

SCIENCE OLYMPIAD

PRACTICE BOOK



GRADE
8

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Preface



Our education system effectively provides an introduction to the concepts of Math and Science and helps us understand the underlying concepts. But in its overly generalized approach, which aims to enlighten and test all students of varying caliber and interests, it leaves the exploration of application of all these concepts completely on the students.

This workbook is designed to enable students to explore Science effectively. Designed in accordance with the requirements of the Science Olympiads, the workbook is an efficient tool to achieve comprehensive success at the **ISFO – Science Olympiad**.

The main aim of this workbook is to assist students in developing and improving their ability to solve problems.

Each chapter of the book consists of 3 sets of questions.

- **Section A** (Scientific Reasoning) : This section is created to test the knowledge of scientific concepts and topics pertaining to the respective grades.
- **Section B** (Everyday Science) : This section deals with the application of the concept learnt.
- **Section C** (BrainBox) : Questions to prepare students with HOTS (Higher Order Thinking Skills), based on the syllabus provided.

Logical Reasoning section is provided to equip students with verbal and non-verbal analysis and reasoning skills.

Sample Test Papers and Answer keys have been provided to accelerate the learning process.



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Crop Production and Management

- ⇒ We need to adopt certain agricultural practices in order to provide food to our growing population day by day.

Plants of the same kind grown and cultivated at one place on a large scale for food, clothing, medicines, cosmetics, dyes, etc. are called crops. In India, crops are categorised into two types on the basis of seasons; that is, Rabi and Kharif crops. The crop production practice involves a series of processes which are as follow :

- Preparation of soil by tilling and levelling
- Sowing of seeds into the prepared soil
- Adding manure and fertilisers for replenishment and enrichment of soil, ensuring healthy growth of crops
- Supplying of water to crops at appropriate intervals, called as irrigation
- Protecting crops from weeds by using weedicides
- Harvesting of crops by machines and their proper storage to protect them from harmful effects of pests and microorganisms

Like plants, animals also provide us with a large variety of food items for which they are reared at homes or in farms. They are provided with proper food, shelter and care, which is called animal husbandry

SECTION - A : SCIENTIFIC REASONING

1. Continuous growing of crops makes the soil poorer and less-fertile. We can replenish soil by the following method.
 - a. Adopting crop rotation
 - b. Using weedicides
 - c. Levelling
 - d. Ploughing
2. Frequency of watering should be higher in the summer season due to:
 - a. Increased evaporation from soil.
 - b. Decreased evaporation from soil.
 - c. Decreased rainfall.
 - d. Increased wastage of water by plants
3. It is important to make the soil loose because it
 - a. Removes insects from soil.
 - b. Allows the stem to be more erect.
 - c. Holds more air and water.
 - d. Requires less manure.
4. The precaution for preventing seeds from insects can be taken by:
 - a. Sowing them properly.
 - b. Rejecting the unhealthy plants.
 - c. Timely inspection of the store houses.
 - d. Spraying chemicals beforehand.
5. The seeds selected for sowing should be
 - I. Clean and healthy
 - II. Disease resistant
 - III. Bigger in size
 - IV. Freshly stored
 - a. I and II
 - b. II and IV
 - c. Both a. and b.
 - d. III and IV
6. Which of the following gases is evolved in the process of anaerobic digestion of organic waste?
 - a. Oxygen gas
 - b. Nitrogen gas
 - c. Water gas
 - d. Biogas
7. Which of the following represents an odd combination?
 - a. Chilli, tomatoes and paddy
 - b. Coffee, tea and rubber plant
 - c. Seed drills, hoe and wild bramble
 - d. Rice, maize and sorghum
8. Growth and multiplication of microorganisms is better in:
 - a. Wet soil because it allows multiplication due to the presence of air.
 - b. Dry soil because it allows multiplication due to the absence of air and water.
 - c. Tight soil because it allows multiplication due to the presence of air and water.
 - d. Loose soil because it allows multiplication due to the presence of air and water.
9. The different measures which help to increase crop yield are:
 - a. Improving soil fertility by scientific methods and protection of plants from pests and weeds.
 - b. Following suitable agricultural practices and control of plant diseases.
 - c. Using good quality seeds and awareness of new agricultural technology.
 - d. All of these

10. The role of fertilizer is to:
- Provide with specific nutrients required by the soil/crop.
 - Cause rapid development of crops.
 - Get absorbed in the soil.
 - Provide the soil with economical agricultural practices.
11. The seeds should be sown at a particular depth, because:
- This will enable the farmer to check the seeds easily.
 - It prevents the loss of seeds.
 - It leads to better germination of seeds.
 - It provides with abundant supply of water to the seeds.
12. A major disadvantage of using fertilisers is that:
- They are made only by chemicals.
 - Their overuse may harm the soil.
 - They are nutrient specific.
 - Their frequency of use is limited
13. Which of the following statements is incorrect?
- Harvesting is done at the final stage of the agricultural task, wherein the fully grown plant needs cutting.
- b. It involves cutting and gathering of the mature crops.
- c. It is done by mechanical harvesters or combine.
- d. Grains are harvested manually by hand picking.
14. Identify the traditional method(s) of irrigation from among the following list.
- I. Moat II. Chain pump
III. Sprinkler system IV. Dhekli
a. I and II b. III and IV
c. I, II and IV d. I, II and III
15. Arrange the following in a proper sequence, representing the correct order of production of cotton crop.
- I. Sowing of cotton seeds
II. Manuring
III. Ploughing the field
IV. Preparation of the soil
V. Sending crops to the cotton factory
VI. Irrigation
VII. Harvesting
- a. IV, II, III, I, VI, VII, V
b. IV, III, I, II, VI, VII, V
c. V, III, I, II, VI, VII, IV
d. IV, II, I, III, VI, VII, V

SECTION - B : EVERYDAY SCIENCE

16. Raghu is a farmer. By mistake, he sowed wheat in kharif season. What will be the effect of this mistake made by Raghu on the wheat crop and the soil?
- I. Air in the soil space in which wheat is sown will reduce because of rainfall and waterlogging in kharif season.
- II. This will not allow the germination of wheat seeds in the kharif season.
- a. I is correct and II is the correct explanation of I.
b. I is incorrect and II is correct.
c. Both I and II are incorrect.
d. I is correct and II is the incorrect explanation of I.
17. Indian farmers are unhappy over the introduction of “Terminator Seed Technology” because the seeds produced by this technology are expected to:

- a. Give rise to sexually sterile plant.
 - b. Give rise to low-yielding plants despite the high quality.
 - c. Show poor germination.
 - d. Give rise to the plants that are incapable of forming viable seeds.
18. Akshat placed a few healthy seeds in three pots A, B & C containing same type of soil. The soil in pot 'A' is mixed with green leaves, the soil in pot 'B' is mixed with old cow dung while the soil in pot 'C' is mixed with chemical fertilizer. All the three pots were watered regularly and given proper environment for plant growth. What would Akshat observe after 10–15 days?
- a. Lot of growth in pot 'C' with replenishment of all nutrients.
 - b. Lot of growth in pot 'B' with replenishment of all nutrients.
 - c. Lot of growth in pot 'A' without replenishment of the nutrients.
 - d. No growth in pot 'A'.

19. Vinay wants to practice crop rotation in his field. Which of the following rabi and kharif crops will replenish his field with nitrogen?

	Rabi Crop	Kharif Crop
a.	Maize, Paddy, Soyabean	Wheat, Pea, Mustard
b.	Wheat, Pea, Mustard	Maize, Paddy, Soyabean
c.	Barley, Paddy, Wheat	Mustard, Soyabean, Gram
d.	Barley, Maize, Paddy	Mustard, Soyabean, Gram

20. Now-a-day, every second person, in urban area, talks about organic food. Grade 8 students decided to produce organic food in schools garden. What should they do?
- a. They should add urea in the soil before sowing seeds.
 - b. They should use manures and not fertilisers.
 - c. They should sprinkle pesticides and weedicides for better production.
 - d. Both a. and c.

SECTION - C : BRAINBOX

21. Which of the following statements is/are correct, regarding the storage of food?
- I. The safety measure used for the storage of grains since a long time is that the grains should be properly dried in the sun to reduce moisture because moisture increases the growth of organisms.
 - II. At home, we could use dried Neem leaves to store the food grains.
 - III. For storing large quantities of grains in big godowns, specific chemical treatments are required to protect them from pests and microorganisms.
- a. I and II
 - b. I, II and III
 - c. Only II
 - d. II and III

22. Match list I with list II and select the correct answer using the codes given below the lists:

List I	List II
a. Barley	1. Hot and dry climate with poor soil
b. Rice	2. Cool climate with poorer soil
c. Millets	3. Warm and moist climates with high altitude
d. Tea	4. Hot and moist climate with rich soil

A B C D

- a. 2 1 4 3
b. 3 4 1 2
c. 2 4 1 3
d. 3 2 4 1

23. Which of the following statements are correct about the plough?

- I. The plough contains a strong triangular iron strip called a ploughshare
II. The main part of the plough is a long log of wood which is called a ploughshaft.
III. In earlier days, ploughs were drawn by working animals such as horses or cattle, but in modern times ploughs are drawn by tractors.
- a. I and II
b. I and III
c. I, II and III
d. II and III

24. Crop production and management is necessary because:

- I. All animals including human beings are dependent on plants for their food.
II. As our population increases day by day, requirement of food also increases.
III. Agriculture is the only source of livelihood for many people.

Mark the correct option.

- a. I and II b. I and III
c. I, II and III d. II and III

25. Manures are considered better than fertilisers, because they:

- I. Provide humus to the soil.
II. Are slowly absorbed by the plants.
III. Make the soil porous which allows exchange of gases in the soil.
IV. Decrease the number of microbes.
- a. I and II b. II and IV
c. I, II and III d. III and IV

Darken your choice with HB pencil -

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. a b c d
7. a b c d

8. a b c d
9. a b c d
10. a b c d
11. a b c d
12. a b c d
13. a b c d
14. a b c d

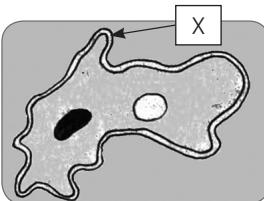
15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. a b c d

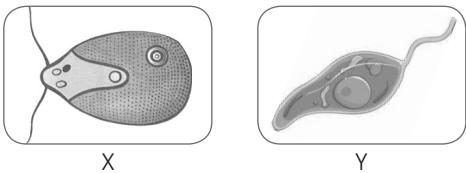
22. a b c d
23. a b c d
24. a b c d
25. a b c d

Microorganisms: Friends and Foes

- Microorganisms are so small that we cannot see them with unaided eyes. They are found in air, water and inside the bodies of plants and animals.
- They can live in all kinds of environments ranging from very cold climate to hot springs and deserts to marshy areas.
- They may be unicellular or multicellular.
- Microorganisms are broadly classified into four major groups, namely, bacteria, fungi, protozoa and some algae.
- Viruses are quite different from other microorganisms. They are non-living outside the host cell but as soon as they enters the host cell they become living by showing all characteristics of living organisms.
- Microorganisms are very useful to us; some are used in the commercial production of medicines and alcohol while some are eco-friendly and help in cleaning our environment.
- Some microorganisms are harmful as they cause serious diseases in plants and animals. Some of the microorganisms grow on our food stuff and cause food poisoning.
- Some microorganisms reside in root nodules of leguminous plants and fix and convert the atmospheric nitrogen into nitrates and increase soil fertility.

SECTION - A : SCIENTIFIC REASONING

1. My mother asked me to cover my mouth and nose while sneezing as I was suffering from a :
 - a. Hereditary disease
 - b. Sexually transmitted disease
 - c. Communicable disease
 - d. Congenital disease
2. Which of the following is a simplest protozoan?
 - a. Amoeba
 - b. Paramecium
 - c. Euglena
 - d. Plasmodium
3. Which of the following statements is correct about plant diseases?
 - a. Serious plant diseases caused by fungi can wipe out the whole crop.
 - b. Plants are being developed through biotechnology and hybridization to have resistance against diseases.
 - c. Plant diseases like rust, smut and wilt are caused by fungi.
 - d. All of these
4. X is a medicine which is made with the help of microorganisms mainly fungi and bacteria and used in killing or stopping the growth of the disease-causing microorganisms. Here X can be:
 - a. Vaccines
 - b. Antibiotics
 - c. Antipyretic drugs
 - d. Analgesic
5. Statins used as blood cholesterol lowering agents are produced by a microbe called:
 - a. *Bacillus thuringiensis*
 - b. *Anabaena affinis*
 - c. *Sesbania drummondii*
 - d. *Monascus purpureus*
6. Bacteria present in the root nodules of leguminous plants which fix atmospheric nitrogen to be used by the plant is
 - a. Rhizobium
 - b. Nostoc
 - c. Azospirillum
 - d. Acetobacter
7. Tina bought a packet of pasteurized milk and drank without boiling it because it
 - a. Tasted sweet
 - b. Was free from microorganisms
 - c. Was rich in minerals and vitamins
 - d. Was proteinaceous in nature
8. Once a person is infected with smallpox, he does not suffer from it again as his body contains:
 - a. Antigens
 - b. Antibodies
 - c. Anticoagulants
 - d. Antibiotics
9. Which of the following is correct about the part labelled as X in the given diagram?
 - I. It is meant for feeding.
 - II. It is meant for locomotion.
 - III. It is meant for food preparation.
 - a. I and II
 - b. II and III
 - c. Only II
 - d. Only III
10. Leptothrix is an example of iron bacteria. Which of the following statements best fits the iron bacteria?
 - a. They oxidise ferrous compounds to ferric oxide.
 - b. They are responsible for the preservation of iron-rich artefacts in archaeological material.
 - c. They cause rusting of iron.
 - d. They cause iron to be deposited in the liver of animals.

11. There are more anti-bacterial drugs than anti-viral drugs because:
- Virus is smaller than bacteria.
 - Viral diseases are intracellular.
 - Bacterial diseases are intracellular.
 - Drugs can penetrate bacteria more effectively.
12. Study the given pictures of organisms and choose the incorrect statement regarding these.
- 
- X Y
- Organism 'X' is a unicellular green alga.
 - Organism 'Y' is a parasitic protozoan.
 - Organism 'Y' causes diseases in humans.
 - Both the organisms cannot synthesize their own food.
13. A bacterium undergoes a binary fission every minute. This bacterium can fill up a jar in 1 hour. How much time it would take to fill the jar exactly half?
- a. 20 minutes b. 30 minutes
 c. 40 minutes d. 59 minutes
14. Read the given correlation and complete it.
- | | |
|--------------------|-------------------|
| Heat treatment : : | Sterilisation : : |
| Vaccination : P | |
- What is 'P' here?
- Pasteurisation
 - Immunisation
 - Fertilization
 - Inoculation
15. Which of the following statements is/are incorrect about microorganisms?
- Microorganisms are found everywhere in all kinds of environment.
 - Microorganisms can withstand high and low temperatures.
 - Microorganisms have high degree of adaptability.
 - To tolerate unfavourable conditions, microorganisms' cells get covered with a hard outer covering called cysts.
- I and II
 - II and III
 - I, II, III and IV
 - None of these

SECTION - B : EVERYDAY SCIENCE

16. Riya had a severe stomach ache last night. She had been vomiting all night. Doctor said that it had happened due to food poisoning
- Food poisoning could be due to the consumption of food spoilt by some microorganisms.
 - Microorganisms that grow on our food sometimes produce toxic substances which cause food poisoning.
 - Toxic substances make the food poisonous, causing serious illness and even death.
 - Both a. and c.
17. Rahul stays at a place where water keeps stagnating, allowing mosquitoes to breed. He is in danger of contracting:
- Hepatitis B
 - Typhoid
 - Malaria
 - Tuberculosis
18. Riya is doing an activity in a biological lab. She and her team mates allowed growth of yeast on natural sugars present in grains like barley, wheat, rice, crushed fruit juices. The result of this activity would be:
- Formation of beer
 - Formation of wine

- c. Formation of cider
d. All of these
19. Which of the following represents an incorrect match?
- | Human Disease | Causative Micro-organism | Mode of Transmission |
|-----------------|--------------------------|----------------------|
| a. Tuberculosis | Virus | Air |
| b. Polio | Virus | Air/water |
| c. Malaria | Protozoa | Mosquito |
| d. Typhoid | Bacteria | Water |
20. Which of the following is correct regarding the application of biopesticides?
- Bacillus thuringiensis* is a bacterium that kills insect.
 - Trichoderma, a fungus, controls many pathogenic fungi present in the soil.
 - Certain bacteria and fungi are being used to control certain weeds and diseases in crop plants.
 - All of these

SECTION - C : BRAINBOX

21. Virus is a connective link between the living and the non-living because
- The reason for their being non-living is that they neither grow nor reproduce once outside the host cell.
 - They can be considered living as they multiply very fast and grow when they are inside the host cell.
- Only I
 - Only II
 - Both I and II
 - None of these
22. Match the following and choose the correct option for this.
- | Column – I | Column – II |
|----------------------------|-------------|
| i. Citrus canker | a. Fungi |
| ii. Rust of wheat | b. Virus |
| iii. Insect mosaic of okra | c. Bacteria |
| iv. Chicken pox | |
- i-c, ii-a, iii-b, iv-b
 - i-a, ii-b, iii-b, iv-c
 - i-c, ii-b, iii-a, iv-b
 - i-a, ii-d, iii-c, iv-b
23. Observe the cell walls shown in the figure. Here figure I represents
-
- I II
- I. Actinomyces II. *Bacillus*
 III. Lactobacillus IV. *E. coli*
 V. Nitrobacter
- I and III
 - II and IV
 - I, II and III
 - III and V
24. Which of the following is correct about the organism shown in the given image?
-
- GREEN layer on pond surface
- These are a very large and diverse group of simple, typically heterotrophic organisms, ranging from unicellular to multicellular forms.
 - Most of them photosynthesize like plants.
 - They reproduce either by asexual cell division or by sexual reproduction.
 - All of these organisms have photosynthetic machinery ultimately derived from cyanobacteria and so they are able to produce a gas as a by-product of photosynthesis.
- I and II
 - I and III
 - II, III and IV
 - II and IV

25. Study the given diagram of bacteria P, Q and R.

Identify these bacteria and find the correct match regarding diseases caused by these bacteria.



P



Q



R

	P	Q	R
a.	Lactobacillus- a friendly bacteria	<i>Salmonella typhi</i> - causes Typhoid fever.	Streptococcus- causes throat trofosis
b.	Streptococcus- a disease causing organism	Lactobacillus- a friendly bacteria	<i>Salmonella typhi</i> - causes tuberculosis
c.	Streptococcus- a disease causing organism	Lactobacillus- a friendly bacteria	Pseudomonas- a friendly bacteria
d	Lactobacillus - a disease causing bacteria	<i>Salmonella typhi</i> - caus- es many disease	Streptococcus- a friendly bacteria

Darken your choice with HB pencil -

1. a b c d

2. a b c d

3. a b c d

4. a b c d

5. a b c d

6. a b c d

7. a b c d

8. a b c d

9. a b c d

10. a b c d

11. a b c d

12. a b c d

13. a b c d

14. a b c d

15. a b c d

16. a b c d

17. a b c d

18. a b c d

19. a b c d

20. a b c d

21. a b c d

22. a b c d

23. a b c d

24. a b c d

25. a b c d

Synthetic Fibres and Plastics

⇒ Fibres are used for making a large variety of household articles

- Natural fibres like cotton, wool, silk, etc., are obtained from plants and synthetic fibres are made by human beings by chemical processing of petrochemicals.
- Like natural fibres, synthetic fibres and plastics are made of very large units called polymers and polymers are made of many smaller units.
- Synthetic fibres are used for making many household articles like rope, bucket, container, furniture, etc. They are also used in aircrafts, ships, spacecrafts, healthcare, etc.
- Different fibres have different strength, nature of burning, water absorbing capacity, cost, durability, etc.
- Synthetic fibres are of different types depending upon the chemical used in their manufacturing. They are nylon, rayon, polyester and acrylic.
- Plastics find extensive use in the healthcare industry like for packaging of tablets, for making thread used for stitching wounds, syringes, etc.
- Plastic takes several years to decompose. It is not environment friendly and causes environmental pollution, and so we should avoid using plastics as far as possible.

SECTION - A : SCIENTIFIC REASONING

1. X is a synthetic fibre made of a chemical called terephthalic acid. It is used for clothing, sheets, ropes, sails, etc.

Here X is:

- a. Rayon
- b. Terelene
- c. Nylon
- d. Acrylic

2. Which of the following statements is correct about acrylic?
- a. It appears to resemble wool.
 - b. It is a synthetic fibre.
 - c. Woollen clothes made from acrylic are relatively cheaper than the clothes made from naturally obtained wool.
 - d. All of these

3. Polyester is made of repeated units of chemical called:
- a. Ether
 - b. Ester
 - c. Acid
 - d. Alcohol

4. Name two plastics which get deformed easily on heating and can be bent easily.
- a. Elastomers and monomers
 - b. Polythene and PVC
 - c. Thermoplastics and thermosetting plastics
 - d. None of these

5. Orlon is a:
- a. Polymer of vinyl cyanide
 - b. Polymer of vinyl chloride
 - c. Polymer of chloroprene
 - d. Polymer of ethyl chloride

6. The synthetic polymer used for the coating of non-stick cookware is a non-reactive polymer.

This is because of:

- a. The strength of carbon-sulphur bonds.
- b. The strength of carbon-fluorine bonds.
- c. The strength of carbon bonds.
- d. None of these

7. Polymer which is also known as teflon is:
- a. Bakelite
 - b. Polythene
 - c. Polytetrafluoroethylene
 - d. Buna-S
8. Nylon-66 is made from hexamethylene tetramine (having six methyl group) and:
- a. Sulphurous acid with six atoms of various elements.
 - b. Adipic acid, a six carbon chain fatty acid.
 - c. Sulphur hexafluoride with six fluorine atoms.
 - d. Cobalt hexamine cation with six ammonia ligands.
9. Which of the following holds true for rayon fiber?
- I. Rayon is synthesized from wood pulp.
 - II. Rayon resembles silk. So, it is also known as artificial silk.
 - III. Rayon can be dyed in different colours.
 - IV. Rayon is cheaper compared to silk.
- a. I and II
 - b. II, III and IV
 - c. I, II, III and IV
 - d. None of these
10. Why melamine is used in making floor tiles?
- I. Melamine is a versatile material.
 - II. It resists fire and can tolerate heat better than other plastics.
- a. Both I and II
 - b. Only I
 - c. Only II
 - d. None of them

11. What are the factors that differentiate the different types of fibres?
- Strength
 - Water absorbing capacity
 - Nature of burning
 - Cost
 - Durability
 - I, II, III and IV
 - II, III and IV
 - I, II, III, IV and V
 - III and V
12. Why should we wear cotton clothes in summer?
- Cotton allows better air circulation, which helps in absorbing and removing body moisture caused by sweat.
 - Cotton is light in weight and is of light colour unless it is dyed. The light colour of the cotton cloth helps the light to pass through instead of being absorbed and hence we do not feel the much heat.
 - Cotton helps in bringing down the severity of any allergic reaction and is perfect for those who have sensitive skin.
 - All of these
13. Match column A with B and choose suitable option for this.
- | Column 'A' | Column 'B' |
|-------------------------------|--------------------------|
| i. Jute | A. First synthetic fibre |
| ii. Rayon | B. Natural fibre |
| iii. Nylon | C. Polymer |
| iv. Repetition of small units | D. Terylene |
| v. Polyester | E. Wood-pulp |
- i- A, ii-E, iii-B, iv-C, v-D
 - i- B, ii-E, iii-A, iv-C, v-D
 - i- C, ii-A, iii-B, iv-E, v-D
 - i- A, ii-E, iii-B, iv-D, v-C
14. You have to take extra care to iron synthetic clothes because
- They take long time to give a smooth look.
 - They got damaged at high temperature.
 - They need more water for ironing.
 - They are wrinkle free.
15. Which of the following groups contains all synthetic substances?
- Nylon, Terylene, Wool
 - Cotton, Polycot, Rayon
 - Acrylic, Bakelite, Polythene
 - Silk, Wool, Acrylic

SECTION - B : EVERYDAY SCIENCE

16. Uniforms of firemen are made up of melamine because:
- Melamine resists fire and can tolerate heat better than other plastics.
 - Melamine is a good conductor of heat.
 - Melamine allows air to pass through it.
 - I and II
 - II and III
 - Only I
 - None of these
17. Plastic containers are preferred over iron containers for storing food because plastic is
- Non-reactive
 - Durable
 - Cheap and light in weight
 - Corrosion resistant
 - I and II
 - II and III
 - III and IV
 - All of these

18. Why should we avoid clothes made of synthetic fibres in hot and humid weather?
- Synthetic fibres catch fire very easily.
 - Synthetic fibres may cause rashes, skin allergies and body odour as they tend to trap moisture.
 - Synthetic fibres stick to the body.
 - Synthetic fibres do not absorb sweat.
- a. I , II and III b. II, III and IV
c. Only II d. None of them
19. Zoei took few synthetic and natural fibres to study the effect of their burning. She took nylon, wool, cotton, silk threads and polyester and burnt them one by one. Choose the suitable option predicting the observation of her experiment.
- a. Cotton and wool burn to form a residue.
b. Wool and silk burnt with the smell of burning hair.
- c. Nylon and polyester melt on burning.
d. All of these
20. The disadvantages of using synthetic fibres are –
- They are cheap and affordable.
 - They are wrinkle free and thus, do not need ironing.
 - They do not need maintenance like natural fibres.
 - They melt easily and are prone to heat damage.
 - They dry quickly and do not shrink.
 - They are more elastic as compared to natural fibres.
- a. Only II
b. Only IV
c. Only V
d. Both IV and VI

SECTION - C : BRAINBOX

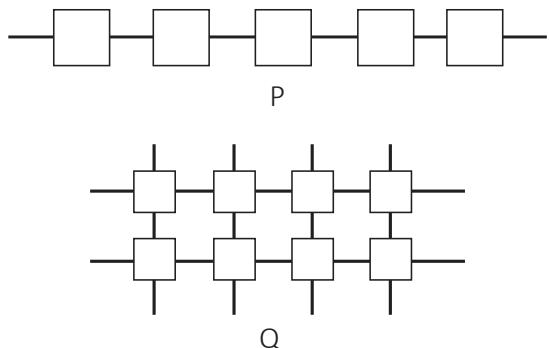
21. Preweighed pieces of cloth of nylon, cotton, silk and wool of equal measurements are taken and soaked in a beaker filled with water. After a few minutes, the cloth pieces were taken out of the beaker and weighed again. Which of the following options places them in the correct order of their final weights?
- a. Nylon > cotton > silk > wool
b. Wool > cotton > silk > nylon
c. Wool > silk > cotton > nylon
d. Cotton > wool > silk > nylon

22. X is a source of synthetic polymers. It is a mixture of a number of carbon compounds which can be separated by the process of fractional distillation.

Here X could be

- a. Petrol
b. Petroleum
c. Diesel
d. Coal tar

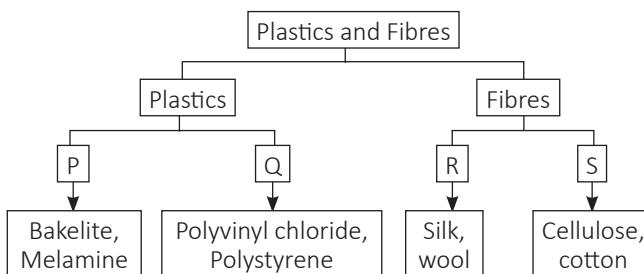
23. Observe the diagram shown below and choose correct option for this.



- I. Figure P shows the structure of a monomer while figure Q shows the structure of a polymer.
- II. Small boxes in the above structures represent monomers which are joined to give a polymer.
- III. Figure P shows the structure of a linear polymer while Q shows the structure of a cross-linked polymer.
- a. I and II
b. I and III
c. II and III
d. All of these
24. A student studied about the materials that are used for making plugs and switches.
 P → A thermosetting which is used for making plugs and switches.
 Q → A thermoplastic used as an insulation for electric wires.
 R → A thermoplastic which can be rolled into sheets.
 What are P, Q and R?

P	Q	R
a. PVC	Polythene	Bakelite
b. Polyethylene	PVC	Bakelite
c. Bakelite	Melamine	Teflon
d. PVC	Melamine	Teflon

25. Observe the classification shown below and choose the suitable options for P, Q, R and S.



P	Q	R	S
a. Thermosetting	Thermoplastics	Animal fibres	Plant fibres
b. Thermoplastics	Thermosetting	Plant fibres	Animal fibres
c. Non-biodegradable	Biodegradable	Animal fibres	Rayon
d. Biodegradable	Non-biodegradable	Plant fibres	Animal fibres

Darken your choice with HB pencil -

1. a b c d 8. a b c d 15. a b c d 22. a b c d
2. a b c d 9. a b c d 16. a b c d 23. a b c d
3. a b c d 10. a b c d 17. a b c d 24. a b c d
4. a b c d 11. a b c d 18. a b c d 25. a b c d
5. a b c d 12. a b c d 19. a b c d
6. a b c d 13. a b c d 20. a b c d
7. a b c d 14. a b c d 21. a b c d

Coal and Petroleum

⇒ Natural resources can be broadly classified into inexhaustible natural resources and exhaustible natural resources.

- Coal, petroleum and natural gas are exhaustible natural resources.
- Coal, petroleum and natural gas are called fossil fuels because they are formed from dead remains of living organisms.
- Coke, coal tar and coal gas are the products of coal.
- Coke is an almost pure form of carbon.
- Coal tar has an unpleasant smell and is mixture of about 200 substances.
- Petrol and diesel are obtained from a natural resource called petroleum.
- Petroleum gas, petrol, diesel, kerosene, paraffin wax and lubricating oil are obtained by the refining of petroleum.
- We should make wise and judicious use of exhaustible resources.

SECTION - A : SCIENTIFIC REASONING

1. The buried dead plants get converted to _____ due to high temperature and pressure underneath the Earth.
 - a. Metal
 - b. Coal
 - c. Bacteria
 - d. Rocks
2. Which of the following happens in carbonisation?
 - a. Carbon gets liberated into nature.
 - b. Dead vegetation is converted to coal.
 - c. Carbon is formed from nature.
 - d. Carbon is formed from coal.
3. The dead aquatic organisms that were buried under the sand and clay of the sea bed, were converted to petroleum owing to _____.
 - a. High pressure
 - b. High temperature
 - c. Absence of air
 - d. All of these
4. Choose the correct statement from the following
 - a. It is difficult to transport natural gas through pipes.
 - b. The disadvantage of natural gas is that it cannot be used directly for burning in homes.
 - c. Natural gas is stored under high pressure as compressed natural gas.
 - d. Natural gas cannot be used for power generation.
5. Which of the following is known as chief antiknock agent for automotive gasoline?
 - a. Tetraethyl lead
 - b. Tetramethyl lead
 - c. Tetraethylene lead
 - d. Tetrapropyl lead
6. Gross and net calorific values of a fuel will be the same:
 - a. Under no circumstances.
 - b. If its carbon content is very low.
 - c. If its ash content is zero.
 - d. If its hydrogen compound content is zero.
7. Higher percentage of ash in coal meant for the production of metallurgical grade coke:
 - a. Decreases the hardness of coke.
 - b. Decreases the abrasion resistance of coke.
 - c. Causes brittleness in steel.
 - d. None of these
8. Which of the following is not a by-product recovered in a high temperature coal carbonisation plant?
 - a. Pitch-creosote mixture (PCM)
 - b. Benzol
 - c. Naphthalene
 - d. Ethylene
9. A coal with high ash content is undesirable, as:
 - a. The ash in molten condition gets absorbed in the pores of the refractory lining of the furnace and causes its spalling due to different co-efficient of expansion/contraction of the refractory and the ash.
 - b. It is abrasive to the coal pulveriser (e.g. ball mill) and the combustion chamber.
 - c. The ash retains the sulphur and phosphorus and thus affects the quality of products in a metallurgical furnace; apart from increasing the slag volume, It may fuse and stick to the boiler tubes, thereby reducing the heat transfer.
 - d. All of these

10. The temperature at which plastic layer formation takes place during carbonisation of coal varies from _____ °C.
- 100 to 150
 - 550 to 650
 - 350 to 450
 - 700 to 850
11. A fuel containing carbon and carbon monoxide (but containing no hydrogen or its compounds) is burnt in pure oxygen at a constant pressure. Its gross calorific value as compared to net calorific value will be
- Less
 - Same
 - More
 - Data insufficient; can't be predicted
12. The petroleum product used as a solvent for drycleaning is
- Kerosene
 - Petrol
 - Diesel
 - Paraffin
13. Petroleum is called black gold because:
- Of its appearance as black oily liquid.
 - Of its great commercial importance.
 - Only I
 - Only II
 - Both I and II
 - None of these
14. Which of the following shows the correct usage of petroleum products?
- Coke is used in the manufacture of steel and in the extraction of many metals.
 - Coal tar is used for metalling the roads.
 - Coal gas is used as a fuel in many industries situated near the coal processing plants.
 - All of these
15. Which of the following is the feature of a good quality coal?
- Low fusion point of ash
 - High ash content
 - High sulphur
 - None of these

SECTION - B : EVERYDAY SCIENCE

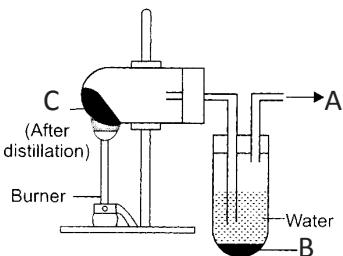
16. Coal tar can be used as a starting material for the manufacturing of :
- Drugs
 - Cookwares
 - Photographic materials
 - All of these
17. Match Column I with Column II and find the incorrect match.
- | Column I | Column II |
|-----------------|----------------|
| a. Black Gold | Petroleum |
| b. Paraffin wax | Vaseline |
| c. Bitumen | Road surfacing |
| d. Coke | A natural gas |
18. Coke is a fuel with few impurities and light carbon content. Which of the following is not a use of coke?
- It is used as a reducing agent.
 - It is used in the manufacture of steel.
 - It is used in the manufacture of coal gas.
 - It is used in the manufacture of producer gas.
19. Choose the incorrect statement.
- Oxygen in the air is an exhaustible natural resource.
 - Wildlife is an exhaustible natural resource.
 - CNG is a less polluting fuel than petrol and diesel.

- d. Under high temperature and pressure, dead plants get slowly converted to coal.
- 20.** Petroleum is a non-renewable source of energy. Which of the following steps are suggested for the judicious fuels?
- We should use fossil fuels when necessary.

- We should use natural gas as a substitute.
- Alternative sources of energy such as solar, wind and biomass should be preferred.
- All of these

SECTION - C : BRAINBOX

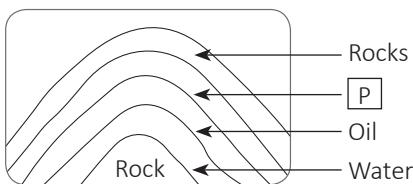
- 21.** Study the given diagram of destructive distillation of coal.



Identify the useful products obtained.

	A	B	C
a.	Coal gas	Coal tar	Coke
b.	Coal gas	Coke	Coal
c.	Coal gas	Coal tar	Impure coal
d.	CO_2	Coal tar	Coal

- 22.** Study the given diagram showing petroleum and natural gas deposits.



Which of the following is a correct statement about the component P?

- It is made of methane gas.
- It is a clean and non-polluting fuel.
- It is a gas and stored under high pressure.
- All are correct

- 23.** When air is passed through red hot coke, a gaseous fuel is produced. Which of the following is correct about the fuel?

	Name of the fuel	Composition
a.	Natural gas	$\text{H}_2 + \text{CO}$
b.	Producer gas	$\text{N}_2 + \text{CO}$
c.	Water gas	$\text{CO} + \text{H}_2$
d.	Biogas	$\text{CH}_4 + \text{O}_2$

- 24.** Fill in the blanks and find P, Q, R & S

"The low process of conversion of dead vegetation into coal is called P. Coal and petroleum are formed from the dead remains of organisms and are known as Q. The black thick liquid with unpleasant smell is known as R. The process of separating various constituents of petroleum is known as S.

What are P, Q, R & S?

- P – Coal, Q – Fossil fuels, R – Coal gas, S – Coal tar
- P – Coal, Q – Fossil fuels, R – Coal tar, S – Coal gas
- P – Carbonisation, Q – Fossil fuels, R – Coal tar, S – Refining
- P – Carbonisation, Q – Fossil fuels, R – Coal gas, S – Refining

25. In fractionating column, various fractions are obtained at various heights of the column. As the vapour reach at a height where temperature is equal to or just below the boiling point of that fraction, it will:

- a. Condense to form a liquid.
- b. Remain in gaseous state.
- c. Condense to form a solid.
- d. Escape from the column.

Darken your choice with HB pencil

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. a b c d
7. a b c d

8. a b c d
9. a b c d
10. a b c d
11. a b c d
12. a b c d
13. a b c d
14. a b c d

15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. a b c d

22. a b c d
23. a b c d
24. a b c d
25. a b c d

Combustion and Flame

- The chemical process in which a substance reacts with oxygen to give off heat is called combustion.
- The substance which undergoes combustion is called combustible substance or fuel. Fuel may be solid, liquid or gas.
- The lowest temperature at which a substance catches fire is called its ignition temperature.
- Substances which have very low ignition temperature and can easily catch fire with a flame are called inflammable substances; like petrol, LPG, etc.
- The three essential requirements for producing fire are fuel, air and heat. Fire can be controlled by removing one or more of these requirements.
- There are three types of combustions, namely, rapid combustion, spontaneous combustion and explosion.
- An ideal fuel is cheap, readily combustible, readily available, having high calorific value and easy to transport.
- Incomplete combustion of fuel releases carbon monoxide gas which is poisonous and harmful for our atmosphere.

SECTION - A : SCIENTIFIC REASONING

1. Flames are formed when the substance:
 - a. Melts during burning.
 - b. Vaporises during burning.
 - c. Boils during burning.
 - d. All of these
2. The heat of combustion of a fuel:
 - a. Is equal to the heat of formation.
 - b. Is always negative.
 - c. Can't be known without calculating it.
 - d. Is always positive.
3. Main constituents of BTX are
 - a. Anthracene and phenol
 - b. Tar and creosote
 - c. Benzene, toluene and xylene
 - d. Ammonia and phenol
4. Higher efficiency in the combustion of solid fuel cannot be achieved by
 - a. Keeping the gas exhaust temperature very high.
 - b. Adopting efficient-fuel firing technique and equipment.
 - c. Proper fuel preparation.
 - d. Supplying correct quantity of combustion air.
5. During combustion of gaseous fuels, deficiency of air:
 - a. Does not affect the flame length.
 - b. Tends to shorten the flame.
 - c. Increases the flame temperature.
 - d. Lengthens the flame.
6. Presence of _____ in a dry gaseous fuel does not contribute to its calorific value.
 - a. Sulphur
 - b. Oxygen
 - c. Carbon
 - d. Hydrogen
7. Low temperature carbonisation:
 - a. Is mainly for producing smokeless domestic coke.
 - b. Produces higher quantity of gas compared to high temperature carbonisation.
 - c. Is meant for the production of 'metallurgical coke'.
 - d. None of these
8. Which of the following is a false statement?
 - a. Ideal fuel is cheap and easily available.
 - b. Complete combustion of a fuel gives carbon monoxide gas.
 - c. Inflammable substances have very low ignition temperature.
 - d. Combustion produces heat and light.
9. Which is not the example of combustion?
 - a. Burning of sodium in air.
 - b. Spontaneous reaction of coal dust in coal mines.
 - c. Reaction of food in our body.
 - d. Reaction occurring in the sun.
10. Match the column 'I' with column 'II':

Column I	Column II
1. CNG	A. Combustible substance
2. LPG	B. Inflammable substance
3. Wood, Charcoal	C. Cleaner fuel
4. Alcohol, Petrol	D. Liquid fuel

 - a. 1-C, 2-D, 3-A, 4-B
 - b. 1-C, 2-D, 3-B, 4-A
 - c. 1-D, 2-C, 3-B, 4-A
 - d. 1-C, 2-B, 3-A, 4-D

11. The correct order of the combustion of the following is:
- Methane > Ethane > Propane > Butane
 - Ethane > Methane > Butane > Propane
 - Butane > Propane > Ethane > Methane
 - None of these
12. Ratio of primary air to secondary air increases with increase in the rank of coal, because the
- Ratio of fixed carbon to volatile matter increases.
 - Calorific value of the coal increases.
 - Oxygen content progressively decreases.
 - High rank coals have higher amount of volatile matter.
13. Improper storage condition results in the weathering of coal and spontaneous combustion, which increases its
- a. Yield of carbonised products.
- b. Friability and oxygen content.
- c. Caking index.
- d. Calorific value.
14. Combustion of pulverised coal as compared to that of lump coal:
- Can be done with less excess air.
 - Develops a non-luminous flame.
 - Provides a lower rate of heat release.
 - Develops a low temperature flame.
15. The head of a safety match contains
- Antimony trisulphide and potassium chlorate.
 - Antimony chloride and potassium sulphide.
 - Antimony carbonate.
 - Potassium sulphide

SECTION - B : EVERYDAY SCIENCE

16. Liquid and gaseous fuels have more advantages over solid fuels. Which of the following is not a correct statement in regard with their advantages?
- Calorific value of liquid and gaseous fuels is higher than that of the solid fuels.
 - Liquids and gaseous fuels have higher ignition temperature than the solid fuels.
 - Liquids and gaseous fuels are easier to store since solid fuels occupy lot of space.
 - Liquids and gaseous fuels burn completely, leaving no residue.
17. Riya's mother was cooking potato curry on a Chulha. She observed that the copper vessel was getting blackened from outside. It may be due to _____.
- Proper combustion of fuel.
 - Improper cooking of potato curry.
 - Improper combustion of fuel.
 - Burning of copper vessels.
18. Aditi, accidentally puts an inverted glass over a lighted candle. She observed that the candle blows off in few seconds. Why does this happen?
- The candle keeps burning as long as air is present in the glass and then it goes off.
 - The ignition temperature of the candle becomes low due to glass cover hence it goes off.
 - The candle keeps burning as long as the complete wax melts away and then goes off.
 - O_2 is produced when candle burns which helps the candle to burn initially.
19. Global warming leads to a rise in sea level which causes floods in the coastal areas. One of the main reasons of global warming is _____.

- a. Combustion of fuels releases SO_2 which increases the temperature.
- b. Combustion of fuels releases CO which decreases the temperature.
- c. Combustion of fuels releases unburned carbon particles which causes decrease in temperature.
- d. Combustion of fuels releases CO_2 which causes increase in temperature.

20. Read the given statements and choose the incorrect one.
- a. Water is a very good fire extinguisher as it cools down the fuels such as wood below its ignition temperature.
 - b. Water is a very good fire extinguisher for burning oils and electrical equipment.
 - c. Sand and soil may act as a good fire extinguisher for burning oils.
 - d. Both a and c

SECTION - C : BRAINBOX

21. Fuel gases containing hydrocarbons (i.e. coke oven gas) are not preheated before burning, mainly because
- a. This reduces its calorific value tremendously.
 - b. The hydrocarbons crack thereby choking and fouling the heat transfer surface by carbon soot.
 - c. This reduces its flame temperature tremendously.
 - d. There are chances of explosion during preheating.

22. Calorific values of some fuels are :

Fuels	Calorific Value (kj/kg)
Diesel	45000
CNG	50000
LPG	55000
Coal	25000 – 33000

Arrange these fuels in correct order of their efficiency.

- a. LPG > CNG > Diesel > Coal
- b. Coal > Diesel > LPG > CNG
- c. Diesel > CNG > Coal > LPG
- d. CNG > LPG > Diesel > Coal

23. When a frying pan containing cooking oil is kept for long on a burning stove then cooking oil catches fire, because:
- a. Its temperature is lower than its ignition temperature.
 - b. Its temperature reaches to its ignition temperature.
 - c. Its temperature is lower than the critical temperature.
 - d. Its temperature is higher than the critical temperature.

24. Match the items of column I with the items of column II

Column I	Column II
p. Oxides of S and N	i) Fire extinguisher
q. CNG	ii) Incomplete combustion of coal
r. O_2	iii) Very low ignition temperature
s. Inflammable substance	iv) Acid rain
t. CO_2	v) Necessary for combustion
u. CO	vi) Fuel for automobiles

Choose the correct option –

- a. p – iv, q – v, r – vi, s – iii, t – ii, u – i
 - b. p – iv, q – vi, r – v, s – iii, t – i, u – ii
 - c. p – iii, q – v, r – iv, s – ii, t – vi, u – i
 - d. p – ii, q – iii, r – iv, s – v, t – vi, u – i
25. Read the given statements about fuels.
- I. The substances which vaporise during burning, giving flame.
 - II. Middle zone is the hottest zone of a flame.
 - III. Greater the calorific value, better is the fuel.

IV. Increased concentration of N₂ in air is believed to cause global warming.

V. Alcohol, CNG and LPG are inflammable substances.

Choose the incorrect statement.

- a. I, II and III
- b. III, IV and V
- c. I, II, III and V
- d. I, III and V

Darken your choice with HB pencil –

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. a b c d
7. a b c d

8. a b c d
9. a b c d
10. a b c d
11. a b c d
12. a b c d
13. a b c d
14. a b c d

15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. a b c d

22. a b c d
23. a b c d
24. a b c d
25. a b c d

Metal and Non-metal

- ⇒ There are 92 elements occurring naturally, out of which 70 are metals and about 22 are non-metals. Some elements show properties of both metals and non-metals; they are called metalloids.
- Metals are solid, hard, malleable and ductile. Metals have high melting and boiling points and are good conductors of heat and electricity
 - Non-metals may be solid, liquid or gas, and are not malleable and ductile. Non-metals have low melting and boiling points and are poor conductors of heat and electricity
 - Metals are sonorous. Metals react with acids to produce metal salts and hydrogen gas; generally non-metals do not react with acids.
 - Some of the metals react with bases to produce hydrogen gas.
 - In an aqueous solution, less reactive metals are displaced by more reactive metals.
 - Metals react with ester to produce metal hydroxides and hydrogen gas.
 - Metals like gold, silver, platinum, etc. retain their lustre because they do not react with air, water or acids. So they are called noble metals.
 - Both metals and non-metals are used widely in our day to day life.

SECTION - A : SCIENTIFIC REASONING

1. The metal present in the hormone insulin is:
 - a. Fe
 - b. Ag
 - c. Zn
 - d. Au
2. X is a non-metal which is used in a purple colour solution considered as an antiseptic solution. Here X is:
 - a. Iodine
 - b. Bromine
 - c. Chlorine
 - d. None of these
3. Which of the following correctly represents decreasing order of the reactivity of the metals?
 - a. Potassium, calcium, zinc, lead
 - b. Calcium, zinc, lead, potassium
 - c. Calcium, lead, zinc, potassium
 - d. Potassium, Calcium, lead, zinc
4. The density of the metals is very high because they:
 - a. Are found in solid state.
 - b. Have closely packed atoms.
 - c. Are malleable.
 - d. Are ductile.
5. Which of the following pairs will give displacement reactions?
 - a. Magnesium chloride solution and aluminium metal.
 - b. Silver nitrate solution and copper metal.
 - c. Ferrous sulphate solution and silver metal.
 - d. Sodium chloride solution and copper metal
6. Potassium carbonate is also known as
 - a. Pearlash
 - b. Oil of vitrol
 - c. Glauber's salt
 - d. None of these
7. The property of the metal that is used to make musical instruments is:
 - a. Ductility
 - b. Malleability
 - c. Conductivity
 - d. Sonority
8. Which of the following reactions is feasible?
 - a. $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$
 - b. $Fe + Zn^{2+} \rightarrow Fe^{2+} + Zn$
 - c. $Mg + Ca^{2+} \rightarrow Mg^{2+} + Ca$
 - d. None of these
9. Which of the following metals will not react completely with dilute sulphuric acid to form a salt and hydrogen gas?
 - a. Calcium
 - b. Lead
 - c. Magnesium
 - d. Sodium
10. Which of the following statements is incorrect about aluminium?
 - a. Aluminium is a chemical element in the Boron group.
 - b. It makes covalent compounds only.
 - c. Aluminum is extracted from its ore bauxite.
 - d. It is soft and brittle.
11. Tooth cavities are filled with alloys of:
 - a. Silver
 - b. Gold
 - c. Zinc
 - d. Aluminium
12. The non-metal which is not affected by caustic soda is:
 - a. Phosphorus
 - b. Silicon
 - c. Sulphur
 - d. Carbon
13. Which of the following is the electronic configuration of metal with a high melting point?
 - a. 2, 1
 - b. 2, 8, 3
 - c. 2, 8, 1
 - d. 2, 8, 8, 1

14. Why phosphorus is kept in water?
- It reacts very fast with atmospheric oxygen and catches fire.
 - It reacts fast with atmospheric nitrogen and catches fire.
 - Phosphorus being very reactive metal, will not be able to react with water molecules.
15. Which of the following oxides cannot be reduced by both hydrogen gas and carbon into its metals?
- CuO
 - PbO
 - ZnO
 - CaO

SECTION - B : EVERYDAY SCIENCE

16. Aluminium is used to make cooking utensils even though it is very high in the reactivity series. Which of the following statements justifies its use as a cooking utensil?
- Aluminium has a much lower density compared to iron.
 - Aluminium loses three valence electrons readily during a chemical reaction.
 - Aluminium has a relatively high melting point compared to other metals.
 - Aluminium can react readily with oxygen in the air to form aluminium oxide.
17. Aman had three containers made of different materials to store pickles.
- 
Earthen jar

Glass jar

Aluminium jar
- Which of these containers is a wrong choice for pickle storage and why?
- Container 'P' because it is made of soil.
 - Container 'Q' because glass is breakable.
 - Container 'R' because it is made of a metal which can react with pickles.
 - All are correct
18. Which of the following statements explains why 99.99% copper is used in manufacturing high quality electrical wires for audio equipment?
- Copper is a good conductor of electricity.
 - Copper which is of a high purity can conduct electric current better.
 - 99.99% copper is almost free of impurities.
 - 99.99% copper is less ductile and cannot be stretched easily.
19. Stainless steel is used to make utensils rather than iron metal. Which of the following properties of stainless steel makes it better than iron?
- Stainless steel is a good conductor and resistant to chemicals.
 - Stainless steel is corrosion free and resistant to chemicals.
 - Stainless steel is durable than iron metal.
 - Both b. & c.
20. Aluminium and its alloys are used to build aircrafts, but not iron. Why?
- Aluminium alloys are lustrous.
 - Iron is non-lustrous.
 - Aluminium alloys are used in aircrafts because they are light weight and corrosion free.
 - Iron is lighter than aluminium metal.

SECTION - C : BRAINBOX

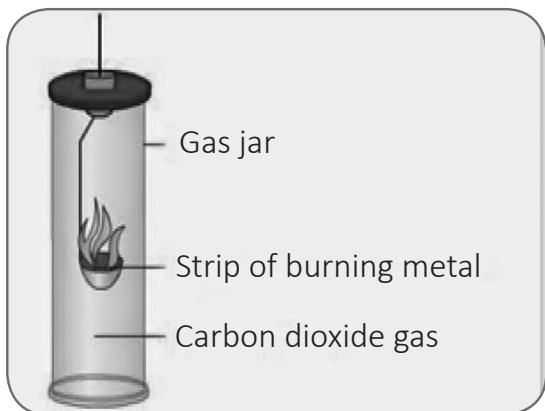
21. The given table shows the reactivity series of metals. Identify correct option for X, Y and Z.

X	
Na	Sodium
Ca	Calcium
Mg	Magnesium
Al	Aluminium
Zn	Zinc
Y	
Sn	Tin
Pb	Lead
Cu	Copper
Mg	Mercury
Z	
Au	Gold

↑
Most reactive
Increasingly reactive
Least reactive

X	Y	Z
a. Potassium	Iron	Silver
b. Iron	Sodium	Diamond
c. Silver	Iron	Sodium
d. Iron	Silver	Sodium

22. Zoe put a strip of burning metal in a jar filled with carbon dioxide gas as shown in the diagram to check the reactivity of a metal.



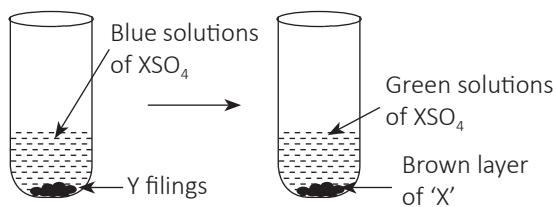
What will be the result of Zoe's experiment if the metal is more reactive than carbon?

- I. It will remain lit with a bright flame producing black fragments (carbon).
 - II. It will remain lit with a bright flame producing white powder.
 - III. No reaction will occur.
- Only I
 - Only II
 - Both I and II
 - None of these

23. Which of the following reactions will not take place easily?

- $K(s) + NaCl(aq) \rightarrow KCl(aq) + Na(s)$
- $Mg(s) + Pb(NO_3)_2(aq) \rightarrow Pb(s) + Mg(NO_3)_2(aq)$
- $Zn(s) + Cu(NO_3)_2(aq) \rightarrow Cu(s) + Zn(NO_3)_2(aq)$
- $2AgNO_3(aq) + Cu(s) \rightarrow 2Ag(s) + Cu(NO_3)_2(aq)$

24. Study the given figures.



What are X and Y, respectively?

- Zn and Ag
- Cu and Fe
- Fe and Cu
- Zn and Cu

25. Study the given table carefully and select the correct option.

Sample	Electrical Conductivity	Malleability
W	✓	✗
X	✗	✗
Y	✗	✓
Z	✓	✓

- a. W – Cu, X – S
b. X – S, Y – Coal
c. Y – Fe, Z – Cu
d. X – Coal, Z – Cu

Darken your choice with HB pencil -

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. a b c d
7. a b c d

8. a b c d
9. a b c d
10. a b c d
11. a b c d
12. a b c d
13. a b c d
14. a b c d

15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. a b c d

22. a b c d
23. a b c d
24. a b c d
25. a b c d

- ⇒ Robert Hooke observed the cork cells, which were dead cells. They appeared to him like small compartments so he called them 'cells'.
 - A cell is the smallest unit of life. All living things are made up of cells. Some organisms are made up of only one cell like - bacteria, paramecium and yeast.
 - All species of animals, land plants, few species of fungi and algae contain more than one cell and are called multicellular organisms.
 - Cells can be seen only under a microscope. It is an optical instrument used to see very tiny objects that we are unable to see with our naked eyes.
- ⇒ Plant cell – A plant cell has a nucleus, cytoplasm, a cell membrane and a cell wall. Some plant cells have chloroplast. Chloroplast contains chlorophyll which traps light energy needed for plants for the process of photosynthesis. Cell wall supports and gives the cell a regular shape.
- ⇒ Animal cell – An animal cell has a nucleus, cytoplasm, and a cell membrane. Nucleus controls all activities of the cell. It also stores genetic information. Cytoplasm is fluid that fills a cell. Cell membrane controls the movement of substances into and out of the cell

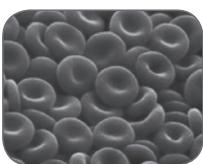
SECTION - A : SCIENTIFIC REASONING

1. Jiya observed a cell under a microscope. She saw a transparent jelly-like substance in the cell. What was that substance?

- a. Cytoplasm
- b. Nucleus
- c. Cell membrane
- d. Vacuole

2. The cell shown in the diagram is _____.

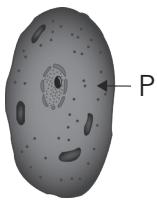
- a. WBC
- b. RBC
- c. Platelets
- d. None of these



3. Identify the organelle which is responsible for making proteins.

- a. Golgi complex
- b. Ribosome
- c. Chloroplast
- d. Cell membrane

4. Look at the diagram shown here. Which of the following best describes the area marked as P?



- a. It contains genes.
- b. Most of the cell processes take place here.
- c. It controls the substances entering and leaving the cell.
- d. It gives support to the cell.

5. Molly observed a cell under a microscope and concluded that it was a plant cell. Which of the following support her conclusion?

- a. The cell had a almost rectangular shape.
- b. The cell membrane was present.
- c. The cell had more cytoplasm.
- d. None of these

6. The given figure shows the component of blood. Which of the following is present in B but absent in A?

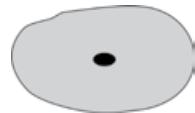


- a. Nucleus
- b. Antibody
- c. Both a. and b.
- d. Chloroplast

7. X is the part of a cell that carries information that controls the characteristics that are passed from one generation to the next generation. Identify X.

- a. Chloroplast
- b. Cell membrane
- c. Cytoplasm
- d. Nucleus

8. The given figure shows a unicellular organism known as amoeba. Why there is no need for an amoeba to have division of labour?

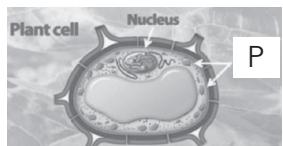


- I. It is in contact with the surroundings directly.
- II. It obtains nutrients and removes waste products between the cell and the surrounding.
- a. Only I
- b. Only II
- c. Both I and II
- d. None of these

9. Identify the correct match.

- I. Leucoplasts – The colourless plastids
- II. Chloroplasts – The green coloured plastids
- III. Chromoplasts – The coloured plastids
- IV. Protoplasts – These are not plastids
- a. I and II
- b. III and IV
- c. Both I and III
- d. All of these

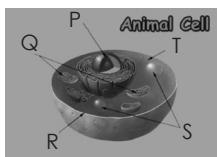
10. Which of the following is correct for the part labelled as P in the above diagram?



- a. It is the cytoplasm of the cell.
- b. It is called the suicidal bag of the cell.
- c. It is called the control centre of the cell.
- d. It is called the kitchen of the cell.

11. What is true for the animal cell shown in the diagram given here?

- a. Oxidation of food takes place in Q.
- b. The central information of the cell is S.
- c. R is the jelly in which organelle floats.
- d. P controls entry into and out of the cell.



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

- I. Cilia are present in Paramecium.
 - II. Flagella are present in Euglena.
 - III. Cilia help in the growth of the cell.
 - IV. Both cilia and flagella help in movement.
- a. Only IV
 - b. Only III
 - c. I, II and IV
 - d. I and II

13. Lysosomes are called suicide bag of the cell because

- I. These cause destruction of a cell through the action of its own enzymes.
 - II. Lysosomes engulf viruses and bacteria.
- a. Only I
 - b. Only II
 - c. Both I and II
 - d. None of these

14. The diagram shows four different cells as seen through a microscope.

Which of the following cell/cells has a nucleus?



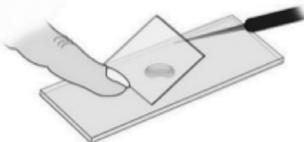
- a. I only
- b. II and III only
- c. II and IV only
- d. II, III and IV only

15. X and Y are two cells. X is a dead cell while Y is a living cell. Which of the following explains the correct difference between X and Y?

- a. There is a change in the specific organization of both X and Y.
- b. There is a change in the surrounding atmosphere of both X and Y.
- c. The vital processes of X are destroyed while the vital processes of Y are not destroyed.
- d. None of these

SECTION - B : EVERYDAY SCIENCE

16. The given diagram shows a small glass object placed on the material which is to be mounted. This is called _____ and it is placed very cautiously to _____.



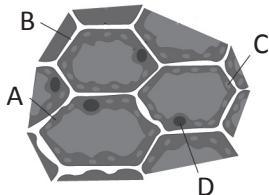
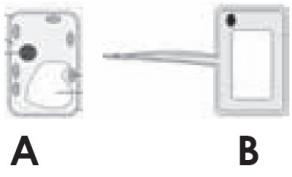
- a. Glass, avoid drying of the material
- b. Cover slip, avoid air bubbles
- c. Glass, increase visibility
- d. Glass slide, avoid folding of the material

17. What is the benefit of having division of labour in a multicellular living organism?

- a. It reduces the energy requirement in a multicellular living organism.
- b. It enables efficient functioning of the processes in a multicellular living organism.
- c. It reduces the waste products produced in a multicellular living organism.
- d. It enables the multicellular living organism to defend the bacteria better.

18. Jiya had a fall and had some bruises. Which of the following statements describes what will happen to the cells in her body?
- The cells which were knocked by the fall will double themselves.
 - The number of cells in the body will remain the same.
 - New cells will be produced to replace the damaged cells.
 - The cells in the body will not be affected by the fall.
19. Riya has prepared cheek cell mount and Tina has prepared onion cell mount. To distinguish microscopically between both the cell mounts, one should look for the presence or absence of:
- Nucleus
 - Plastid
 - Peroxisomes
 - Lysosomes
20. Nerve cells help our body to connect and communicate messages to our brain. Which of the following correctly explains the function of a nerve cell?
- It brings about movement in the body parts.
 - It carries message to and from the brain.
 - It gives protection to the underlying parts.
 - It transports oxygen to all the parts of the body.

SECTION - C : BRAINBOX

21. Study the plant cell shown here. Which of the following is correct match on the basis of the given figure?
- 
- The region where chromosomes can be found- D.
 - The part which gives the cell its rigid shape- B.
 - Controls the movement of substances in and out of a cell- A.
 - The region where light energy is converted into chemical energy- C.
22. Aman examined two plants cells under a microscope. One was taken from a leaf A and the other, from the root of the same plant B
- 
- Why both cells are shaped differently, despite the fact that both are plant cells?
- Because they have different functions.
 - Because they contain chlorophyll.
 - Because of the presence of chloroplast in these cells.
 - None of these
23. The table shows the properties of cells P, Q and R.
- | Cells | P | Q | R |
|---------------|---|---|---|
| Cytoplasm | ✓ | ✓ | ✓ |
| Cell membrane | ✓ | ✓ | ✓ |
| Nucleus | ✓ | ✓ | ✓ |
| Cell wall | ✓ | ✓ | |
| Chloroplasts | ✓ | | |
- On the basis of the above table, some students made the following conclusion about the cells.
- Cell P is a plant cell.
 - Cell Q is a plant cell.
 - Cell R is an animal cell.
 - We cannot determine if R is a plant cell or an animal cell from the information given.

Which of the above statements is/are correct?

- a. I only
 - b. II only
 - c. I, II and III
 - d. I, II and IV

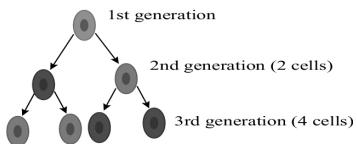
24. Study the description about an organism.

This is a single-cell organism that has both plant and animal characteristics. It has a very distinctive red eye spot and its single hair-like structure propels it forward.

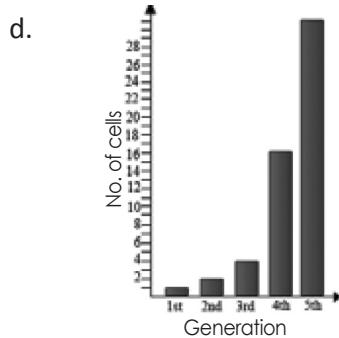
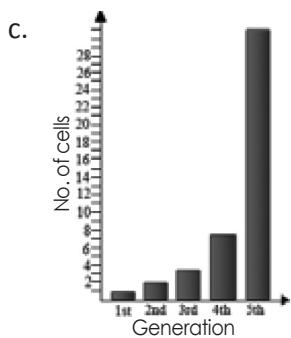
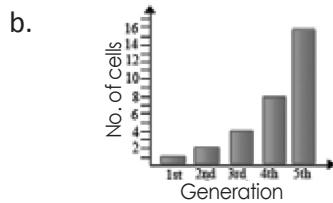
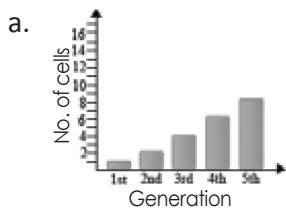
Tiya made sketches of four organisms. Which sketch fits the description given above?



25. Reproduction in unicellular organisms takes place by cell division as shown below.



Which of the following graphs best describes this cell division process?



Darken your choice with HB pencil

- | | | | |
|----------------|-----------------|-----------------|-----------------|
| 1. a b c d | 8. a b c d | 15. a b c d | 22. a b c d |
| 2. a b c d | 9. a b c d | 16. a b c d | 23. a b c d |
| 3. a b c d | 10. a b c d | 17. a b c d | 24. a b c d |
| 4. a b c d | 11. a b c d | 18. a b c d | 25. a b c d |
| 5. a b c d | 12. a b c d | 19. a b c d | |
| 6. a b c d | 13. a b c d | 20. a b c d | |
| 7. a b c d | 14. a b c d | 21. a b c d | |

Reproduction and Endocrine System

- Human beings become capable of reproduction after puberty sets in. The period of life when the body undergoes changes, leading to reproductive maturity is called adolescence.
- Between the age of 11 years and 19 years, children are called adolescents.
- The human body undergoes several changes during adolescence; these changes mark the onset of puberty. The onset of puberty brings about growth of reproductive organs, hair growth on various body parts, breast development in girls and moustache and beard growth in boys.
- Children gain height during the period of adolescence. The changes which occur during adolescence are controlled by hormones which are secreted by endocrine glands.
- The first menstrual flow in women begins at puberty and is termed as menarche. It stops at the age of 45 to 50 and stopping of menstruation is called menopause.
- Testosterone is the male hormone and estrogen is the female hormone
- Sex of the unborn child depends on whether the zygote has XX or XY chromosomes.
- It is important to eat balanced food and maintain personal hygiene during adolescence.
- Family planning is having to decide when to have a baby and how many children to have.
- Premature termination of pregnancy is called abortion. It can be either spontaneous or induced.

SECTION - A : SCIENTIFIC REASONING

1. The voice boxes in boys are:
 - a. Larger than the voice boxes in girls.
 - b. Smaller than the voice boxes in girls.
 - c. Equal in size to the voice boxes of girls.
 - d. Very big in size.
2. The brain of which of the following human beings have the greatest capacities for learning?
 - a. An infant
 - b. A boy of 5 years old
 - c. An old man of 78 years old
 - d. A girl of 14 years old
3. Which of the following is incorrectly matched?
 - a. Growth hormone- Helps in the growth of the body
 - b. Insulin- Maintains the amount of sugar in the blood
 - c. Testosterone- Causes secondary changes in boys
 - d. Estrogen- Causes primary changes in girls
4. HIV virus infection can be transmitted:
 - a. By sharing syringes by an infected person and a healthy person.
 - b. From an infected mother to an infant through her milk.
 - c. Through sexual contact with an infected person.
 - d. By all of these.
5. The contraceptive pills prevent conception by _____.
 - a. Destroying sperm in the vagina.
 - b. Preventing sperms from reaching the fallopian tube.
6. Preventing the maturation of ova.
Destroying the ova.
7. A correct statement regarding reproduction is that:
 - a. Ovaries produce female gametes.
 - b. Ovaries produce male gametes.
 - c. Female gametes are called sperms.
 - d. Male gametes are called ova.
8. The pituitary gland is often described as “The Leader of Endocrine Orchestra” because it:
 - a. Controls the activities of all the other endocrine organs in vertebrates.
 - b. Controls the activities of thyroid gland, gonads and adrenal cortex.
 - c. Controls growth in vertebrates.
 - d. Is responsible for gigantism.
9. Which of the following incorrectly represents the difference between internal and external fertilization?

Internal Fertilisation	External fertilization
It is the fusion of sperm and ovum inside the body of the female	It is the fusion of sperm and ovum outside the body of the female
It occurs in humans, hens, cows, etc.	It occurs in fish, frogs, etc.
It does not require presence of water	Presence of water is required for it
It requires presence of wind	It may or may not require presence of wind

9. Which of the following sequence of events is correct?
- Menstruation → ovulation → fertilisation → implantation
 - Implantation → ovulation → fertilisation → menstruation
 - Ovulation → menstruation → implantation → fertilisation
 - Implantation → ovulation → menstruation → fertilisation
10. Endocrine glands:
- Are ductless glands whose secretions pour directly into blood.
 - Have ducts which straightaway pour secretions into the target organs.
 - Have ducts and they pour their secretions into blood directly.
- I and II
 - II and III
 - Only I
 - Only II
11. Which of the following is correct about aldosterone?
- It acts mainly at the renal tubules.
 - It stimulates the reabsorption of Na^+ and water and excretion of K^+ and phosphate ions.
 - Aldosterone helps in the maintenance of electrolytes, body fluid volume, osmotic pressure and blood pressure.
 - All of these
12. Which of the following statements regarding zygote is correct?
- a. A zygote refers to the ball of cells formed from the fertilisation of an egg by a sperm cell.
- b. The chemical surface of a zygote is modified to refuse entry to further sperm cells once the nuclei of the gametes fuse.
- c. In single celled organisms, the zygote can divide asexually by mitosis.
- d. All of these
13. Riya tabulated the names of the glands and the hormones they secrete as given below. But she made a mistake. Find her mistake.
- | Gland's Name | Hormones |
|--------------|--------------|
| a. Thyroid | Thyroxine |
| b. Pancreas | Bila |
| c. Ovaries | Oestrogen |
| d. Testes | Testosterone |
14. Epinephrine, also called emergency hormone, is:
- An adrenal hormone
 - Glomerulus of mammalian kidney
 - Proximal part of nephron
 - Stomium of nephron
15. Which of the following statements is correct about melatonin?
- It lightens skin colour.
 - It increases urine flow.
 - It increases blood pressure.
 - It increases glucose level.

SECTION - B : EVERYDAY SCIENCE

16. Which of the following statements is/are true about acne and pimples?
- Acne and pimples develop due to the increased activity of the glands in the skin.
 - Acne develops on those areas of the skin where sebaceous glands are most numerous.
 - The face, scalp, neck, chest, back, upper arms and shoulders are the body parts where sebaceous glands are high in number.
- I and II
 - II and III
 - I, II and III
 - I and III

17. Which of the following correctly shows the difference between menarche and menopause?
- I. Menarche is the start of menstrual flow in the life of a female but menopause is the stoppage of menstrual flow in the female.
 - II. Menarche occurs at puberty but menopause occurs at 45-50 years of age.
 - III. Menarche marks the end of reproductive life of a women but menopause marks the beginning of reproductive life of a women.
- a. I and II b. II and III
 c. Both a and b d. Only II
18. Which of the following is incorrect about in vitro fertilisation?
- In vitro fertilisation is the process in which egg cells are fertilized by sperm outside the women's womb.
 - In vitro fertilisation is the major treatment in infertility, in case of blockage of oviduct in women.
19. Babies born through this technique are called as test-tube babies.
- c. Babies born through this technique are called as test-tube babies.
 d. None of them
19. Gorilla-like men with large head and hands and protruding jaws, are produced as a result of:
- An over secretion of growth hormone since the beginning of maturity.
 - An excess of vitamin C in the diet.
 - An over secretion of thyroxin.
 - Excess secretion of thyroid stimulating hormones.
20. Which of the following holds true for puberty?
- Puberty is the period of human development during which physical growth and sexual maturation occurs.
 - At puberty, an adolescent, while adjusting the changes in the body and mind may feel insecure.
- a. Only I b. Only II
 c. Both I and II d. None of them

SECTION - C : BRAINBOX

21. Which pathogen causes AIDS, Gonorrhoea and Syphilis?

	AIDS	Gonorrhoea	Syphilis
a.	Bacterium	Bacterium	Virus
b.	Bacterium	Virus	Virus
c.	Virus	Bacterium	Bacterium
d.	Virus	Virus	Bacterium

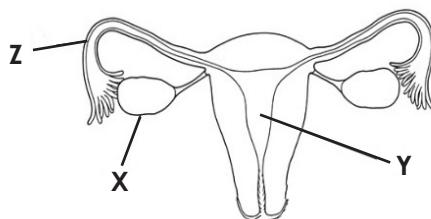
22. Following characteristics have been observed in a boy.

- Growth of testicles
- Growth of pubic hair
- Growth of hair in armpits
- The larynx become larger

These characters are _____.

- Primary sexual character
- Secondary sexual character
- Vegetative character
- Adult character

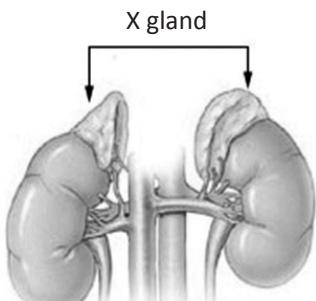
23. The diagram shown below shows parts of female reproductive system in humans.



Which is the site for fertilisation, implantation and ovulation?

	Fertilisation	Implantation	Ovulation
a.	X	Y	Z
b.	X	Z	Y
c.	Z	Y	X
d.	Y	X	Z

24. Which of the following is correct for the X gland shown in the given figure?



- I. It produces adrenaline.
 - II. It produces hormone that helps in regulating blood sugar.
 - III. It produces hormone that breaks down protein and fat
- a. I and II b. II and III
 c. Both a. and b. d. None of these

25. Which of the following statements correctly shows the role of luteinizing hormone (LH) and follicle stimulating hormone (FSH) in male and female?
- I. In males, LH stimulates the synthesis and secretion of hormones called androgens from testis.
 - II. FSH and androgens regulate spermatogenesis.
 - III. In females, LH induces ovulation of fully mature follicles (graafian follicles) and maintains the corpus luteum formed from the remains of the graafian follicles after ovulation.
 - IV. FSH stimulates growth and development of the ovarian follicles in females.

- a. I and II
 b. II and III
 c. I, II and III
 d. I, II, III and IV

Darken your choice with HB pencil -

1. a b c d
 2. a b c d
 3. a b c d
 4. a b c d
 5. a b c d
 6. a b c d
 7. a b c d

8. a b c d
 9. a b c d
 10. a b c d
 11. a b c d
 12. a b c d
 13. a b c d
 14. a b c d

15. a b c d
 16. a b c d
 17. a b c d
 18. a b c d
 19. a b c d
 20. a b c d
 21. a b c d

22. a b c d
 23. a b c d
 24. a b c d
 25. a b c d

Force, Pressure and Friction

⇒ A push or a pull on an object is called force. A force arises due to the interaction between two objects.

- Force has magnitude as well as direction.
- Force may change the state of motion of an object or it may bring about a change in the shape of an object.
- Forces can be categorised as contact forces and non-contact forces.
- Force per unit area is called pressure.
- The atmospheric air extends up to many kilometres above the surface of the earth. The pressure exerted by this air is known as atmospheric pressure.
- Weight of the body, $W = mg$ where, m is the mass of the body and g = acceleration due to gravity (value 9.8 ms^{-2}).
- Friction is the “evil” of all motion. No matter which direction something moves in, friction pulls it the other way.
- Friction is caused by the irregularities on the two surfaces in contact.
- Static friction comes into play when we try to move an object at rest.
- Sliding friction comes into play when an object is sliding over another.

SECTION - A : SCIENTIFIC REASONING

1. Upward push which acts on a body which is partially or totally immersed in a liquid or gas is called:
 - a. Upthrust
 - b. Gravity
 - c. Magnetic force
 - d. None of these
2. When a car takes turn around a curve road, the passengers feel a force acting on them in a direction away from the centre of the curve. It is due to?
 - a. Force of friction
 - b. Their inertia
 - c. Centripetal force
 - d. Both b and c
3. A force P accelerates an object from rest to a velocity v. Another force Q decelerates the same object from v to rest, then
 - a. Q is always equal to P.
 - b. Q is greater than P.
 - c. Q cannot be equal to P.
 - d. None of these
4. What happens, when a body undergoes acceleration?
 - a. Its velocity always increases.
 - b. Its acceleration always increases.
 - c. A force always acts on it.
 - d. Both a and c
5. Three forces start acting simultaneously on an object moving with a velocity v. These forces are represented in magnitude and direction by three sides of a triangle taken in the same order. The object will now move with a velocity
 - a. Same as v
 - b. Less than v
 - c. More than v
 - d. None of these
6. An object is moving in a straight line on a smooth surface at 6 m/s when a constant force acts on it from the opposite direction. If the force is held constant for a long time, how long will the object move?
 - a. It will decelerate, stop and then move in the opposite direction with a constant acceleration.
 - b. It will stop moving immediately when force is applied.
 - c. It will decelerate and then stop.
 - d. It will decelerate, stop and then move in the opposite direction with a constant speed.
7. When a bicycle is in motion, the force of friction exerted by the ground on the two wheels is such that it acts
 - a. In the backward direction on both the wheels.
 - b. In the forward direction on both the wheels.
 - c. In the backward direction on the front wheel and in the forward direction on the rear wheel.
 - d. None of these
8. Which of the following statements is/are correct about friction between the two bodies?
 - a. Limiting friction is always greater than the kinetic friction.
 - b. Static friction is always greater than the kinetic friction.
 - c. Limiting friction is never less than the static friction.
 - d. Both a and c

9. An athlete can take a longer jump if he comes running from a distance as compared to that when he jumps suddenly. Which type of inertia is correct for above?
- Inertia of rest
 - Inertia of direction
 - Inertia of motion
 - None of these
10. A car is going on a horizontal road towards east. The frictional force on the car by the road (Neglect any force by air) _____
- Is towards east, if the car is accelerating.
 - May be zero if the car is moving with a uniform velocity.
 - Must be towards east.
 - Both a and b
11. A desk and a book are resting on the ground. Which of the following changes when the book is put on the desk?
- The net force acting on the desk.
 - The gravitational force acting on the desk.
 - The reaction force from the ground acting on the desk.
 - None of these
12. A speedometer typically has a threshold of about 15 km/hr. If the car starts from rest and accelerates, the speedometer will
- a. Start reading from the moment the car starts.
- b. Start reading when the speed reaches 15 km/hr.
- c. Start reading when the speed reaches 20 km/hr.
- d. None of these
13. When two surfaces in contact have a very thin layer of lubricant between them, it is due to
- Solid friction
 - Rolling friction
 - Greasy friction
 - Film friction
14. Read the following statements and mark the correct option.
- Statement 1: Force of friction depends on the actual area of contact.
- Statement 2: Larger the area of contact, larger is the opposition to motion.
- Only 1 is correct
 - Only 2 is correct
 - Both are correct
 - Both are incorrect
15. The rate at which fluid flows through a closed pipe can be determined by –
- Determining the mass flow rate.
 - Determining the volume flow rate.
 - Either a or b
 - None of these

SECTION - B : EVERYDAY SCIENCE

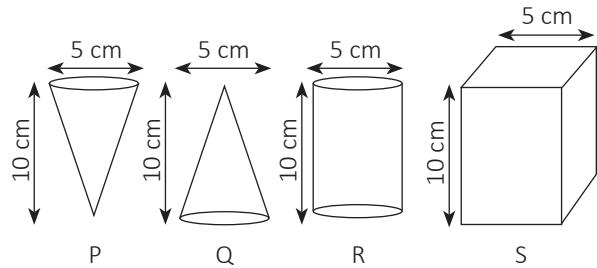
16. A man sharpens a knife on a stone. Which of the properties of friction helps him in doing this?
- Friction helps us to hold objects.
 - Friction produces heat energy.
 - Friction acts in opposite direction of motion.
- IV. Friction causes the surfaces in contact to wear away.
- Choose the correct option
- I & II
 - I, III & IV
 - III & IV
 - I, II, III, IV

17. When we walk on sand our feet sink into it and it is difficult for us to walk. But a camel easily walks on sand because –
- The weight of the camel is the force that is spread over the large area covered by its feet.
 - The mass of the camel is the force that is spread over the large area covered by its feet.
 - The pressure exerted by the camel's body on the sand is very large.
 - All are correct.
18. A sharp knife enables us to cut through things more easily as compared to a blunt knife because :
- The pressure exerted is lesser when the same force is used.
 - The pressure exerted is greater when the same force is used.
 - The sharp edge can pass through the materials slowly.
 - The sharp edge is not felt when cutting through the material.
19. Raman pushes a box across the floor. It comes to stop shortly after being pushed.
- Which one of the following reasons explains why did this happen?
- Gravity is acting on the box in the direction opposite to the box's movement.
 - Friction is acting on the box in the same direction as the box's movement.
 - Friction is acting on the box in the direction opposite to the box's movement.
 - The heat produced during the box's movement slows down the box.
20. For every action there is always an equal and opposite reaction. Which of the following statements is correct regarding this?
- The buggy pulls the horse backward just as hard as the horse pulls the buggy forward. Both of them would not move forward if surface is frictionless.
 - The horse pulls the buggy forward slightly harder than the buggy pulls the horse backward and so they move forward.
 - The horse can pull the buggy forward only if the horse weighs more than the buggy.
 - None of these

SECTION - C : BRAINBOX

21. A 4.0 kg block of wood is pulled along a horizontal ground from rest and a force of 15 N is required to produce an acceleration of 2.0 m/s^2 . In order to pull the block of wood at a constant speed of 5.0 ms^{-1} on the same horizontal ground, what should the magnitude of the force be?
- 5 N
 - 7 N
 - 8 N
 - 10 N
22. Forces P and Q act at a point O as shown in the diagram. The angle between their lines of action is fixed at angle θ , greater than 90° but lesser than 180° . If the magnitudes of P and Q can be varied, the line of action of their resultant can be made to lie _____.
-

- I. Between the direction of P and OY.
 II. Along the direction of OY.
 III. Between the direction of Q and OY.
- I and II are possible.
 - I and III are possible.
 - II and III are possible.
 - I, II and III are possible.
23. Observe the given geometrical figure.



All the objects, P, Q, R, S have same mass. If they are dropped from a certain height on the floor which one of the given objects will exert maximum pressure on the floor?

- P
- Q.
- R
- S

24. You are told that both a 3 N horizontal force and a 4 N horizontal force are acting on an object, but you are not told about their directions. Based on this information, what is the possible range of the magnitude F of the net force acting on the objects?
- $3 \leq F \leq 4$
 - $1 \leq F \leq 4$
 - $3 \leq F \leq 5$
 - $1 \leq F \leq 7$
25. When the applied force is doubled on an object and the object is still at rest, what will the friction?
- Friction becomes doubled.
 - Friction becomes halved.
 - Friction becomes quadrupled.
 - Friction becomes zero.

Darken your choice with HB pencil -

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|--|---|---|---|
| 1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 15. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 22. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
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| 4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 11. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 18. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 25. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 12. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 19. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |
| 6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 13. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 20. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |
| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |

- ⇒ Sound is the disturbance of a medium, either gas, liquid or solid. In general we perceive sound as a change in air pressure which creates waves, sound waves, that arrive at our ears.
- The to and fro or back and forth motion of an object is called vibration. Some instruments produce sound due to the vibration of membranes, some due to the vibration of strings, and some others produce sound due to the vibration of an air column.
 - The loudness of sound depends on its amplitude. The loudness of sound is proportional to the square of the amplitude. (A roar of a lion is louder than a woman's voice). The loudness of sound is measured in Decibel (db). If loudness exceeds 80 db, then the sound becomes physically painful.
 - Not all sounds produced by vibrating bodies are audible. The human ear can recognise the sounds of frequencies in the range of 20 Hz to 20,000 Hz. This range of frequency of sound is called audible sound. Some animals like dogs and snakes can hear sounds of frequencies greater than 20,000 Hz.
 - Infrasonic sounds – Sounds of frequencies less than 20 Hz are called infrasonic sounds.
 - Ultrasonic sounds – The sounds of frequencies greater than 20,000 Hz are called ultrasonic sounds.

SECTION - A : SCIENTIFIC REASONING

1. We can hear sound when a ball strikes the floor because:
 - a. The air particles from the floor flow into our ears.
 - b. The air particles from the floor vibrate and produce longitudinal waves which flow through the air into our ears.
 - c. The air particles from the floor vibrate and produce sound.
 - d. The wavelength of the sound wave is large enough to produce the sound.
 2. Which of the following is true?
 - a. Speed of sound is approximately 330 ms^{-1} .
 - b. Speed of sound in steel is approximately 1600 ms^{-1} .
 - c. Speed of sound in water is approximately 1498 ms^{-1} .
 - d. Speed of sound in oxygen is approximately 150 ms^{-1} .
 3. Which of the following frequencies can be heard by a normal human being?
 - i. 1 Hz
 - ii. 100 Hz
 - iii. 10000 Hz
 - a. i and ii only
 - b. ii and iii only
 - c. i and iii only
 - d. i, ii and iii only
 4. Which of the following are applications of ultrasound?
 - i. To scan the womb of pregnant lady.
 - ii. To break up kidney stones and gall stones.
 - iii. To detect flaws in metals.
 - a. i and ii only
 - b. ii and iii only
 - c. i and iii only
 - d. i, ii and iii only
 5. A girl sitting on a swing stands up. What will be the effect on the periodic time of the swing?
 - a. Increase
 - b. Decrease
 - c. Unchanged
 - d. First increase and then decrease
 6. A 1 m long pendulum makes 20 vibrations in 40 s . Its length is increased to 4 m . The time taken to make 30 vibrations is
 - a. 60 s
 - b. 90 s
 - c. 120 s
 - d. 160 s
 7. What is the order of wavelength of visible light and audible sound?
 - a. $6 \times 10^{-7} \text{ m}, 16.6 \times 10^{-3} \text{ m}$
 - b. $6 \times 10^{-6} \text{ m}, 16.6 \times 10^{-3} \text{ m}$
 - c. $5 \times 10^{-7} \text{ m}, 8.9 \times 10^{-3} \text{ m}$
 - d. None of these
 8. What happens when a wave travels through a medium?
 - a. Particles are transferred from one place to another.
 - b. Energy is transferred in a periodic manner.
 - c. Energy is transferred at a constant speed.
 - d. None of the above statements are applicable.
 9. Which of the following statements is true?
 - a. Both light and sound waves can travel in vacuum.
 - b. Both light and sound waves in air are transverse.
 - c. The sound waves in air are longitudinal, while the light waves are transverse.
 - d. Both light and sound waves in air are longitudinal.

10. The sounds produced by different instruments are different. The characteristic of sound which helps to differentiate between the sounds of different instruments is called:
- Pitch
 - Quality
 - Loudness
 - Tone
11. Which of the following are always true for sound waves?
- Sound waves are produced by vibration.
 - Sound waves are longitudinal waves.
 - Sound waves have an approximate speed of 300 ms^{-1} .
- i and ii
 - ii and iii
 - i and iii
 - i, ii and iii
12. A hammer strikes one end of a very long metal pipe. A detector at the other end detects two sounds at an interval of 2s. Given the speed of sound in air and that in metal is 300 ms^{-1} and 5100 ms^{-1} , respectively, what is the length of the metal pipe?
- 21 m
 - 638 m
 - 4800 m
 - 9600 m
13. On decreasing temperature, what happens to the frequency of sound produced by organpipe?
- Increases
 - Decreases
 - Remains same
 - Cannot be determined
14. An ultrasonic wave is sent from a ship towards the bottom of the sea. It is found that the time interval between the sending and receiving of the wave is 1.6 s. What is the depth of the sea, if the velocity of sound in the seawater is 1400 m/s ?
- 1120 m
 - 560 m
 - 1400 m
 - 112 m
15. A guitar string is made to vibrate. What would make the pitch of the note rise?
- A decrease in amplitude of vibration.
 - An increase in amplitude of vibration.
 - A decrease in frequency of vibration.
 - An increase in frequency of vibration.

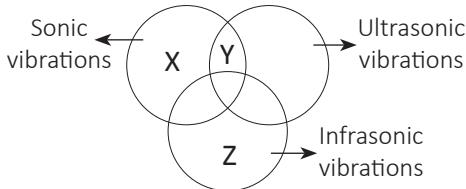
SECTION - B : EVERYDAY SCIENCE

16. A newly built classroom has problems with sound echoes. A number of suggestions were made to reduce the echoes occurring. Which one of the following would not help reduce the echoes?
- Carpet the room
 - Put heavy curtains on each window
 - Add more glass windows
 - Add a foam ceiling
17. Which of the following statements about ultrasound is/are correct?
- Ultrasound has the same frequency as the sound wave that we hear.
- ii. Sound wave that human beings cannot hear is known as ultrasound.
- iii. Ultrasound travels much faster than the sound wave that we hear.
- i only
 - ii and iii only
 - i and iii only
 - None of these
18. A trumpet and a flute are played by two students. The note from the trumpet is louder and has a lower pitch than the note from the flute. How do the amplitude and frequency of the sound from the trumpet compare to the amplitude and frequency of the sound from the flute.

	Trumpet's amplitude	Trumpet's frequency
a.	larger than that of flute	higher than that of flute
b.	larger than that of flute	lower than that of flute
c.	smaller than that of flute	higher than that of flute
d.	smaller than that of flute	lower than that of flute

19. Animals including humans can hear the sounds of different frequencies.

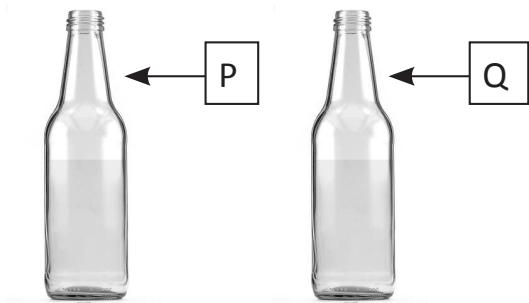
Study the given diagram.



Identify X, Y & Z animals

	X	Y	Z
a.	Human	Bat	Rhinoceros
b.	Bat	Rhinoceros	Human
c.	Rhinoceros	Human	Bat
d.	Dog	Human	Bat

20. A student took two bottles of glass and filled them with water as shown here.



Both the bottles are of the same size and shape. When he blows across the mouth of each bottle, what happens?

- a. The bottle P gives a note of higher pitch.
- b. The bottle P gives a note of higher pitch because of shorter air column.
- c. The bottle Q gives a note of higher pitch because of more air in the bottle.
- d. Both a. and b.

SECTION - C : BRAINBOX

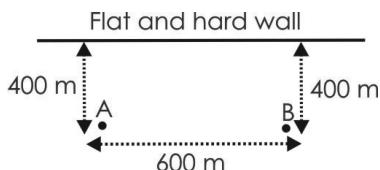
21. Which of the following statements is not possible?

- a. A man knocks at one end of long metal pipe and another man hears the knock at the other end.
- b. An explosion is heard by an astronaut when a laser beam hits an enemy fighter in space.
- c. A whale hears another whale in the deep sea.
- d. A mole hears another mole underground.

22. In an experiment to determine the speed of sound, a gun was fired and an observer at a distance measured the time interval between seeing the flash of the gun and hearing the shot. The speed of sound in air is calculated by the $\frac{\text{distance}}{\text{time}}$. Which of the following will affect the result?

- i. Wind blowing from the gunner to the observer.
 - ii. Wind blowing from the observer to the gunner.
 - iii. The loudness of the gunshot.
- a. i and ii
 - b. ii and iii
 - c. i and iii
 - d. i, ii and iii

23. Two men, A and B are facing a flat and hard wall as shown. When man A claps, man B hears two claps. If the speed of sound is 320 ms^{-1} , what is the time interval between the two claps heard by man B?



- a. 0.32 s b. 0.67 s
 c. 1.25 s d. 2.50 s
24. A microphone is connected to an oscilloscope. The diagram shows the trace on the screen when the microphone receives a pure note.



Which of the following trace can be obtained when a musical instrument produces a note of the same pitch but of a different quality?

- a. b.
 c. d.

25. A series of compressions and rarefactions of a sound wave is shown in figure. Given that the speed of sound is 300 ms^{-1} , what is the frequency of this sound wave?



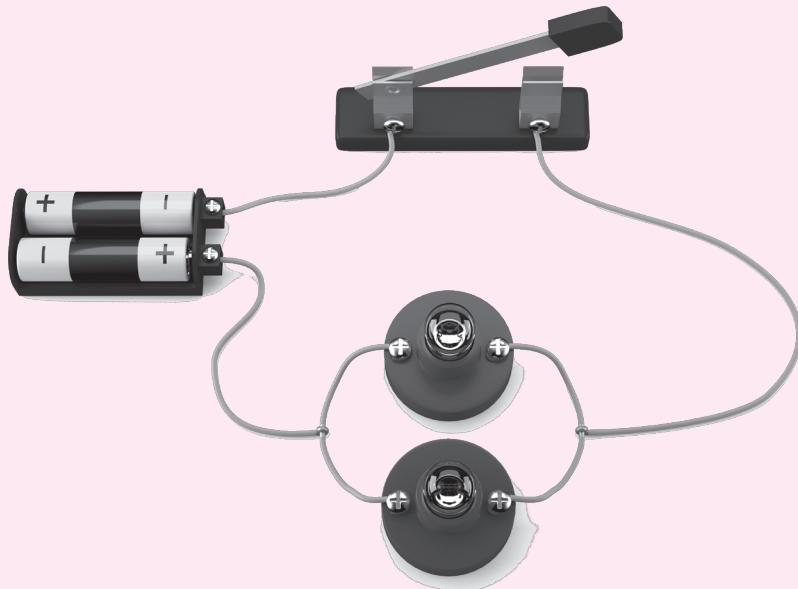
- a. 12.5 Hz
 b. 25.0 Hz
 c. 50.0 Hz
 d. 72.0 Hz

Darken your choice with HB pencil .

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| 2. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 9. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 16. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 23. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 3. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 10. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 17. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 24. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
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| 5. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | |
| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | |

Chemical Effects of Electricity and Natural Phenomenon

- Materials which allow electric current to pass through them are good conductors of electricity and which do not allow electric current to pass through them are insulators or bad conductors of electricity.
- Some liquids are good conductor of electricity and some are bad conductors of electricity.
- Most liquids that conduct electricity are solutions of acid, base and salt.
- The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.
- The passage of an electric current through a conducting liquid causes chemical reactions. The resulting effects are called chemical effects of current.
- Electric current produces magnetic effect.



SECTION - A : SCIENTIFIC REASONING

1. When we rub glass rod with fur, the glass rod will acquire –
 - a. Positive charge
 - b. Negative charge
 - c. No charge
 - d. Both a and b
2. Read the list of terms given below –
 - I. Tsunami
 - II. Landslides
 - III. Floods
 - IV. LightningWhich of them are caused due to Earthquake?
 - a. I & II
 - b. I, II & III
 - c. II, III & IV
 - d. II & III
3. What is the use of electroscope?
 - a. To detect and test small electric charges.
 - b. To calculate the amount of electric charge flowing through the conductor in the given interval of time.
 - c. To find out the presence of anti matter.
 - d. To test the presence of magnetic field.
4. The process of electrolysis is used for the obtaining metals which are
 - a. Highly unreactive
 - b. Highly reactive
 - c. Moderately reactive
 - d. All of these
5. During electroplating, the electrolyte is made of
 - a. Solution of metal salt on which plating is done
 - b. Metal salt solution of the metal to be electroplated
6. Solid X is deposited on the cathode when a current is passing through an aqueous electrolyte containing X via graphite electrodes. Choose the incorrect statement about X.
 - a. X forms cation.
 - b. X is a non-metal.
 - c. Ions of X are reduced at the cathode.
 - d. All of these
7. What is the resistance of a conductor?
 - a. When there are more atoms and molecules in conductor than free electrons, so as to restrict movement of electrons on getting current.
 - b. When conductor has equal amount of free electrons and atoms and molecules.
 - c. When there are more free electrons than molecules and there is no restriction in movement of electrons on passing current.
 - d. None of these
8. Which property of the electricity is responsible for use of fuse wire in household wiring?
 - a. Heating effect
 - b. Magnetic effect
 - c. Chemical effect
 - d. All of these
9. Electromotive force may be defined as the
 - a. Work done per coulomb on the charges
 - b. The number of coulombs of charge per second.
 - c. Drift velocity of electron
 - d. Flow of electron

10. When temperature rises, the drift velocity of the free electrons decreases. Hence for given applied voltage
- The electric current decreases, which increases the electrical resistance.
 - The electric current increases, which increases the electrical resistance.
 - Only electric resistance decrease and current remain same.
 - None of these
11. A uniform resistance wire of length L and diameter d has a resistance R. For another wire of the same material with length $4L$ and diameter $2d$, the resistance will be
- $4R$
 - $6R$
 - $2R$
 - R
12. The resistivity of a copper wire
- Decreases with increase in its cross section.
 - Increases with increase in its length.
 - Increases with increase in its temperature.
 - Increases with increase in its cross-section.
13. Why is mica sheets used in an iron instrument?
- Mica is a bad conductor of electricity and heat.
 - Mica is a good conductor of electricity.
 - Mica is a bad conductor of electricity but good conductor of heat.
 - Mica is a very light and bad conductor of electricity.
14. A voltmeter is used to find the potential difference in any electrical circuit. Which of the statements given below is true?
- A voltmeter is a high resistance instrument and is connected in parallel circuit.
 - A voltmeter is a high resistance instrument and is connected in series circuit.
 - A voltmeter is a low resistance instrument and is connected in series circuit.
 - None of these
15. During electrolytic refining of copper, H_2SO_4 acid is added to aqueous $CuSO_4$ to
- Increase conducting
 - Decrease conducting
 - Increase melting point
 - Decrease melting point

SECTION - B : EVERYDAY SCIENCE

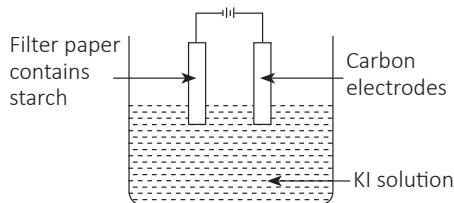
16. Our houses have an electricity meter, so that the cost of the electricity used by the household equipment can be calculated. What does the electricity meter record?
- Charge
 - Current
 - Energy
 - Power
17. The bumpers and the door handles of motor cars, taps, etc. are coated with chromium layer because :
- It does not easily get corroded.
 - It forms a hard layer which does not easily get scratched.
 - It is cheap.
 - All of these
18. Which of the following is the best safety measure during heavy lightning?
- Lying on the ground in an open area.
 - Standing under a tall tree.

- c. Staying indoors, away from metallic doors or windows.
d. Going into the nearest water body.
19. Which of the following could happen, if air and cloud were good conductors of electricity?
- A lightning could occur with high intensity.
 - A lightning could occur with low intensity
- c. A lightning could not occur at all.
d. A lightning with thunder could occur.
20. Tin cans are the tin electroplated on iron. These tin cans are used to preserve food items. Why are iron cans not used without tin coating?
- Tin is more reactive than iron.
 - Tin is less reactive than iron.
 - Tin is cheaper than iron.
 - Tin is lighter than iron.

SECTION - C : BRAINBOX

21. An electric kettle is plugged in and switched on. The fuse in the plug blows immediately. Which one of the following fault could cause this?
- The earth wire is not connected to the kettle.
 - The live wire and neutral wire connections in the plug are swapped around.
 - The live wire touches the metal case of the kettle.
 - The wires connected to the plug are too thin.

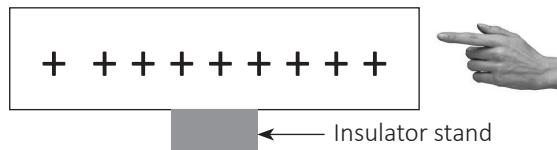
22. Study the given diagram,



When we write on wet filter paper, the colour of the paper changes to blue-black. Why does this happen?

- Iodine is formed at anode.
- Iodine turns blue black in presence of starch.
- Iodine is formed at cathode that causes change in colour.
- Both a. and b.

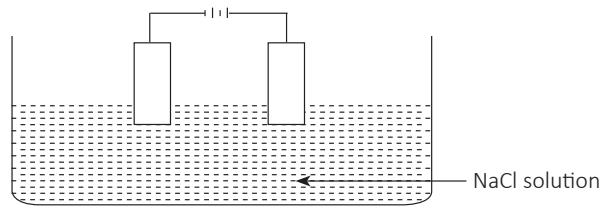
23. A uniform positively charged insulator was held by an insulator stand. A hand touched the charged insulator on one side for a few seconds as shown in the diagram



What would be the final charge on the insulator?

	Final charge on insulator	Reason
a.	Positive	The hand neutralised the part of the insulator it touched
b.	Positive	There were more positive charged ions in the insulator
c.	Neutral	The electrons neutralised the charged insulator when they touch it
d.	Negative	Excessive electrons will flow from the earth when the hand touches it

24. Study the given diagram.



What would happen when an electric current is passed through aqueous solution of NaCl?

- I. Electrolysis of NaCl will take place.
 - II. H₂ gas is produced at cathode and Cl₂ gas at anode.
 - III. H₂ gas is produced at anode and Cl₂ gas at cathode.
 - IV. NaOH gas is produced at anode and Cl₂ gas at cathode.
 - a. I & II
 - b. II & IV
 - c. I & IV
 - d. III & I

25. 'P' and 'Q' are lamps with filaments made of the same material.

The filament of lamp 'P' is thicker and shorter than that of lamp 'Q'. If each lamp is connected to the mains and switched on, which lamp will glow brighter and which has larger resistance?

Brighter Lamp	Larger Resistance
P	P
P	Q
Q	P
Q	Q

Darken your choice with HB pencil

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| 2. | <input checked="" type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 9. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 16. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 23. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 3. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 10. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 17. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 24. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
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| 5. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | | |
| 6. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | | |
| 7. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. | <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | | | | | |

- ⇒ Light is all around us. One of the properties of light is that it reflects off surfaces. Among other things, this reflection allows us to see images in mirrors
- A plane mirror is simply a mirror with a flat surface. All of us use plane mirrors every day, and so we have got plenty of experience with them. Images produced by plane mirrors have a number of properties, like:
 - i. The image produced is upright.
 - ii. The image is of the same size as the object.
 - iii. The image is at the same distance from the mirror as the object appears to be (i.e., the image distance = the object distance).
 - The **Universe** is all of time and space and its contents. It includes planets, moons, *minor planets*, stars, *galaxies*, the contents of *intergalactic space* and all matter and energy. The observable universe is about 28 *billion parsecs* (91 billion *light-years*) in diameter. The size of the entire Universe is unknown, but there are many hypothesis about the composition and evolution of the Universe

SECTION - A : SCIENTIFIC REASONING

1. Most stars are composed of
 - a. About 1/4 hydrogen and 3/4 helium
 - b. Mostly iron in their core
 - c. About 3/4 hydrogen and 1/4 helium
 - d. Equal parts hydrogen and helium
2. How does a lens work?
 - a. It forms an image by dispersing light.
 - b. It forms an image by refracting light.
 - c. It forms an image by reflecting light.
 - d. It breaks a spectrum into many colours.
3. The weight of an object in a satellite orbiting around the earth is
 - a. Actual weight.
 - b. Zero.
 - c. Greater than the actual weight.
 - d. Less than the actual weight.
4. As you move an object away from a convex mirror, its image becomes _____ and moves towards _____
 - a. Smaller, infinity
 - b. Smaller, focus
 - c. Enlarged, infinity
 - d. Enlarged, focus
5. Which of the following represents the outer planets?
 - a. Planets between the sun and the earth
 - b. Planets between the sun and the belt of asteroids
 - c. Planets in gaseous state
 - d. Planets without satellites
6. When light is passed through two consecutive mirrors, the resultant will be
 - a. Rainbow colours
 - b. White beam
 - c. No light
 - d. Dispersed light
7. Which of the following is not the effect of refraction?
 - a. Chopsticks appear to be bent in clear soup.
 - b. A fish appears to be larger in water.
 - c. Light travelling through optical fibre.
 - d. A man appears to be smaller from the point of view of a fish.
8. Compared to its neighboring planets, Mercury, Venus, and Mars, the surface of the Earth is relatively young. This youthful appearance results from
 - a. Tectonic activity still shaping the surface of the Earth
 - b. The Earth is furthest from the Sun
 - c. The fact that few major impacts ever occur on the Earth
 - d. The Earth having the largest Moon among all of these planets
9. Read the following statements and mark the correct option.
 - I. Jupiter is the largest of all the planets.
 - II. Jupiter's mass is more than the combined mass of all other planets.
 - III. Ganymede is the satellite of Jupiter.
 - a. I only
 - b. II and III only
 - c. I and III only
 - d. All of these
10. A light ray travels from a medium of refractive index 1.4 to another medium of refractive index 2.2. At what angle will total internal reflection occur?
 - a. 39.5°
 - b. 41.8°
 - c. 53.1°
 - d. Critical angle cannot be reached

11. Which of the following are true?
- An incident ray parallel to the principal axis after emerging from the converging lens will always pass through the focal point F of the lens.
 - An incident ray that passes through the focal point of a converging lens will travel in parallel to the principal axis after emerging from the converging lens.
 - A ray that passes through the optical centre of a thin converging lens will not be refracted by the lens and will continue to travel along its original path.
- a. 1 and 2 only b. 2 and 3 only
c. 1 and 3 only d. 1, 2 and 3
12. Which of the following effects is/are correct when using a thin converging lens instead of a thick converging lens?
- The image formed will be brighter.
 - The focal length will be longer.
 - The image formed will always be virtual.
- a. Only 1 b. Only 2
c. Only 3 d. All 1, 2 and 3
13. Which one of the following statements is not correct?
- Violet light is dispersed most when light passes through a triangular prism.
- b. Dispersion demonstrates that white light can be broken up.
c. Dispersion can easily be demonstrated using a convex lens.
d. A spectrum is formed when white light is dispersed.
14. If the image formed by a concave mirror is virtual, erect and magnified, then the object is placed _____.
- Between the pole of the mirror and the focus.
 - Beyond the centre of curvature.
 - At the centre of curvature.
 - None of these
25. Read the following statements and mark the correct option.
- Comets are very small-sized celestial bodies that revolve around the sun in highly elliptical orbits.
 - Comets are believed to have seeded earth with life.
 - Recently, the European Space Agency mission Rosetta landed on the comet 67P.
- a. I only b. II and III only
c. II only d. All of these

SECTION - B : EVERYDAY SCIENCE

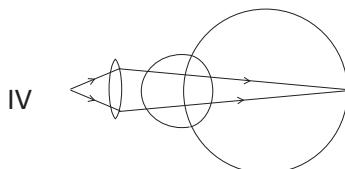
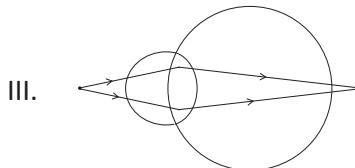
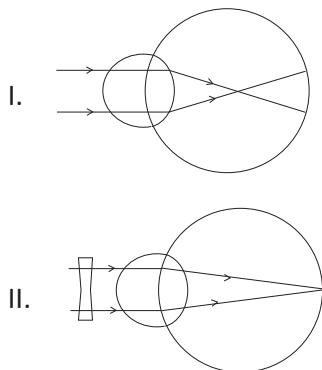
16. A cricket match was scheduled to be played at night. Team 'A' was wearing jersey with blue and white stripes. If the floodlights were producing yellow light, what colour would the stripes appear?
- Black and yellow
 - Blue and yellow
 - Blue and white
 - Black and white
17. The human eye has a converging lens system that produces an image at the back of the eye. If the eye views a distant object, which type of image is produced?
- Real, erect, same size
 - Real, inverted, diminished
 - Virtual, erect, diminished
 - Virtual, inverted, magnified

18. Read the information given below.

Planet	Earth	Jupiter	Neptune	Saturn
Value of 'g' (m/s^2)	10	20	14	12

According to this table, on which planet would a ball fall the fastest, if it is thrown upward?

- a. Jupiter
 - b. Saturn
 - c. Neptune
 - d. Earth
19. Anant is suffering from far sightedness. Which of the following diagrams show the disease and its correction by using a suitable lens, respectively?



Choose the correct option.

- a. I & II
- b. II & III
- c. III & IV
- d. I & IV

20. Arnav is suffering from colour blindness. Colour blindness is a hereditary defect. Which one of the following statements describes the reason for colour blindness?
- a. Number of cones are less than that of rods.
 - b. Number of cones are more than that of rods.
 - c. Number of cones are equal to that of rods.
 - d. Due to weaker crystalline muscles.

SECTION - C : BRAINBOX

21. A man standing in front of a special mirror finds his image having a very small face, a fat body and legs of normal size. Then he concluded that the special mirror was a combination of different types of mirrors with its top, middle and bottom parts made of:

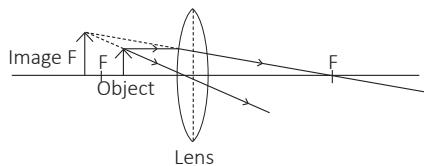
- a. Convex, plane and concave mirrors, respectively
- b. Plane, convex and concave mirrors, respectively
- c. Concave, convex and plane mirrors, respectively

- d. Convex, concave and plane mirrors, respectively

22. What is the effect on the image when the object is shifted closer to the thin diverging lens?

- | Position of image | Size of image |
|-------------------------------|---------------|
| a. Closer to the lens | gets bigger |
| b. Closer to the lens | gets smaller |
| c. Further away from the lens | gets bigger |
| d. Further away from the lens | gets smaller |

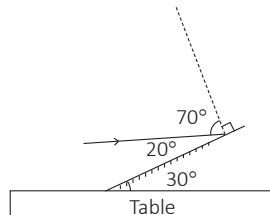
23. Study the given diagram. It shows a converging lens producing an upright, virtual image.



Which optical instrument uses this arrangement?

- a. A camera
- b. A magnifying glass
- c. A projector
- d. A photographic enlarger

24. A mirror is tilted at an angle of 30° to the table. A ray of light is directed so that it hits the mirror at an angle of 20° to the surface of the mirror.



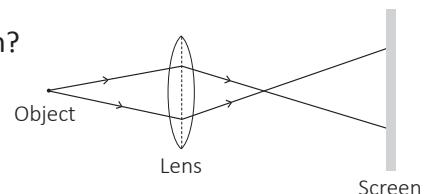
What would be angle of reflection?

- a. 20°
- b. 30°
- c. 50°
- d. 70°

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

How can a sharp image be obtained at focus on the screen?

- a. By moving the object away from the lens and screen.
- b. By moving the screen away from the lens and object.
- c. By using a brighter object at the same position.
- d. By using a lens of longer focal length at the same position.



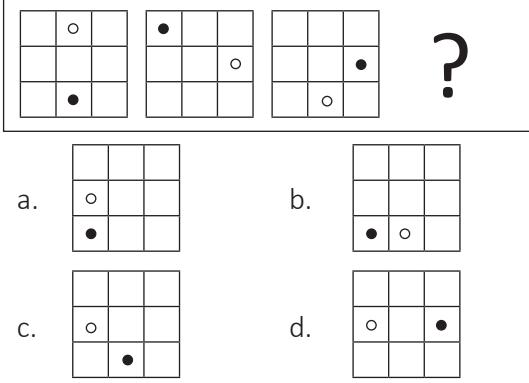
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| 2. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 9. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 16. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 23. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 3. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 10. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 17. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 24. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 11. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 18. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 25. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 12. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 19. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |
| 6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 13. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 20. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |
| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | |

**Chapter
13**

Logical Reasoning

Direction – Study the given series and replace the question mark (Q. No. 1 to 4).

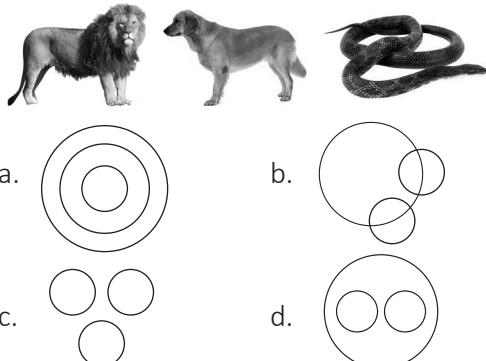
1. 0, 6, 24, 60, 120, 200, ?
 a. 242 b. 290
 c. 302 d. 336
2. Y, W, U, S, Q, ?, ?
 a. N, J b. O, M
 c. J, R d. M, L
3. 
4.

5	11	6
32	?	44
6	9	7

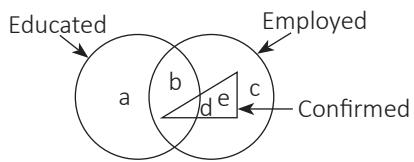
 a. 72 b. 92
 c. 101 d. 111
5. Which of the following indicates similar relationship as 'LOWER' has with 'WORLE'?
 a. WORDS : ROSWD
 b. GUAZE : AGEUZ
 c. AMONG : OMNAG
 d. ENTRY : RNYET
6. In a certain language, HEALTH is written as GSKIDG. Then how will NORTH be written in that code?
 a. GQSMN b. PRMFL
 c. IUSPQ d. GSQNM
7. If 'ROSE' is called 'POPPY', 'POPPY' is called 'LILY', 'LILY' is called 'LOTUS' and 'LOTUS' is called 'ANEMINE', which among the following is the king of flowers?
 a. Rose b. Lotus
 c. Anemone d. Poppy
8. Rahul said to the lady sitting in a car, "The only daughter of the mother of my wife is the sister-in-law of the brother of your sister". How is the husband of the lady related to Rahul?
 a. Father b. Son-in-law
 c. Brother-in-law d. Maternal Uncle
9. A is the mother of D and sister of B. C, the daughter of B, is married to F. G is the husband of A. How is G related to D?
 a. Husband b. Uncle
 c. Son d. Father
10. If Q is the South-West of P, R is to the East of Q and also South-East of P. S is to the North of R, in a line with QP. In which direction of P, S is located?
 a. East b. North
 c. South-East d. North-East

11. A, B and C are the three villages on a map. A is North of b and $\angle ABC$ is 45° in a clockwise direction. In which direction is C from B?
- North-East
 - North-West
 - South-East
 - South-West

12. Which among the following diagrams indicates the best relation amongst?



13. Study the given Venn diagram. Find the region presenting persons who are educated and employed but not confirmed in a job?



14. In search of Jadoo, Krishh walked 25 m towards South. Then he turned to his left and walked 20 m. He then turned to his left and walked 25 m. Again he turned to his right walked 15 m and finally he got Jadoo. At what distance and direction is he from the starting point?
- 35 m, North
 - 30 m, East
 - 30 m, North
 - 35 m, East

15. Arrange the given words in a meaningful sequence

P – Nation q – village r – city
s – district t – state

Choose the correct option

- | | |
|------------------|------------------|
| a. p, r, q, s, t | b. q, r, s, p, t |
| c. s, t, p, q, r | d. q, r, s, t, p |

16. Which of the following word will come in the last place if all of them are arranged alphabetically as in a dictionary?

- Research
- Rural
- Rational
- Rubric

17. If 'when' stands for 'x', 'you' stands for ' \div ', 'come' stands for '-' and 'will' stands for '+'. then what will be the value of

$$5 \text{ when } 10 \text{ will } 15 \text{ you } 3 \text{ come } 12$$

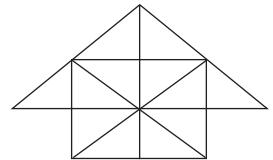
- 40
- 43
- 45
- 45.5

18. If 't' is called 'x', '-' is called ' \div ', 'x' is called ' $-$ ' and ' \div ' is called '+', then what will be the value of –

$$16 \div 64 - 8 \times 4 + 2 ?$$

- 12
- 16
- 18
- 24

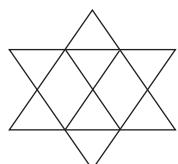
19. Count the number of triangles and squares in the given figure.



- 26 triangles, 6 squares
- 26 triangles, 5 squares
- 28 triangles, 6 squares
- 28 triangles, 5 squares

20. Count the number of parallelograms in the given figure

- 9
- 10
- 13
- 15



Direction – Choose the correct mirror image of numbers / letters / figures (Q. No. 21 – 23)

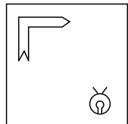
21. CURRICULUM /

- a. CURRICULUM
- b. CURRICULM
- c. CURRIUCULM
- d. MUERICULUM

22. 543189 / 68931452

- a. 541896
- b. 243189
- c. 689345
- d. 987345

23.



- a.
- b.
- c.
- d.

Direction – Find the water image of given letters / numbers / figures (Q. No. 24 – 26)

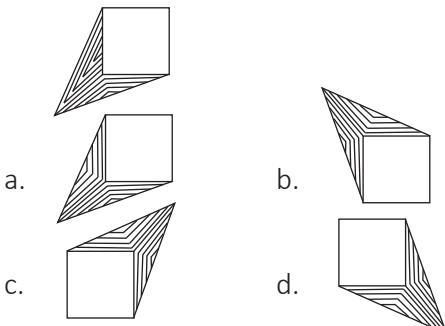
24. SUNDAY

- a. YANDNU
- b. YANDNU
- c. SUNDAY
- d. YANDNU

25. 99714568

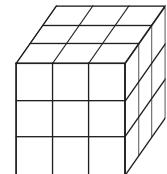
- a. 667147288
- b. 88714568
- c. 66745798
- d. 8874798

26.



27. Count the number of cubes in the given figure

- a. 64
- b. 20
- c. 25
- d. 27



28. In the following number series, how many 9s are immediately preceded by 3 and followed by 6?

39 69 39 39 63 63 39 56 95 69 39 63 9

- a. 1
- b. 2
- c. 3
- d. 4

29. Find the letter which is 2nd to the right of the letter which is 5th to the right of M.

- a. P
- b. O
- c. S
- d. T

30. Find the odd one out?

- a. 7D3
- b. 9B7
- c. 8D4
- d. 8F3

31. A, B, C, D and E are five friends standing in a park. The distance between A and C, and that of B and C is same. E and C are 45 m apart in west-east direction. A is towards west of C at a distance of 25 m from E. C is in between B and D and in north direction with respect to B. If the distance between B and D is 35 m, what is the distance between A and D?

- a. 15 m
- b. 20 m
- c. 25 m
- d. 30 m

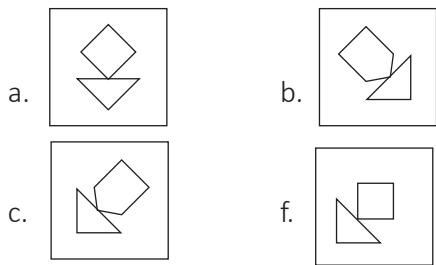
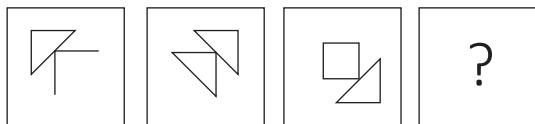
32. Read the given information to answer the question

"The pacific yew is an evergreen tree that grows in the Pacific North-West. The Pacific yew has a fleshy, poisonous fruit. Recently, taxol, a substance found in the bark of Pacific yew, was discovered to be a promising new anticancer drug."

Based on the given information, choose the correct statement.

- a. Taxol is poisonous when taken by healthy people.
- b. Taxol has cured people from various diseases.
- c. People should not eat the fruit of Pacific yew.
- d. The Pacific yew was considered worthless until taxol was discovered.

33. Find the figure which comes next in the given series.



34. Stone : Sculpture :: _____ : _____

- a. Mural : Painting
- b. Opera : Stage
- c. Canvas : Easel
- d. Clay : Pottery

35. In a certain language, SHIFT is written as RFFBO. Which word would be coded as LKUMB?

- a. MMXQG
- b. MMYZQ
- c. MLVNC
- d. KJTLA

36. P, Q, R and S were playing a game of cards. P said to Q, "if I give you Q cards, you will have as many as R has and I shall have 3 less than what R has. Also if I take Q cards from C, I shall have twice as many as D has."

If Q and S together have 50 cards, how many cards has P got?

- a. 35
- b. 40
- c. 42
- d. 45

37. Two bus tickets from city X to Y and 3 tickets from city X to Z cost Rs. 77 but 3 tickets from city X to Y and 2 tickets from city X to Z cost Rs. 73. What are the fares for cities Y and Z from X, respectively?

- a. Rs. 14, Rs 23
- b. Rs. 15, Rs 17
- c. Rs. 13, Rs 17
- d. Rs. 17, Rs 13

38. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. What is the sum amount?

- a. 650
- b. 690
- c. 698
- d. 720

39. By selling 45 oranges for Rs. 40, a man loses 20%. How many should he sell for Rs. 24 to gain 20% in the transaction?
- a. 15
 - b. 18
 - c. 20
 - d. 25

40. There were ten people in a meeting. At the end of the meeting, all of them shook hands with each other once. How many handshakes were there, together?
- a. 25
 - b. 35
 - c. 45
 - d. 90

Darken your choice with HB pencil

- | | | | |
|---|---|---|---|
| 1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 11. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 31. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 2. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 12. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 22. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 32. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 3. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 13. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 23. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 33. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 24. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 34. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 15. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 25. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 35. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 16. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 26. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 36. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 17. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 27. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 37. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 18. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 28. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 38. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 9. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 19. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 29. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 39. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 10. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 20. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 30. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 40. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |

Answers

Chapter 1: Crop Production and Management

1.	a	2.	a	3.	c	4.	d	5.	c	6.	d	7.	c	8.	d	9.	d	10.	a
11.	c	12.	b	13.	d	14.	c	15.	b	16.	a	17.	a	18.	c	19.	b	20.	b
21.	d	22.	c	23.	c	24.	c	25.	c										

Chapter 2: Microorganisms : Friends and Foes

1.	c	2.	a	3.	d	4.	b	5.	d	6.	a	7.	b	8.	b	9.	a	10.	d
11.	c	12.	d	13.	d	14.	b	15.	d	16.	d	17.	c	18.	d	19.	a	20.	c
21.	c	22.	a	23.	c	24.	c	25.	a										

Chapter 3: Synthetic Fibres and Plastics

1.	b	2.	d	3.	b	4.	b	5.	a	6.	b	7.	c	8.	b	9.	c	10.	a
11.	c	12.	d	13.	b	14.	b	15.	c	16.	c	17.	d	18.	b	19.	d	20.	b
21.	b	22.	b	23.	c	24.	b	25.	b										

Chapter 4: Coal and Petroleum

1.	b	2.	b	3.	d	4.	c	5.	a	6.	d	7.	d	8.	d	9.	d	10.	c
11.	b	12.	b	13.	c	14.	d	15.	d	16.	d	17.	a	18.	c	19.	a	20.	d
21.	a	22.	d	23.	b	24.	c	25.	a										

Chapter 5: Combustion and Flame

1.	d	2.	b	3.	c	4.	a	5.	d	6.	b	7.	a	8.	d	9.	b	10.	d
11.	a	12.	a	13.	b	14.	a	15.	a	16.	b	17.	c	18.	a	19.	d	20.	b
21.	b	22.	a	23.	b	24.	b	25.	d										

Chapter 6: Metal and Non-metal

1.	c	2.	a	3.	a	4.	b	5.	b	6.	a	7.	d	8.	a	9.	b	10.	d
11.	a	12.	a	13.	b	14.	a	15.	d	16.	c	17.	c	18.	b	19.	d	20.	c
21.	a	22.	c	23.	b	24.	b	25.	d										

Chapter 7: The Cell

1.	a	2.	b	3.	b	4.	b	5.	a	6.	c	7.	d	8.	b	9.	d	10.	d
11.	c	12.	c	13.	a	14.	d	15.	c	16.	b	17.	b	18.	c	19.	b	20.	b
21.	a	22.	a	23.	c	24.	d	25.	b										

Chapter 8: Reproduction and Endocrine System

1.	a	2.	d	3.	d	4.	d	5.	c	6.	a	7.	a	8.	d	9.	a	10.	c
11.	d	12.	d	13.	b	14.	a	15.	a	16.	c	17.	c	18.	d	19.	a	20.	c
21.	c	22.	b	23.	c	24.	c	25.	d										

Chapter 9: Force, Pressure and Friction

1.	a	2.	b	3.	d	4.	c	5.	a	6.	a	7.	c	8.	d	9.	c	10.	d
11.	c	12.	b	13.	d	14.	d	15.	c	16.	c	17.	a	18.	b	19.	c	20.	a
21.	b	22.	d	23.	a	24.	d	25.	a										

Chapter 10: Sound

1.	b	2.	c	3.	b	4.	d	5.	b	6.	c	7.	a	8.	a	9.	c	10.	b
11.	a	12.	b	13.	b	14.	a	15.	d	16.	d	17.	d	18.	b	19.	a	20.	b
21.	b	22.	d	23.	c	24.	b	25.	b										

Chapter 11: Chemical Effects of Electricity and Natural Phenomenon

1.	a	2.	b	3.	a	4.	b	5.	a	6.	b	7.	a	8.	a	9.	a	10.	a
11.	d	12.	c	13.	a	14.	a	15.	a	16.	c	17.	d	18.	c	19.	c	20.	b
21.	c	22.	d	23.	b	24.	b	25.	c										

Chapter 12: Light and Our Universe

1.	c	2.	b	3.	b	4.	b	5.	c	6.	b	7.	c	8.	a	9.	d	10.	d
11.	d	12.	b	13.	c	14.	a	15.	d	16.	a	17.	b	18.	a	19.	c	20.	a
21.	d	22.	a	23.	b	24.	a	25.	d										

Chapter 13: Logical Reasoning

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

My Notes

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