
D	(iv)	(v)	(iii)	(ii)	(i)

5. Read the passage carefully and answer?

Two tuning forks, A and B vibrate with frequencies in the ratio 2 : 7 and their wavelengths in the ratio 3 : 4 respectively. Find the tuning fork producing greater velocity of sound

- A. Tuning fork A
B. Tuning fork B
C. Both produce same velocity
D. Can't say

6. The membrane of a drum vibrates to produce sound. Similarly the string of a sitar vibrates to produce sound. Based on these two examples answer the following question. Which part of a whistle vibrates to produce sound?

- A. Body of whistle
B. Air column
C. Mouth of the person
D. All of these

7. Read the passage carefully and answer?

An object of mass 1.5 kg travelling in a straight line with a velocity of 5 ms^{-1} collides with a wooden block of mass 5 kg resting on the floor. This object sticks with wooden block after collision and both move together in a straight line. The velocity of the combination of these objects after collision is___?

- A. 8.5 ms^{-1}
B. 9.5 ms^{-1}
C. 1.15 ms^{-1}
D. 1.5 ms^{-1}

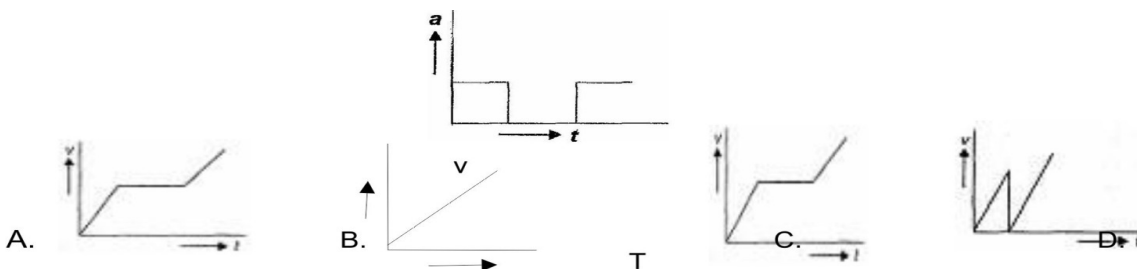
8. In the first second of its flight, a rocket ejects $1/60$ of its mass with a velocity of 2400 ms^{-1} the acceleration of the rocket is

- A. 19.6 ms^{-2}
B. 30.2 ms^{-2}
C. 40 ms^{-2}
D. 49.8 ms^{-2}

9. During a football match, the ball shot towards the goal struck the defender's foot at the speed of 10 m/s and it bounced back at 20 m/s . If the time of impact was 0.2 sec , and mass of the ball $1/2 \text{ kg}$, then average force exerted by defender on the ball is

- A. 75N
B. 35N
C. 50N
D. 40N

10. Which of the following would probably show the velocity-time graph for a body whose acceleration-time graph is shown in figure?



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

Statement 1: The distance x in which a car can be stopped depends on the initial velocity.

Statement 2 : Change in mass has no role to play.

- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1
 - B. Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of statement 1
 - C. Statement 1 is true but statement 2 is false
 - D. Statement 1 is false but statement 1 is true
12. Which of the following statements is not true for connecting the idea of evolution to classification?
- A. The organisms with ancient body designs are referred as higher organisms
 - B. The organisms with recent body designs are referred as higher organisms
 - C. Older organisms are simpler while younger organisms are more complex
 - D. Primitive organisms have not changed very much.
13. Which of the following pairs is incorrectly matched?
- A. Ligament - Yellow elastic tissue
 - B. Cartilage - Adipose connective tissue
 - C. Lymph - Fluid connective tissue
 - D. Bone - Skeletal connective tissue
14. In the year 1665, an English scientist observed for the very first time that living things appear to consist of separate units called little rooms'. Identify the botanist and the units observed by him___?
- A. Leeuwenhoek and Protoplasm
 - B. Robert Brown and Cell
 - C. Purkinje and Protoplasm
 - D. Robert Hooke and Cell
15. According to Rutherford, the nucleus of an atom?
- A. Has a positive charge and contains most of the mass of the atom
 - B. Has a negative charge and contains most of the mass of the atom
 - C. Is not a definite point in space; rather it is a cloud of smaller particles called quarks that deflect alpha particles
 - D. Orbits around a definite point in space made of neutrons and electrons

16. Read the following passage and answer?

Water gas is an equimolar mixture of hydrogen and carbon monoxide. If 250 litres of water gas is burnt in air, calculate the following assuming both reactants and products are at same temperature and pressure. $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$; $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ Volume of carbon dioxide produced

- A. 125 litres B. 62.5 litres C. 250 litres D. 500 liters

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

Statement 1: All homogeneous substances are pure.

Statement 2: Alloys are homogeneous mixtures of solids.

- 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 1 is false and statement 2 is true

18. Which of the following statements is not true?

- A. A mixture of water and milk can be separated by filtration
 B. A mixture of powdered salt and sugar can be separated by fractional crystallization
 C. Loading is a process which involves alum
 D. Salt from sea water is obtained by evaporation.

19. Which of the following statements is incorrect?

- A. Solids have minimum kinetic energy
 B. Gases have the maximum rate of diffusion
 C. Density is maximum for the liquid state
 D. Particles in solid state have only vibrating motion

20. Which of the following does not increase the rate of evaporation?

- A. Increase of temperature
 B. Increase in wind speed
 C. Increase in surface area
 D. Increase in humidity

ANSWER KEYS

QUESTION NO.	1	2	3	4	5	6	7	8	9	10
ANSWERS	C	A	B	B	B	B	C	C	A	A
QUESTION NO.	11	12	13	14	15	16	17	18	19	20
ANSWERS	B	A	B	D	A	A	D	A	C	D

Invigilator's Signature



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