

ಕರ್ನಾಟಕ  ಸರ್ಕಾರ

ಶಾಲಾ ಶಿಕ್ಷಣ ಮತ್ತು ಸಾಕ್ಷರತಾ ಇಲಾಖೆ

ಜಿಲ್ಲಾ ಶಿಕ್ಷಣ ಮತ್ತು ತರಬೇತಿ ಸಂಸ್ಥೆ, ತುಮಕೂರು

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ಮಾರ್ಗದರ್ಶಕರು ಹಾಗೂ ಪರಿಶೀಲಕರು	
ಶ್ರೀಮತಿ ಅನಂತಲಕ್ಷ್ಮಿ ಎಸ್. ಎಸ್., ಸ.ಶಿ. ಶ್ರೀ ಎನ್.ಕೆ.ಎಸ್. ಇಂಗ್ಲೀಷ್ ಹೈಸ್ಕೂಲ್ ಉಪ್ಪಾರಪೇಟೆ, ಬೆಂಗಳೂರು	ಶ್ರೀಮತಿ ಪದ್ಮಜ ಬಿ.ಎನ್. ಹಿರಿಯ ಉಪನ್ಯಾಸಕರು, ಡಯಟ್ ತುಮಕೂರು

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1.Crop production and management

LEARNING OUTCOMES:

Students are able to

1. Define agricultural practices.
2. Explain different steps followed in agriculture
3. Recognise the importance of decomposing microorganisms
4. Differentiate between Kharif and Rabi crops with examples
5. Propose different agricultural equipments and instruments used during agricultural practices
6. Explain ploughing, levelling, sowing, irrigation methods, applying manures and fertilizers, weeding, harvesting and different methods used in the storage of harvested crops.
7. Identify the instruments used in agriculture with the help of figures.
8. Classify different kinds of Organic manures and Chemical fertilizers.
9. Suggest different measures that are followed to protect the cultivated crops from the weeds.
10. Explain the effect of over use of water, manures and fertilizers on the agricultural field.
11. Sketch the figures of agricultural instruments
12. Differentiate between organic manures and fertilizers

Weightage to objectives and different types of the questions

Questions	Remembering	Understanding	Applying	Skill/HOTS	Total
MCQ	7	2	1	-	10
1 Mark	4	4	2	-	10
2 Mark	2	4	3	1	10
3 Mark	1	4	4	--	9
4 Mark	-	2	-	3	5
5 Mark	--	--	---	1	1
TOTAL	14	16	10	5	45

Weightage to difficult level

Questions	Easy	Average	Difficult	Total
MCQ	4	5	1	10
1 mark	5	2	3	10
2 mark	5	5	--	10
3 mark	3	3	3	9
4 mark	1	2	2	5
5 mark	-	1	--	1
	18	18	9	45

**I. Choose the correct answer for the following incomplete statements from the given options.
Write the answers along with their letter of alphabet**

1 Mark

1. The first step followed in the agricultural practices is (E)
 - A. Sowing
 - B. Preparation of soil
 - C. Harvesting
 - D. Adding manure
2. The type of irrigation followed in a farm where fruits are cultivated is (E)
 - A. Drip irrigation
 - B. Sprinkle irrigation
 - C. Chain Pump and Rahat type of irrigation
 - D. Moat type of irrigation
3. A process that represents cultivation of Crops is, growing of (A)
 - A. Flowers on house roofs
 - B. Different kinds of plants in a garden
 - C. Different plant in a empty piece of land
 - D. The same kind of plant on a large scale at one place
4. Breaking down of the soil in the agricultural field before sowing is done by (A)
 - A. tractor, hoe, seed drill
 - B. plough, hoe, cultivator
 - C. plough, seed drill, tractor
 - D. bullock, tiller, tractor

5. “Farmer friend” among the following is (E)
- A. Rat
 - B. Earthworm
 - C. Cattle
 - D. Decomposers
6. The instrument that can be used for loosening of the soil, sowing seed and also for dweeding is, (E)
- A. plough
 - B. leveller
 - C. hoe
 - D . cultivator
7. Growing different crops alternatively on the same land is known as (A)
- A. crop rotation
 - B. Intercropping
 - C. multi cropping
 - D. mixed cropping
8. Identify an incorrect statement among the following related to compost manures. They (A)
- A. contain large quantity of organic matter
 - B. increase water holding capacity of the soil
 - C. are produced naturally
 - D. lead to environmental pollution
9. The nutrient that will be fixed to the soil by rhizobium bacteria is (D)
- A. phosphorous
 - B. potassium
 - C. nitrogen
 - D. carbon
10. The sprinkler method of irrigation is adapted in (A)
- A. coffee plantations
 - B. in paddy fields
 - C. Mango plantation
 - D. in ragi fields

II. Answer the following .

1Mark

11. Mention the seasons for the cultivaton of rabi crops and kharif crops? (E)
12. Suggest a measure to check damaged seeds before sowing. (A)

13. What is irrigation? (E)
14. Give two examples for weedicides (D)
15. How is the 'combine' equipment being used in agriculture? (A)
16. Write two examples for chemical fertilizers. (D)
17. Name the bacteria present in the root nodules of leguminous plants. (D)
18. What is harvesting? (E)
19. What is animal husbandary? (E)
20. Name the instrument used for effective sowing of seeds in the fields. (E)

III. Answer the following .

2Marks

21. What is ploughing ? List any two advantages of ploughing. (E)
22. Draw the sketch of the agricultural instrument 'hoe' and label 'plough shaft'. (A)
23. What are the qualities should seeds have to give high yield? (E)
24. Mention the benefits of using seed drill in the agricultural fields? (E)
25. How is compost manure be prepared? Write its any two advantages. (A)
26. Mention different techniques that are followed to store the harvested grains. (A)
27. Suggest different strategies that are followed to remove the weeds that grow in between the crops. (E)
28. "Animal husbandry is a supportive occupation to a farmer for obtaining good yield in the fields" support the statement with two reasons. (A)
29. "Drip irrigation is considered as a better irrigation method" justify this statement scientifically. (A)
30. Arrange the following agricultural practices in the proper order as farmers follow in their field; .Irrigation, Preparation of soil, Adding manure and fertilizer, Sowing, Storage, Harvesting, Protection from weeds. (E)

IV. Answer the following .

3 Marks

31. What are Rabi crops? Give two examples
32. Classify the following crops into kharif and Rabi crops. (E)
soyabean, wheat, mustard, groundnut, paddy, gram, linseed, cotton, Maize, Ragi.
33. List any four importances of preparing soil before sowing. (A)
34. Mention the use of the following instruments in the field of agriculture. (A)
a. Leveller b. Sickle c. Cultivator
35. Using seed drill in sowing of seeds is better than broad costing of seeds in the fields. How? Explain. (D)

36. Mention any two differences between manures and fertilizers? (E)
37. “Both manures and fertilizers must be used judiciously” support the statement with suitable reasons. (A)
38. A student ‘X’ wants to eat unwashed grapes ,then the student ‘Y’ stops X student by eating that grapes. Justify the action student Y with reasons. (D)
39. What happens if the harvested grains are stored without proper drying? (A)

V. Answer the following.

4 Marks

40. The three cups A,B and C contain germinated seeds. Different cultivation methods are followed as given below. Read the data and answer the questions tha follow.

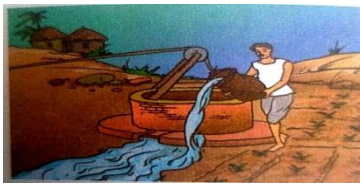
Cup A: Manure is added

Cup B: Fertilizer is added

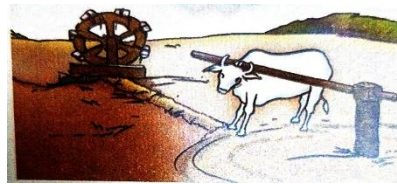
Cup C: Neither manure nor fertilizer is added.

- Which Cup shows the least growth of seeds and why?
- Which Cup shows the highest growth of seeds and why? (A)

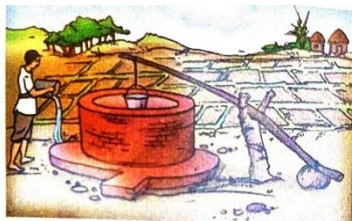
41. Identify and name the Irrigation methods that are depicted in the below pictures . (E)



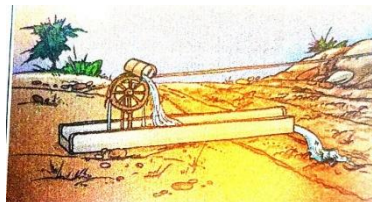
A



B



C



D

42. Continuous cultivation of the same crop in the same field should be avoided. Why? Mention disadvantages of over supply of water to the agricultural fields. (D)
43. Suggest different strategies that can be adopted to maintain the fertility of the soil in agricultura fields. (A)
44. Compare crop rotation method with inter cropping method with examples. (D)

VI. HOT (Higher order thinking) question

5 Mark

45. Imagine, a farmer is facing the scarcity of water during the cultivation of fruits in his farm. (A)
Suggest suitable solutions to the farmer to overcome this problem along with effects of the solutions.

Note: The letters (E), (A) , (D) at the end of the questions indicate
E-easy A-average D- difficult

2.MICRO ORGANISMS FRIEND AND FOE

Learning outcomes:- Students are able to,

1. Write the meaning of microorganisms.
2. Classify different types of microorganisms.
3. Identify the habitats of different types of microorganisms.
4. Explain about the benefits of some microorganisms in the field of agriculture,medicine and industries including uses in daily life.
5. Learn about the diseases caused by microorganisms in both plants and animals.
6. Define pathogens and communicable diseases with specific examples.
7. Differentiate between antibiotics and antibodies .
8. Mention certain examples for antibiotics.
9. List different modes of transmission of communicable diseases.
10. Suggest measures to control the communicable diseases.
11. Learn about different methods of food preservation .
12. Understand the nitrogen cycle.
13. Sketch paramecium,chlamydomonas,penicillin,bread mould including nitrogen cycle.

Weightage to objectives and different types of the questions :

QUESTIONS	REMEMBERING	UNDERSTANDING	APPLYING	SKILL/HOTS	TOTAL
MCQ	4	4	2	-	10
1 MARK	2	4	2	-	08
2 MARKS	2	2	2	1	07
3 MARKS	1	1	1	-	03
4 MARKS	-	1		-	01
5 MARKS	-	-	-	-	29

Weightage to difficult level:

TYPES	EASY	AVERAGE	DIFFICULTY	TOTAL
MCQ	03	04	03	10
VSA	03	03	02	08
SA	00	03	04	07
LA(3m)	00	01	02	03
LA(4m)	00	01	00	01
LA(5m)	00	00	00	00
TOTAL	06	12	11	29

I. Choose the correct option for the following incomplete statements/ questions and write the answers along with its letter of alphabet . (1 mark each)

1. Yeast is used in the preparation of (**EASY**)
A.sugar
B.alcohol
C.hydrochloric acid
D.oxygen
2. The conductor of malarial parasite is (**EASY**)
A.anaphilis female masquito
B.cockroach
C.housefly
D.butterfly
3. common carrier of most of the communicable diseases is (**AVERAGE**)
A.ant
B.spider
C.fly
D.dragonfly
4. The fermentation of bread and idli batter is due to (**EASY**)
A.heat
B.grinding
C. yeast cellsdevelopment
D.bacterial action
5. The process of conversion of sugar into alcohol is (**AVERAGE**)
A.decomposition
B.nitrogen fixation
C.fermentation
D.sedimentation
6. An antibiotic among the following is (**DIFFICULT**)
A.adrenaline
B.Streptomycin
C.billirubin
D.insulin
7. Thyroid:Thyroxine::-----:Estrogen (**AVERAGE**)
A.testes
B.ovaries
C.pancreas
D.pituitary
8. An additive commonly used to preserve pickles is (**AVERAGE**)
A.vinegar
B.common salt
C.mustard oil
D.chilli powder
9. A method that can be adapted for the storage of vegetables is (**DIFFICULT**)
A.salting
B.freezing
C.drying
D.cold storage

10. Bacteria that live inside the root nodules of leguminous plants are **(DIFFICULT)**
A. Rhizobium
B. Vibrio comma
C. Lactobacillus
D. Pseudomonas

II. ANSWER THE FOLLOWING :- (ONE MARK EACH)

11. What are microorganisms? **(EASY)**
12. Where do microorganisms live? **(EASY)**
13. Name different types of microorganisms. **(AVERAGE)**
14. Which bacterium converts milk into curds? **(EASY)**
15. Who discovered vaccine against chicken pox disease? **(AVERAGE)**
16. Name the nitrogen fixing organisms? **(DIFFICULT)**
17. Name the microbe responsible for anthrax disease? **(DIFFICULT)**
18. Define pasteurization. **(AVERAGE)**

III. Answer the following (Two marks each)

19. Write the characteristics of viruses. **(DIFFICULT)**
20. What are antibiotics? Who was known as the father of antibiotics? **(AVERAGE)**
21. How do vaccines protect us against diseases? Who was known as the father of vaccination? **(DIFFICULT)**
22. How do microorganisms clean our environment? Explain. **(AVERAGE)**
23. How do antibiotics differ from vaccines? **(DIFFICULT)**
24. Draw the sketches of following microbes **(AVERAGE)**
i) Chlamydomonas ii) Paramecium
25. Name the group of following microbes to which they belong. **(DIFFICULT)**
i) Bacteriophage ii) Aspergillus iii) Amoeba iv) Volvox

IV) Answer the following :(Three mark)

26. What are communicable diseases? Name any two such diseases that communicate through contaminated water and air in humans. **(DIFFICULT)**
27. Why should we cover our nose and mouth while coughing and sneezing? **(AVERAGE)**
28. What is food poisoning? What are the symptoms of this condition? **(DIFFICULT)**

V. Answer the following: (Four mark)

29. Briefly explain any four methods of food preservation. **(AVERAGE)**

3. Coal and petroleum.

Learning Outcomes:
Students are able to,

1. Explain the process of coal formation from ancient plant matter under heat and pressure.
2. Mention the properties of coal, petroleum and coke
3. List the uses of coal, coke and coal tar.
4. Recall the definitions of fossil fuels and examples for the same.
5. Explain the formation of petroleum from the remains of marine organisms.
6. Narrate the process of petroleum refining.
7. State the meaning of fractional distillation and principle adopted in this process.
8. List the different fractions of petroleum and their uses.
9. Evaluate the effects of over use of coal and petroleum on the environment.
10. Suggest suitable measures to prevent air pollution.
11. Predict the need for conservation of fossil fuels..
12. Explore alternative energy sources available.

Weightage to difficulty level

TYPES	EASY	AVERAGE	DIFFICULTY	TOTAL
MCQ	05	07	03	15
VSAA	03	05	02	10
SA	02	02	01	05
LA (3 MARKS)	01	02	01	04
LA (4 MARKS)	-	02	01	03
TOTAL	11	18	08	37

Weightage to types of Objectives

QUESTION S	REMEMBERANC E	UNDERSTANDIN G	APPLICATIO N	SKILL	TOTAL
MCQ	03	06	03	03	15
1 MARK	02	04	02	02	10
2 MARKS	01	02	01	01	05
3 MARKS	01	02	01	-	04
4 MARKS	-	01	01	01	03
TOTAL	07	15	08	07	37

I Choose the correct answer for the following incomplete statements/ questions from the given options and write the answer along with the letter of alphabet . (one mark each)

- 1) A substance that is not an example for the natural resource is (Easy)
- A) Air
 - B) Water
 - C) Soil
 - D) Plastic

- 2) An inexhaustible resource among the following is **(Easy)**
A) Coal
B) Petroleum
C) Solar light
D) Natural gas
- 3) The fuel that does not belong to the group among the following is **(Average)**
A) Coal
B) Petrol
C) Natural gas
D) Uranium
- 4) The process of formation of coal is known as **(Average)**
A) Evaporation
B) Carbonization
C) Solidification
D) Condensation
- 5) The gas liberated by the burning of Coal is **(Difficult)**
A) Carbon di oxide
B) Nitrogen dioxide
C) Chlorine
D) Oxygen
- 6) Earlier it was used in railway engines to produce steam to run the engine.
The fuel used to produce steam earlier to run rail engines is **(Average)**
A) Coal
B) Coal tar
C) Graphite
D) Coal gas
- 7) A product of coal used to extract metals in their pure state is **(Difficult)**
A) Graphite
B) Coke
C) Coal tar
D) Coal gas
- 8) A dark viscous liquid with an unpleasant smell among the following is **(Average)**
A) Coke
B) Bitumen
C) Coal tar
D) Lubricant oil
- 9) Insect repellent that is obtained by the coal tar **(Average)**
A) paraffin
B) naphthalene
C) bitumen
D) benzene
- 10) Coal tar is widely used in the **(Average)**
A) extraction of metals
B) manufacture of lubricants
C) production of water gas

- D) surface coating of roads
- 11) Petroleum is formed by the (Average)
 A) decomposition of plants under the earth crust
 B) escape oxidation of dead sea organisms under the sea bed
 C) decaying of dead terrestrial animals
 D) eruptions of lava from volcanoes
- 12) The process of separation of byproducts of petroleum is (Average)
 A) refining
 B) distillation
 C) crystallisation
 D) condensation
- 13) A petroleum product that is commonly used for dry cleaning is (Easy)
 A) Petrol
 B) diesel
 C) kerosene
 D) lubrication oil
- 14) A fossil fuel that is commonly known as “Black gold” among the following is (Average)
 A) coke
 B) graphite
 C) petroleum
 D) coal
- 15) An incorrect statement related to the natural gas is, this gas (Difficult)
 A) compresses to the smallest volume.
 B) shows excellent efficiency on combustion.
 C) does not responsible for air pollution
 D) be transported easily

II. Answer the following questions , (One mark)

- 16) Which natural resource is available in unlimited quantities in nature ? (Easy)
 17) Give an example for inexhaustible and exhaustible natural resources. (Easy)
 18) What are fossil fuels ? (Difficult)
 19) Name the fossil fuel used in thermal power plant. (Easy)
 20) Mention the products obtained by the dry distillation of coal. (Average)
 21) Name the purest form of carbon. (Average)
 22) What is fractional distillation? (Difficult)
 23) Mention any two uses of paraffin wax . (Average)
 24) Expand LPG . (Average)
 25) Which petroleum products can be selected for the manufacture of chemical fertilizers? (Average)

III. Answer the following questions : (Two marks)

- 26) Write the differences between inexhaustible and exhaustible natural resources. (Easy)
 27) What is carbonization ? (Difficult)
 28) List any two uses of coal . (Easy)
 29) What are petrochemicals ? Give two examples. (Average)
 30) Nowadays diesel vehicles are being replaced by electric vehicles. Does this measure good or not? Support your answer with two reasons. (Average)

IV. Answer the following questions :**(Three marks)**

- 31) Explain the process of coal formation. **(Difficult)**
- 32) Classify the following into natural and man made things .
Water, Glass, Cotton, Nylon, Graphite, polyester, **(Easy)**
- 33) “The fossil fuels must be used sparingly”. Justify this statement with suitable explanation. **(Average)**
- 34) How is coal gas produced? Write any two uses of this. **(Average)**

V. Answer the following questions :**(Four marks)**

- 35) Draw the sketch to show the deposits of petroleum and natural gas. **(Average)**
- 36) How petroleum is formed in the nature? Explain. **(Average)**
- 37) The following table shows the total power shortage in India from 1991- 1997. Show the data in the form of graph.
Y-axis
X- **(Difficult)**
- (plot shortage percentage for the years on the axis)

Sl.no	Year	Shortage(%)
1	1991	7.9
2	1992	7.8
3	1993	8.3
4	1994	7.4
5	1995	7.1
6	1996	9.2
7	1997	11.5

4.Combustion and flame

Learning outcomes: students are able to

1. Define the terms combustion and ignition temperature.
2. Classify the combustible and noncombustible substances
3. List the essential factors necessary for combustion.
4. Explain different methods of extinguishing fire
5. Recognise the inflammable substances in day to day life.
6. Recognise different types of combustion.
7. Differentiate between different types of combustion.
8. Draw the diagram showing different zones of the candle flame.
9. List the characteristics of good fuel.
10. Explain the efficiency of fuel and harmful effects caused by burning of fossil fuels.

Weightage to types of Objectives

	Remembering	Understanding	Application	Skill	Total
MCQS	7	4			11
1mark	4	3			7
2marks	3	8	6		17
3mark	1	7			8
	15	22	6		43

Difficulty Level question's weightage

	Easy	Average	Difficult	Total
MCQS	4	5		11
1mark	5	2		7
2marks		10		17
3mark	4	3	1	8
	13	20	10	43

I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet; (1 mark)

1. A fuel that is not produce flame but generate heat on burning is (Easy)
 - A. wood
 - B. fuel oil
 - C. petrol
 - D. coal

2. One of the following is not a characteristic of an ideal fuel. A fuel that (Average)
 - A. is cheap
 - B. is readily available
 - C. produces large amount of heat
 - D. liberates more carbon dioxide

3. Combustion is always (Average)
 - A. an exothermic reaction
 - B. an endothermic reaction
 - C. gives flame
 - D. non-volatile reaction

4. Burning of LPG is an example for (Average)
 - A. spontaneous combustion
 - B. slow combustion
 - C. rapid combustion
 - D. explosion

5. If charcoal is burnt in a closed room then the gas released is (Average)
 - A. sulphur dioxide
 - B. nitrogen dioxide
 - C. carbon monoxide
 - D. nitrogen oxide

6. The SI unit of calorific value of a fuel is (Easy)
 - A. kJ/g
 - B. kJ/kg
 - C. kcal/g
 - D. kcal/kg

7. In fire extinguishers carbon dioxide is stored in the form of (Difficult)
 - A. solid at low pressure
 - B. liquid at low pressure
 - C. liquid at high pressure
 - D. gas at high pressure

8. The role of water during extinguish of fire is, water (Average)
 - A. breaks the supply of oxygen and cools the fuel
 - B. makes the fuel heavier as it soaks it
 - C. splits into oxygen and hydrogen in turn leads to explosion.
 - D. puts off fire immediately

- 9.. The hottest zone of the candle flame is (Easy)
 - A. inner zone

- B. innermost zone
- C. outermost zone
- D. middle zone

10. A fuel having the highest calorific value is (Average)

- A. LPG
- B. petrol
- C. hydrogen
- D. CNG

11. A gaseous fuel among the following is (Easy)

- A. bitumen
- B. methane
- C. kerosene
- D. gasoline

II Answer the following questions : (1 mark)

12. Name the non metal that catches fire by exposing it to air. (Easy)
13. Name the black coloured fuel that is as hard as stone. (Average)
14. Define 'combustion'. (Easy)
15. Name a commonly used fire extinguisher. (Easy)
16. Which fuel is generally used for domestic purposes? (Easy)
17. What is the ignition temperature? (Easy)
18. Blanket will be wrapped around a person who caught on fire. What is the reason? (Average)

III. Answer the following questions. (2 marks)

19. What type of combustion is the burning of crackers? Give reason for your answer. (Average)
20. You are provided with three watch glasses containing milk, petrol and mustard oil respectively. If you bring a burning candle near to these materials then which of these materials catch fire instantly and why? (Difficult)
21. Imagine an instance where a person is preparing potato chips and unexpectedly that oil catches fire. That person pours water to put off the fire. Is this action applied to put off the fire is suitable or not suitable? Give clarification to your answer. If you disagree this method then suggest a proper method that can be followed in this situation to extinguish fire. (Difficult)
22. When kerosene is burnt that gives flame but charcoal does not produce flame on burning. Give reason. (Average)
23. Water is not used to control fire where there is involvement of electrical equipments. Give reason. (Average)
24. Paper alone itself catches fire easily but not the piece of paper wrapped around aluminium pipe. Explain the reason. (Difficult)
25. List the factors essential for combustion? Write the byproducts of complete combustion. (Average)
26. How do fire extinguishers generally work to put off fire?. (Average)
27. Explain the working mechanism of a soda-acids fire extinguisher. (Difficult)
28. List the characteristics of an ideal fuel. (Average)
29. Mention the harmful effects caused by burning of fossil fuels. (Average)
30. Why does a goldsmith use the outermost zone of the flame to melt gold and silver? (Average)
31. "Food can be considered as a fuel to our body." How? Explain. (Difficult)
32. Production of heat and light in the sun is combustion or not? Explain. (Difficult)
33. Initially some pieces of paper or kerosene will be used to ignite wood pieces. Is this procedure essential? Explain. (Difficult)
34. Differentiate between the inflammable and non flammable substances (Average)
35. Carbon dioxide acts as a fire extinguisher. How? (Average)

VII Answer the following questions:.

(3 marks)

36. Explain an activity to show that the air is necessary for combustion. (Average)
37. Give two examples for solid, liquid and gaseous fuels. (Easy)
38. Mention the difference between rapid combustion and spontaneous combustion with one example for each. (Average)
39. Why is LPG considered as a better domestic fuel than wood? Mention one more such ideal fuel used in automobiles. (Average)
40. Name different zones of a flame. Mention the property of each zone. (Easy)
41. What is calorific value? Write the calorific value of one mole of butane. Hydrogen cannot be used as a domestic fuel. Why? (Easy)
42. a) Why does a matchstick not catch fire on its own at room temperature? Explain. (Difficult)
- b) What is Phosphorescence? (Easy)
43. Name the types of combustion and give an example for each. (Easy)

8. Force and Pressure

Learning Outcomes :

Students are able to

1. Define force
2. Identify the situations where force is applied.
3. Recognise push and pull types of actions applied during different daily life situations.
4. Narrate and list the effects of force on the objects.
5. Name different types of forces.
6. Mention the examples for different types of forces.
7. Differentiate between force and pressure
8. Differentiate between different kinds of forces.
9. Decide how frictional force acts as 'friend' and as 'foe' in day to day life situations
10. Prove that liquids and gases also exert pressure with the help of demonstrations.
11. Define atmospheric pressure
12. Mention the importance of gravitational force

QUESTIONS	REMEMBERANCE	UNDERSTANDING	APPLICATION	SKILL	TOTAL
MCQ	8	4	2	–	14
1 MARK	5	1	1	–	7
2 MARKS	3	1	2	–	6
3 MARKS		1	1	–	2
4 MARKS	1	–	1	–	2
5 MARKS	–	–	–	–	–
	17	7	7	–	31

Difficulty Level question's weightage

Questions	Easy	Average	Difficult
1 mark	9	9	2
2 marks	1	3	3
3 marks	-	1	2
4 marks	-	-	1
5 marks	-	-	-
	10	13	8

I. Choose the correct answer for the following incomplete statements/questions and write the correct answer along with its letter of alphabet. (1 mark)

1. The SI unit of pressure is (Easy)

- A. Newton
- B. Newton/meter
- C. Newton/ kilogram
- D. Newton/meter²

2. The pressure exerted by liquids is (Average)

- A) Increases with depth
- B) Decreases with depth
- C) Remains constant
- D) First increases and then decreases

3) The pressure exerted at the bottom of liquids depends on (Average)

- A) The area of the container
- B) The shape assumed by the liquid
- C) The shape of the reservoir
- D) The volume of the liquid

4) The pressure exerted at a given point in liquids is (Average)

- A) Directly proportional to the depth of the liquid at that point
- B) Directly proportional to the density of the liquid
- C) Both A and B
- D) Inversely proportional to the density and volume of the liquids

5) Pressure exerted by liquids is always more towards (Easy)

- A) the walls of the container
- B) the bottom of the container
- C) all the directions
- D) the surface only

6). one that is not an effect of force on an object among the following is, the force changes (Average)

- A) shape of that object.

- B) mass of that object.
 C) the direction of movement
 D) the position of that object.
7. An illustration for a contact force is (Easy)
 A) falling of an apple from apple tree
 B) repulsion between the like poles of two magnets
 C) pushing a car
 D) attraction of paper pieces towards a charged plastic comb
8. Statement A: Magnetic force is a non-contact force
 Reason B : Non-contact force does not involve contact between objects (Easy)
 A) Statement A is correct; reason in the statement B is incorrect
 B) Statement A is incorrect ;reason in the statement B is correct
 C) Both of the statements are correct
 D) Both of the statements are incorrect
10. Force means... (Average)
 A) pushing an object
 B) either pushing or pulling of an object
 C) pulling an object
 D) displacing an object
11. When we rub our palms then the average temperature of the body increases a little . The force responsible for this effect is (Easy)
 A) Magnetic force
 B) Gravitational force
 C) Electrostatic force
 D) Frictional force
12. A situation in which the least friction is found is (Easy)
 A) walking on grass lawn with bare foot
 B) running cycle on muddy road
 C) writing on a paper with a pen
 D) rotation of a machine with the help of ball bearings
13. An arrangement that indicates the descending order of friction among the following is (Difficult)
 A) Rolling friction, static friction, sliding friction.
 B) Rolling friction, sliding friction, static friction
 C) Static friction, sliding friction, rolling friction
 D) Sliding friction, static friction, rolling friction
14. If you push a wooden box on a sandy floor, marble floor and carpet floor then the degree of friction increases as in the order (Difficult)
 A) Sand floor, marble floor, carpet floor
 B) Carpet floor, sand floor, marble floor
 C) Marble floor, carpet floor, sand floor
 D) Marble floor, sand floor, carpet floor

- II. Answer the following questions. (1 mark)
- 15) Name the instrument used to measure the pressure difference of liquids. (Easy)
 - 16) What is 'gravitational force'? (Easy)
 - 17) Force is considered as Vector quantity. Why? (Average)
 - 18) Define 'atmospheric pressure'. (Average)
 - 19) What is 'force of gravity'? (Easy)
 - 20) Define 'pressure'. (Average)
 - 21) "Submarines are made of strong and thick materials". Why? (Average)

III. Answer the following questions. (2 marks)

- 22) Explain an experiment to show that the pressure of liquids depends on their densities. (Difficult)
- 23) Do liquids and gases also exert pressure? Justify your answer. (Difficult)
- 24) Identify the type of force that is depicted in the following examples. (in terms of contact or non-contact force) (Average)
 - i) Extraction of sugar cane juice using a suitable device.
 - ii) Attraction of iron filings towards a magnet.
 - iii) Coconut falling from a tree.
 - iv) Lifting of a rice bag
- 25) List any four effects of force on the objects. (Average)
- 26) Name the two forces exerted on a ball when it is thrown downwards from the terrace of a tall building towards the ground. (Average)
- 27) List any two advantages of frictional force. (Easy)
- 28) Is it possible to walk easily on wet ground? Justify your answer. (Difficult)

IV Answer the following questions; (Three Marks)

- 29 .Give reason. (Difficult)
 - a) A camel walks easily on sand.
 - b) Sailors who swim in the deep sea should wear prescribed clothes.
 - c) A lizard easily moves on a wall.
- 30) Explain the reasons for the following practices. (Difficult)
 - a) A sharp knife will be used to cut fruits/to chop vegetables but not a blunt knife.
 - b) Usually, people keep a cloth or a rope while carrying heavy objects on their heads.

V. Answer the following questions. (Four marks)

- 31) a) How does the sun control planetary motion in our solar system? (Difficult)
- b) What causes the downward movement of river water?
- c) ' Frictional force acts as both advantageous and disadvantageous'. How? Justify with illustrations .

9. Friction

Learning out comes:

Students are able to

1. State the meaning of friction.
2. Mention the factors on which friction depend.
3. Categorize different types of friction.
4. Recall the effects of friction.
5. Explain that friction is a necessary evil.
6. Narrate the illustrations for different types of friction.
7. Suggest the strategies to increase or decrease the friction accordingly.
8. Give reasons for the existence of certain designs/ patterns/ structures of materials/ floor/ articles etc. in our day to day life.

QUESTIONS	KNOWLEDGE	UNDERSTANDING	APPLICATION	SKILL	TOTAL
MCQ	5	6	2	-	13
1 MARK	2	3	3	-	08
2 MARKS	1	1	2	-	4
3 MARKS	-	-	1	-	1
4 MARKS	-	-	-	-	-
5 MARKS	-	-	-	-	-

**Weightage
to types of
Objectives**

Level	TYPES	EASY	AVERAGE	DIFFICULTY	TOTAL	Difficulty question's weightage
	MCQ	04	05	04	13	
	VSA	04	03	01	08	
	SA	00	03	01	04	
	LA(3m)	00	00	01	01	
	LA(4m)	00	00	00	00	
	LA(5m)	00	00	00	00	
	TOTAL	8	11	07	26	

I. Choose the correct answer for the following incomplete statements/questions. Write the answers along with their letter of the alphabet. (1 mark)

1) Friction is always a kind of (Average)

- A. Non contact force B. Contact force
C. Heat producing force D. Both B and C

2) The least friction is observed in (Average)

- A. Sliding friction B. Rolling friction
C. Static friction D. Fluid friction

3) Friction always (Easy)

- A. Opposes motion B. Helps in motion
C. Both A and B D. Non contact force

4) More commonly using material to reduce the friction is (Easy)

- A. Oil

- B. Grass mat
- C. Glass
- D. Water

5) An illustration for static friction is (Average)

- A. Chopping fruits using a knife.
- B. Cycling on cement roads.
- C. Pulling water from the well using a rope.
- D. Parking of a vehicle on a platform

6) A correct statement related to friction among the following is, friction (Difficult)

- A. depends on the size and quantity of the objects
- B. is observed only between solid objects
- C. is a force that opposes relative motion of the objects in contact.
- D. increases the relative motion of the objects that are in contact.

7) The shape of the aeroplane helps to (Difficult)

- A. fly up to greater heights.
- B. overcome the friction of the air.
- C. adjust the acceleration accordingly.
- D. avoid any kind of accident.

8) To sharpen the surface of a knife, it should be rubbed against a (Easy)

- A. Rock or stone
- B. Plastic material
- C. Wood
- D. Glass

9) The friction that occurs in liquids is called (Difficult)

- A. Force
- B. Pressure
- C. Drag

D. Surface tension

10) A material that has the least friction on its surface among the following is. (Average)

- A. Soaps
- B. Tyres
- C. Smooth rocks
- D. Mirrors

11) When oil is applied to door hinges, then the friction (Easy)

- A. Increases
- B. decreases
- C. remains stable
- D. stops for ever

12) The force of friction on a surface does not depend on its (Difficult)

- A. Area
- B. Texture
- C. Composition
- D. Volume

13) Finest powder will be sprinkled over the board while playing carrom because to (Average)

- A. increase the efficiency of the game.
- B. decrease the easy movement of carrom pawns
- C. feel good fragrance while playing
- D. To maintain the good condition of the carrom board

II. Answer the following questions : (1 Mark)

14) List the factors on which friction depend (Easy)

15) What is friction? (Easy)

- 16) Why are the wheels of vehicles made circular ? (Easy)
- 17) What is the direction of the friction force when objects move ? (Average)
- 18) Rollers are fitted to the luggage bags. Why ? (Average)
- 19) It is not good to walk on very smooth surfaces. (Average)
- 20) 'Objects moving on different surfaces are given specific shapes'. Mention the reason.
(Difficult)
- 21) What is the use of abrasive oils ? (Easy)

III . Answer the following questions .

(2 Marks)

- 22) Explain the importance of using spiked shoes by the players while playing. (Average)
- 23) Write the illustrations to decide that the friction generates heat. (Difficult)
- 24) Mention difference between sliding friction and static friction with an example for each. (Average)
- 25) Where are ball bearings used ? How do they work ? (Average)

IV. Answer the following questions.

(3 Marks)

- 26) "Friction is a kind of boon and also a curse" How ? Explain . (Difficult)

5.Conservation of Plants and Animals

Learning Outcomes

1. Recall the examples for National Parks, reserved forests and wildlife sanctuaries.
2. Recall the importance of plants on this planet.
3. Define the terms : desertification, flora, fauna, endemic species, endangered animals, extinct species, biosphere, ecosystem, migration , recycling , deforestation and reforestation.
4. Narrate the importance of conservation of forests and wild animals.
5. Mention the examples for endemic species, endangered species, and extinct species.
6. Distinguish between the characteristics of National Parks, reserved forests/ biosphere and wildlife sanctuaries.
7. Explain the phenomenon of desertification.
8. List the reasons for droughts and desertification.
9. Mention the reasons for deforestation and the effects of deforestation on the environment.
10. Explain the significance of project tiger which was launched by the government of India.
11. Mention the importance of ‘Red Data Book’
12. Explore the secret behind the migration of birds
13. Justify the action of collecting and recycling of waste/ used papers

Weightage to objectives and different types of the questions :

Questions	Remembering	Understanding	Applying	Skill/HOTS	Total
MCQ	3	3	1	-	7
1 Mark	2	5	1	-	8
2 Mark	1	4	1	4	10
3 Mark	1	2	--	--	3
4 Mark	--	--	3	--	3
5 Mark	--	3	---	1	4
TOTAL	7	17	6	5	35

Weightage to difficult level:

Questions	Easy	Average	Difficult	Total
MCQ	2	4	1	7
1 mark	5	3	--	8
2 mark	4	4	2	10
3 mark	2	1	--	3
4 mark	1	1	1	3

5 mark	2	--	2	4
	18	18	6	35

I. Choose the correct answer for the following incomplete statements/questions and write the answers along with their letter of the alphabet. (1 Mark)

1. A Sanctuary is (Average)
 - A) A place where plants are grown for research
 - B) An area where animals are protected from disturbance
 - C) A laboratory for studying wildlife
 - D) A zoo for endangered species
2. A process that facilitates the conservation of biodiversity is (Average)
 - A) Industrialization
 - B) Deforestation
 - C) Urbanization
 - D) Reforestation
3. The aim of the Forest (Conservation) Act is to: (Easy)
 - A) Promote industrial development
 - B) Conserve natural forests and meet the needs of people
 - C) Increase deforestation
 - D) Prohibit all the activities inside the forests.
4. The main objective of launching 'Project Tiger' by the Indian government was to (Average)
 - A) protect and maintain the population of tigers in the country.
 - B) protect the tribes from tiger attacks.
 - C) facilitate reproduction of tigers
 - D) provide balanced nutrition to the tigers
5. Main cause for the desertification is (Easy)
 - A. Overgrazing of grass by cattle
 - B. Heavy rainfall
 - C. Blowing of heavy winds
 - D. Destroy of forests
6. Bandipur and Nagarhole of Karnataka are example for (Average)
 - A) National parks
 - B) Regions of reserved biosphere
 - C) Bird's sanctuaries
 - D) Both A and B
7. Information about one of the following animals can be traced out in the Red Data Book. That animal would be (Difficult)
 - A) Dinosaur
 - B) Pink headed duck
 - C) Kashmiri stag
 - D) Asiatic Cheetah

II. Answer the following questions: (1 Mark)

8. Define biodiversity. (Easy)
9. What is deforestation? (Easy)
10. Name two famous bird's sanctuaries of Karnataka. (Average)
11. Write one difference between flora and fauna. (Easy)
12. Mention any two root causes for the drought. (Easy)
13. What is a "RED DATA BOOK"? (Average)
14. Define ecosystem. (Easy)
15. What are reserved biospheres? (Average)

III. Answer the following Questions . (2 Marks)

16. Write the difference between wildlife sanctuaries and national parks. (Easy)
17. What are 'extinct species'? Write two examples. (Average)
18. What are 'endangered species'? Give two examples. (Average)
19. What are endemic species? Give two examples. (Average)
20. How does deforestation affect rainfall? Explain. (Easy)
21. What are the effects of deforestation on soil? (Easy)
22. How does reforestation help in the conservation of flora and fauna? (Easy)
23. 'Soil erosion is more in urban areas than in rural areas.' Do you agree this statement or not? Support your answer. (Average)
24. What were the major objectives of launching 'Project Tiger'? (Difficult)
25. 'People living in the regions closer to the forests are also responsible for deforestation.' Justify this statement. (Difficult)

IV. Answer the following Questions: (3 Marks)

26. Extinction of any species will affect that ecosystem. How? Explain this statement. (Average)
27. Mention the consequences of deforestation on wildlife? (Easy)
28. Consolidate the measures that are followed to conserve wildlife. (Easy)

V. Answer the following questions : (4 Marks)

29. List any four effects of deforestation on the environment. Suggest any four measures to reduce it. (Average)
30. Disturbing any ecosystem results in the gradual extinction of 'Flora' and 'Fauna' of that place. How? Explain. (Difficult)
31. How can each individual contribute to the conservation of plants and animals? Suggest two measures that could be followed practically. (Easy)

VI. Answer the following questions : (5 Marks)

32. Explain the role of forests in maintaining ecological balance. How does deforestation disrupt this balance? (Easy)
33. Discuss the objectives and achievements of 'Project tiger' in India, with reference to Karnataka's efforts. (Difficult)
34. Explain the impact of human activities on wildlife conservation. Suggest three measures to promote conservation. (Easy)
35. What is the importance of protecting endangered species? Discuss with an example and suggest two conservation strategies. (Difficult)

6.REPRODUCTION IN ANIMALS

Learning outcomes,

Students are able to,

1. Learn to define reproduction and types of reproduction.
2. Explain the sexual reproduction.
3. Name the reproductive structures in humans mention and their functions.
4. Learn to differentiate between oviparous and viviparous organisms with examples.
5. Explain the different stages of life cycle of frog
6. Narrate the meaning of metamorphosis.
7. Define the meaning of asexual reproduction.
8. Name different types of asexual reproduction.
9. Identify the differences between budding and binary fission.
10. Mention the meaning of cloning.

Weightage of different types of objectives:

QUESTIONS	REMEMBERANCE	UNDERSTANDING	APPLICATION	SKILL	TOTAL
MCQ	3	4	4	-	11
1 MARK	5	6	5	-	16
2MARKS	3	4	3	1	11
3 MARKS	1	-	-	4	05
4 MARKS	-	1	-	-	01
5 MARKS	-	1	-	-	01
TOTAL	12	15	12	05	45

Weightage of difficulty level:

TYPES	EASY	AVERAGE	DIFFICULT	TOTAL
MCQ	4	3	4	11
VSA	5	6	5	16
SA	4	4	3	11
LA (3 MARKS)	1	4	-	05
LA (4MARKS)	-	1	-	01
LA (5MARKS)	1	-	-	01

TOTAL	15	18	12	45
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I. Four alternatives are given to the following incomplete statements; choose the appropriate answer from the following.

1. The part of the male re[productive system where sperms are produced is (EASY)

- A. Ovary
- B. Testes
- C. Uterus
- D. Fallopian tube

2. The phenomenon in which children resemble to their parents is (EASY)

- A. Variation
- B. Evolution
- C. Heredity
- D. Mutation

3. The process of development of tadpole into an adult frog is called (AVERAGE)

- A. Fertilization
- B. Metamorphosis
- C. Regeneration
- D. Budding

4. The number of chromosomes found in the zygote is (AVERAGE)

- A. One pair
- B. Two pairs
- C. Three pairs
- D. Four pairs

5. The process of fusion of male and female gametes is (EASY)

- A. Metamorphosis
- B. Fertilization
- C. Heredity
- D. Variation

6. The internal fertilization in humans takes place (AVERAGE)

- A. Inside of the female body
- B. In the surrounding medium
- C. Outside of the female body
- D. Inside of the male body

7. The type of reproduction found in hydra is (AVERAGE)

- A. Binary fission
- B. multiple fission
- C. Fragmentation
- D. Budding

8. Uninucleated structure formed by the fusion of gametes is (AVERAGE)

- A. Sperm
- B. Ovum
- C. Zygote
- D. Embryo

9. Egg laying animals are (EASY)

- A. Viviparous
- B. Oviparous
- C. Mammals
- D. Vertebrates

10. The number of nuclei present in a zygote (EASY)

- A. One
- B. Two
- C. Three
- D. Four

11. The method of reproduction in amoeba is (EASY)

- A. Binary fission
- B. Multiple fission
- C. Fragmentation
- D. Budding

II. Answer the following questions: (1 mark)

12. What is reproduction? (EASY)

13. Mention the importance of reproduction. (AVERAGE)
14. Mention the types of reproduction. (AVERAGE)
15. What is sexual reproduction? (EASY)
16. Name the structures of the human male reproductive system. (AVERAGE)
17. Name the structures of the human female reproductive system. (AVERAGE)
18. What is the importance of the tail like structure in a sperm cell? (DIFFICULT)
19. What is fertilization? (EASY)
20. What is zygote? (EASY)
21. Expand IVF. (AVERAGE)
22. What is in vitro fertilization? (AVERAGE)
23. What is implantation with reference to the reproduction in human beings? (AVERAGE)
24. In which part of the female reproductive system the implantation process takes place?
(AVERAGE)
25. What is a test tube baby? (DIFFICULT)
26. What is an embryo? (EASY)
27. What is metamorphosis? (EASY)

III. Answer the following questions. (2 marks)

28. Mention the differences between asexual and sexual reproduction. (AVERAGE)
29. Name the male and female reproductive structures of flowers. (DIFFICULT)
30. Write the differences between internal and external fertilization. (AVERAGE)
31. Distinguish between zygote and embryo. (DIFFICULT)
32. What are oviparous organisms? Give an example. (DIFFICULT)
33. What are viviparous organisms? Give an example. (EASY)
34. Write the stages of the life cycle of a frog. (EASY)
35. What is budding? Give an example. (AVERAGE)
36. Draw the diagram showing budding in hydra and label the bud. (EASY)
37. What is binary fission? Give an example. (AVERAGE)
38. What is cloning? Give an example. (EASY)

IV. Answer the following questions. (3 marks)

39. Draw the diagram showing the structure of human male reproductive system and label the following parts. i) Testis ii) Ureter (AVERAGE)
40. Draw the diagram showing the human structure of human female reproductive system and label the following parts. (AVERAGE)
 - i) Ovary ii) Fallopian tube.
41. Draw the structure of sperm and label the following parts.
 - i) head ii) tail. (EASY)
42. What is asexual reproduction? Mention the types of asexual reproduction? (AVERAGE)
43. Draw the diagrams to show the binary fission in amoeba and label young ones. (AVERAGE)

V. Answer the following questions. (4 marks

44. Explain the stages involved in the life cycle of frog. (AVERAGE)

VI. Answer the following questions (FIVE MARK)

45. Mention the type of reproduction takes place in the following organisms. (AVERAGE)

A. Amoeba B. Plasmodium C. Hydra D. Bryophyllum E. Dolly sheep

7.Reaching the age of adolescence

Learning Outcomes;

1. Differentiate between adolescence, adulthood and youth.
2. Explain the physical, psychological, intellectual and psychological changes that occur during puberty.
3. Identify the different changes seen in boys and girls during puberty.
4. Explain the signs of sexual development seen in the boys and in the girls during puberty.
5. Name the hormones responsible for the secondary sexual traits that will be appeared in the boys and the girls during puberty/explain the functions of sex hormones.
6. Explain the process of sex determination of a child in humans.
7. Define the meaning of the exocrine glands.
8. Name the various exocrine glands in the human body with their locations.
9. Match the hormones secreted by the exocrine glands and the major functions of those hormones.
10. Narrate the need for the healthy nutrition during adolescence.
11. Explain the role of hormones in the life cycle of insects and frogs.
12. Identify the importance of balanced diet during adolescence.
13. List the personal hygiene measures that are to be followed during adolescence.

Difficulty Level question's weightage

QUESTIONS	REMEMBERANCE	QUESTIONS 1 mark	EASY 9	AVERAGE 5	DIFFICULT 3	SKILL	TOTAL
MCQ		4 marks	4 1	5	-1	-	6
1 MARK		6 marks	2 2	2	-1	-	9
2 MARKS		4 marks	- 6	-	-1	-	10
3 MARKS		5 marks	- 1	-	-1	-	3
4 MARKS		-	15 1	12	3 1		2
	14		10	5	1		30

WEIGHTAGE TO OBJECTIVES

I. Four alternative answers are given to the following incomplete statements/questions. Choose the correct answer and write the answer with its letter of alphabet . (1 mark)

1. The period of life when signs of reproductive maturity begin to appear in humans is (Easy)

- A. Infancy
- B. Childhood
- C. Teenage
- D. Old age

2. The age at which adolescence usually begins (Easy)

- A. 11 to 19 years
- B. 12 to 19 years
- C. 13 to 18 years
- D. 12 to 21 years

3. Gland that secretes the hormone insulin is (Average)

- A. Pancreas
- B. Adrenal gland
- C. Pituitary gland
- D. Thyroid gland

4. Hormone that prepares our body for different situations of anxiety (Difficult)

- A. Adrenaline
- B. Thyroxine
- C. Estrogen
- D. Pituitary

5. The process of union of sperm and egg (easy)

- A. Zygote
- B. Fertilization
- C. Menstruation
- D. Metamorphosis

6. Hormone that controls metamorphosis in frogs (Average)

- A. Adrenaline
- B. Thyroxine
- C. Estrogen
- D. Pituitary

7. Hormone that brings male traits in boys and the gland that secretes this hormone (Average)

- A. Insulin-Pancreas
- B. Testosterone-Testicle
- C. Estrogen-ovary
- D. Thyroxine-thyroid gland

8. A zygote that develops into a female child has (Average)

- A. 23 pairs of XX chromosomes

- B. 23 XX chromosomes
- C. 22 pairs of XX chromosomes, one pair XY chromosome
- D. 22 XX chromosomes, one XY chromosome

9. The microorganism that causes AIDS is (Average)

- A. Human Immuno Virus
- B. Tobacco Mosaic Virus
- C. Human Papilloma Virus
- D. Herpes Simplex Virus

10. One habit to which teenagers can say 'no' among the following is (difficult)

- A. Sleeping for long time.
- B. Consuming artificial nutrients for the better growth of the body.
- C. Giving more priority to personal hygiene.
- D. Consuming more processed foods.

II Answer the following questions. (1 mark)

- 11. What is a gland? (Easy)
- 12. What are exocrine glands? (Easy)
- 13. What is a hormone? (Easy)
- 14. What is the function of pituitary hormone? (Easy)
- 15. What is adolescence? (Easy)
- 16. What is the most important and common change that can be noticed in adolescents? (Average)
- 17. What is balanced diet? (Easy)
- 18. What is menopause? (Easy)

III Answer the following questions. (2 marks)

- 19. Mention the changes seen in adolescent boys . (Easy)
- 20. Mention the changes seen in adolescent girls. (Easy)
- 21. What is the reason for the appearance of 'Adam's apple' in the boys? (Average)
- 22. Name the hormones and sex glands that bring secondary sexual characteristics in the boys and the girls who have entered puberty. (Average)
- 23. How is the sex of a child determined? (Easy)
- 24. Mention any four measures that adolescents can follow to maintain their health well. (Easy)
- 25. How does menstruation occur? (Average)
- 26. How does AIDS spread? (Average)

IV. Answer the following questions. (3 marks)

- 27. 'Physical maturity is different from sexual maturity'. Justify this statement with suitable explanation. (Difficult)
- 28. a). Name the hormone that controls metamorphosis in the life cycle of insects and frogs. (Average)
- b) Name the element required for the production of this hormone. What is the effect of deficiency of this element in water on insects and frogs?
- 29. Mention the meaning of the following scientific terms: i) Embryo ii) Fertilization iii) Zygote (Average)
- 30. 'There is a need for personal counselors in schools where there are adolescent students'. Justify this statement. (Difficult)

10. Sound

Learning outcomes:

Students are able to

1. Determine that the sound is a form of energy with the help of day to day illustrations.
2. Mention the factors required for the production of sound.
3. Explain the process of propagation of sound.
4. Explain the mechanism of hearing sound through our ears.
5. List the properties of sound.
6. Make the difference between music and noise.
7. Identify the vibrating parts of musical instruments that produce sound.
8. Identify the reasons for noise pollution.
9. Recognize the effects of noise pollution.
10. Suggest the measures to control noise pollution.
11. Demonstrate activities to show that the sound requires material medium for the propagation.
12. Define : vibration, oscillatory motion, frequency, Hertz, amplitude, audible sound, inaudible sound.
13. Sketch sound wave.
14. Distinguish between high pitch sound and low pitch sound with examples.

Weightage:

Difficulty level	No. of questions	Marks	percentage
easy	11	15	28%
average	15	23	42%
difficult	6	16	30%
Total	32	54	100%

Distribution of marks based on difficulty level for different types of questions

objectives	Knowledge	Understanding	Application	Skill
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Multiple choice	2	4	4	-
VSA1(1M)	5	3	1	-
SA1(2M)	1	2	4	-
LA1(3M)	-	1	1	1
LA2(4M)	1	-	1	1
Total	9	10	11	2

I.Four alternatives are given for the following questions/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of the alphabet. (1 mark)

1. Sound can travel through (Easy)
 - A. Solids only
 - B. Liquids only
 - C. Gases only
 - D. Solids, liquids and gases
- 2 . Voice of minimum frequency is produced in (Average)
 - A. Baby girls
 - B. Baby boys
 - C. Women
 - D. Men
3. The frequency of audible sound for human ears is (Easy)
 - A. Less than 20 Hz
 - B. 20 Hz -20,000 Hz
 - C. More than 20,000 Hz
 - D. 10 Hz-100 Hz
4. sound cannot be travelled in (Average)
 - A. Vacuum
 - B. Solid
 - C. Liquid
 - D. Gas
5. Sound travels the fastest in (Easy)
 - A. Gases
 - B. Liquids
 - C. Solids
 - D. Vacuum
6. If the frequency of sound wave increased, then the (Average)
 - A. Pitch of the sound decreases
 - B. Wavelength also increases
 - C. Amplitude increases

- D. A high pitch sound produces
7. The unit that indicates the capacity of hearing of our ear is (Average)
- Hertz
 - Decibel
 - Metre
 - KiloHertz
8. A statement that is 'NOT CORRECT' with respect to the sound wave is, Sound (Difficult)
- has wave nature.
 - required a material medium for its travel.
 - is a longitudinal wave.
 - travels in vacuum.
9. The number of repeated oscillations in one second is known as (Average)
- Vibrations
 - Frequency
 - Amplitude
 - Reflection
10. A measure that can be followed to reduce noise pollution is (Average)
- Staying away from the urban areas
 - Constructing sound proof buildings
 - Growing more and more plants in our surroundings
 - Restricting frequent use of vehicles horns

II. Answer the following questions. (one mark)

- What is vibration? (Easy)
- What is frequency? (Average)
- Write any two illustrations that help to determine sound is a form of energy. (Average)
- Mention one difference between audible and inaudible sound? (Easy)
- When does the sound is considered as noise? (Easy)
- What happens to our ears if the audible sound is more than 80 decibels? (Easy)
- Name the SI unit of measuring frequency of sound waves. (Easy)
- What is an oscillation? (Easy)
- Define 'amplitude' of a sound wave. (Average)

III. Answer the following questions. (2 marks)

- What causes noise pollution? (Average)
- A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency. (Difficult)
- List the adverse effects of noise pollution. (Average)
- Suggest any two measures that can be followed to control noise pollution. (Average)
- Discuss how sound gives pleasure in our lives. (Easy)
- An astronaut cannot hear the voice of another astronaut in space but on the earth we can hear the varieties of sound. How? (Difficult)
- Write any two applications of ultrasound. (Average)

IV. Answer the following questions. (3 marks)

- Explain the mechanism of hearing sound through our ears. (Difficult)
- Explain an activity to show that the sound travels in liquids. (Average)
- List the differences between

- a) Noise and music.
- b) Infrasonic and ultrasonic sound
- c) High pitch and low pitch sound. (Average)

V. Answer the following questions .(4 marks)

30. Name any four musical instruments and mention their vibrating parts responsible for generating sound. (Easy)
31. Sketch the human ear and show the complete travelling pathway of sound waves.(Difficult)
32. Give scientific reasons for the following : (Difficult)
- a) The noise levels are higher on a humid day than on a dry day.
 - b) We hear the ticking of the clock more clearly at night than in day time
 - c) Each person's voice is unique
 - d) The thunder is heard after a few seconds when the lightning strikes.

11.Chemical Effects of Electric Current

Learning outcomes

Students ,

1. Classify the Objects used in daily life into electrical conductors and electrical insulators.
2. Interpret that the liquids allow electricity to flow through them.
3. Explain the reason for glowing of bulb .
4. Interpret the magnetic effects caused due to electric current.
5. Trace good and poor fluid conductors through practical activities.
6. List the chemical effects of electric current.
7. Explain the process of electroplating.
- 8.Mention the necessity and the uses of electroplating process.

Distribution of marks based on difficulty level for different types of questions

Questions	easy	average	difficult	total
MCQ	6	4	-	10
1M questions	6	4	-	10
2M questions	-	6	3	9
3M questions	-	5	1	6
4M questions	-	-	-	-
5M questions	-	-	-	-
total	12	19	4	35

Different types of question – an overview of the distribution of marks by objectives

Questions	memory	understanding	Application	skill	total
MCQ	3	6	1	-	10
1M questions	5	3	2	-	10
2M questions	-	6	3	-	9

3M questions	-	2	2	2	6
4M questions	-	-	-	--	-
5M questions	-	-	-		-
total	8	17	8	2	35

1. I. Choose the correct answer for the following incomplete statements/questions from the given four alternative options. Write the correct answer along with its letter of the alphabet. (1 mark)

- A material that allows electricity to pass through it among the following is (easy)
 - Aluminium
 - Rubber
 - Plastic
 - Dry wood
- A device that is used to test whether electricity flows through a particular object or not is (easy)
 - Bulb
 - Copper wire
 - Tester
 - Electric cell
- The phenomenon that is responsible for glowing of an electric bulb in an electrical circuit is, (average)
 - Chemical effect of current
 - Physical effect of current
 - Magnetic effect of current
 - Heating effect of current
- The apparatus shown in the given picture is (easy)
 - Electric bulb
 - Dry cell
 - Light emitting diode
 - Battery

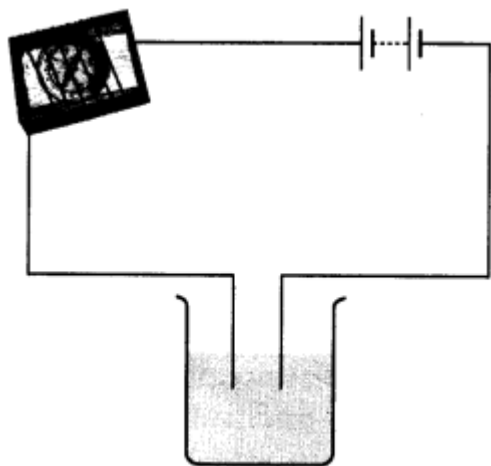


- A simple device that can be used to determine the amount of current flowing in a circuit is (average)
 - Bulb
 - Light emitting diode
 - Tester
 - Mobile charger
- A testing unit is used to test the electrical conductivity of two solutions marked A & B. The bulb glows more brightly in the solution marked A but it glows very dim in the solution marked B. The conclusion that can be drawn from this observation is (average)
 - solution A is better conductor than solution B
 - solution B is better conductor than solution A.

- C. the flow of electric charges is same in both the solutions
 - D. the amount of solute in the solution B may be higher.
7. A weak conductor of electricity among the following is (easy)
- A. Vinegar
 - B. Sugar solution
 - C. Lemon juice
 - D. Sulphuric acid
8. Among the following pair of liquids , an example for having only a pair of liquids that are good conductors electricity is, (easy))
- A. Lemon juice , vinegar
 - B. Carbonic acid , rain water
 - C. Soda water , distilled water
 - D. Copper sulphate solution , cooking oil
9. A solute that can be dissolved in distilled water to convert the distilled water into an electrolyte among the following solutes is (easy)
- A. Glucose
 - B. Sugar
 - C. Pure alcohol
 - D. Cooking salt
10. The electrical effect that allows the deposition of a layer of one metal on another metal is (average)
- A. Chemical effect
 - B. Heating effect
 - C. Magnetic effect
 - D. Possible by the effects of both A and B

II Answer the following questions. (1 mark)

- 11. What are electrical conductors ? (easy)
- 12. What are electrical insulators ? (easy)
- 13. State the common use of the tester shown in the given below figure (average)



- 14. What do we observe when a magnetic compass is brought close to a current carrying wire? (average)
- 15. What is the advantage of using LEDs? (average)
- 16. What are electrodes? (easy)
- 17. What is the chemical effect of electric current?. (easy)
- 18. Tap water conducts electricity through itself . How is this possible? (average)

19. Does electricity flow through distilled water or not? Give reason for your answer (easy)

20. What is electroplating ? (easy)

III Answer the following questions (2 marks)

21. Classify copper, glass, charcoal and iron materials into conductors and insulators of current .(average)

22. How does a bulb give light ? Explain . (average)

23. When a fire breaks out, firefighters turn off the main supply of electricity before using water to extinguish the fire . Mention appropriate reasons for this. (difficult)

24. When drinking water and seawater are tested through a testing unit , the deflection of the magnetic needle placed in the tester is more noticeable in seawater . What is your justification for this observation? Explain. (difficult)

25. Is it appropriate for an electrician to do electrical repairs outside during heavy rain? Explain. (average)

26. Rain water is collected and when current is passed through it by placing a tester having a magnetic needle in it. Then deflection will be observed in the magnetic needle . Why ? Explain. (difficult)

27. List the electroplated objects that are found around you. (average)

28. Tin cans used to store food items are made by coating tin on iron . Why? Give reason (average)

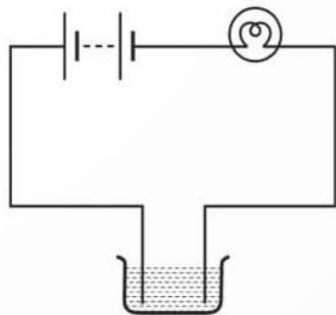
29. A thin layer of zinc is coated on the iron objects used in bridges and automobiles. What are the reasons for this measure?. (average)

IV Answer the following questions . (3 marks)

30. Draw the diagram of that shows flow of electricity through water and label the following parts. (average)

i) Carbon plate. ii) Battery

31. Imagine that the bulb is not glowing in the tester shown in the given figure. What could be the reasons ? Clarify . (average)



32. State the various chemical effects observed when electricity is passed through an electrolytic solution . (average)

33. Draw the diagram to show electroplating and label the following parts. (average) i) Copper strip
ii) Copper sulphate solution

34. In the process of obtaining pure copper from impure copper , to which electrode should the impure copper be connected? Support your conclusion. (difficult)

35. Chromium is used to coat handles of bicycles, wheel rims and many other items. Why ? Give reason. (average)

12. SOME NATURAL PHENOMENA

Learning outcomes

Students are able to ,

1. Explain the causes for lightning and its effects.
2. Identify and name the types of charges with the help of the activities.
3. List the measures that have to be followed during lightning.
4. Explain the reasons for causing earthquakes and its effects.
5. Name the seismic zones in India
6. List the measures that have to be followed during an earthquake.
7. Define the meaning of lightning conductor and explain the working of it.
8. Explain the concept and the meaning of natural disasters along with certain examples.
9. Give reasons to call some natural phenomena as disasters.
10. State the laws of charges.
11. Conduct experiments to narrate like charges repel each other and unlike charges attract each other.
12. Draw the diagram showing the structure of the earth.
13. Name different layers of the earth.

Weightage to different types of objectives

Questions	K	U	A	S	Total
M. C. Q	6				6
1 Mark	3	2			5
2 Marks	1	3	3		7
3 Marks		4		2	6
4 Marks		1			1
5 Marks			2		2
Total	10	10	5	2	27

Weightage to different difficulty levels

Types	easy	average	difficulty	Total
MCQ	6			6
VSA	2	3		5
SA 2M	1	3	3	7
LA 3M		4	2	6
LA 4M		1		1
LA 5M			2	2
Total	9	11	7	27

I. Choose the correct answer for the following incomplete statements/questions and write the correct answer along with its letter of alphabet. (1 Mark)

- The sound is heard during lightning is (Easy)
 - Thunder
 - Crackling
 - Noise of wind
 - Sound of rain
- Among the following a kind of attraction can be seen between (Easy)
 - Negatively charged particles
 - Charged refills
 - Charged balloon and charged refill
 - Uncharged particles
- One of the following activities is not to be performed at the time of lightning (Easy)
 - Bathing
 - Using mobile phone
 - Lightning of the bulbs
 - Not going out of the house
- A natural phenomena that occurs due the disturbance deep inside the earth's crust is (Easy)
 - Lightning
 - Cyclones
 - Earthquake
 - Thunderstorm
- The instrument used to detect the shakes that happen deep inside the earth is (Easy)
 - Thermometer
 - Seismograph
 - Barometer
 - Hygrometer

6. The materials used to build buildings in seismic zones are (Easy)

- A. Brick and rock
- B. Sand and stone
- C. Cement and Iron
- D. Mud and wood

II. Answer the following questions (1 Mark)

- 7. What causes lightning ? (Easy)
- 8. Name the device used to protect tall buildings from lightning . (Easy)
- 9. List any two safety measures to be followed if we are outside of the house during lightning. (Average)
- 10. Name the destructive natural phenomena that cannot be predicted in advance (Average)
- 11. Name the instrument used to measure the intensity of the earthquakes . (Average)

III. Answer the following questions. (2 Marks)

- 12. A charged body loses its charge when it is being touched by our hand. Why? Explain . (Average)
- 13. How does electric discharge occur in clouds? (Difficult)
- 14. It is safe to use mobile phones instead of landlines during lightning. Why? (Difficult)
- 15. Earthquakes are sometimes considered as disasters. Justify this statement.. (Easy)
- 16. What are fault zones? (Average)
- 17. What precautionary measures have to be followed during the time of an earthquake when we are out of the house? (Difficult)
- 18. What is a lightning conductor? How does it work? (Average)

IV. Answer the following questions (3 marks)

- 19. What happens when a charged straw is brought closer to another uncharged straw? Explain. (Average)
- 20. How does lightning occur? Explain. (Average)
- 21. How do earthquakes occur? Explain. (Average)
- 22. Draw the diagram to show the structure of the earth and its three layers. (Difficult)
- 23. If air and clouds both are good conductors of electricity, then does lightning could occur? Analyse . (Difficult)
- 24. What precautions are to be followed while constructing buildings at the zones where earthquakes occur frequently? (Average)

V. Answer the following questions: (4 Marks)

- 25. Explain about the measures that should be followed at the time of lightning and earthquake? (Average)

VI. Answer the following questions: (5 Marks)

- 26. How can materials be charged? Explain the mutual interaction between like charges and unlike charges with the help of an illustration. (Difficult)
- 27. What are natural disasters? Name four natural phenomena that can be considered as disasters. Write three reasons for deciding the given examples by you as disasters. (Difficult)

13.Light

Learning outcomes

Students are able to

1. Explain how objects appear.
2. Define the laws of reflection of light.
3. Relate the angle of incidence to that of angle of reflection.
4. Draw the ray diagram to show reflection of light from a plane mirror.
5. Explain the experiment on reflection of light.
6. Differentiate regular and diffused reflection.
7. conduct an activity to show the reflection of reflected light
- 8 Conduct an experiment to obtain multiple reflections.
9. Explain the principle of construction and uses of periscopes and kaleidoscopes.
10. Explain the structure and function of the human eye and care taking of the eyes.
11. Appreciate the Braille system that helps visually impaired people.
12. Analyse how visual and non-visual aids are helpful to overcome visual limitations.

WEIGHTAGE TO DIFFICULTY LEVEL

TYPES	EASY	AVERAGE	DIFFICULT	total
MCQ	6	8	1	15
VSA	7	9	2	18
SA(2m)	8	6	2	16
LA(3m)	1	2	2	5
LA(4m)	1	1	4	6
LA(5m)	-	-	-	-
TOTAL	23	26	11	60

WEIGHTAGE TO OBJECTIVES

QUESTIONS	REMEMBERANCE	UNDERSTANDING	APPLICATION	SKILL	TOTAL
MCQ	7	6	2		15
1 MARK	6	9	3	-	18
2 MARKS	5	9	1	1	16
3 MARKS	1	2	1	1	5
4 MARKS	-	2	3	1	6

5 MARKS	-	-	-	-	-
	19	28	10	3	60
	32%	44%	15%	9%	100%

I. Choose the correct option for the following incomplete statements/questions and write the answers along with its letter of alphabets (1 mark)

1. The change that takes place in a light ray when it incidents on a mirror is,its **(Average)**

- A. speed
- B. direction
- C. both speed and light
- D. colour

2. The light ray,that strikes any surface, is called **(Easy)**

- A. incident ray
- B. reflected ray
- C. emergent ray
- D. refracted ray

3.The ray that comes back from the surface after reflection is known as **(Easy)**

- A. incident ray
- B. reflected ray
- C. normal
- D. refracted ray

4. The angle between the normal and incident ray is the angle of **(Easy)**

- A. incidence ($\angle i$)
- B. reflection ($\angle r$)
- C. devation
- D. refraction

5.Sunlight is a **(Easy)**

- A. yellow light
- B. combination of seven colours
- C. red light
- D. black light

6. The part of an eye where the Pupil located is . **(Average)**

- A. cornea
- B. lens
- C. iris
- D. retina

7. Pupil is a **(Easy)**

- A. small hole
- B. lens
- C. colour pigment
- D. nerve cell

8. Rods are sensitive to **(Average)**

- A. dim light
- B. bright light
- C. red light
- D. blue light

9. The lens focuses received light rays on **(Average)**

- A. cornea
- B. lens
- C. Iris
- D. retina

10. The cells of the eye that are sensitive to bright light are **(Average)**

- A. cones
- B. rods
- C. both cones and rods
- D. nerve cells

11. The cells of the eye that are sensitive to colours are **(Average)**

- A. cones
- B. rods
- C. both rods and cones
- D. Iris

12. The part of a eye that consists of vision receptor cells is **(Difficult)**

- A. cornea
- B. lens
- C. blind spot
- D. retina

13. The impression of an image persists on retina for about **(Average)**

- A. $\frac{1}{9}$ th of a second
- B. $\frac{1}{16}$ th of a second
- C. $\frac{1}{19}$ th of a second
- D. 1 second

14. The number of still pictures that move before our eyes every second when watching a movie are **(Average)**

- A. 24
- B. 16
- C. 9
- D. 18

15. If dust particles enter into our eyes then correct measure that would be following is

(Easy)

- A. rub the eyes to pushout them
- B. washing our eyes with clean water
- C. consulting a doctor immediately
- D. applying the eye drops to the eyes

II. Answer the following questions (1 mark)

16. Why can't we see the objects on the other side of wooden wall ? **(Average)**

17. If an angle between an incident ray and a reflected ray is 100° then find the angle of incidence

(Average)

18. What is mirror? **(Average)**

19. Define lateral inversion **(Average)**

20. Name two types of reflections. **(Easy)**

21. Which type of reflection takes place on rough surface ? Why? **(Easy)**

22. Which type of reflection takes place on smooth surface? Why? **(Easy)**

23. Though the moon is not a self luminous object, how does it appear to us? **(Average)**

24. If the light incidents on the plane mirror at an angle of 40° , then the reflected angle is also 40° . Why?

(Easy)

25. What is kaleidoscope? Mention one use of it. **(Difficult)**

26. Write one of the uses of periscope. **(Average)**

27. What is the least distance at which a person can read clearly with a normal eye? **(Average)**

28. Which vitamin deficiency causes night blindness ? **(Easy)**

29. On which part of the retina an image does not form? Why? **(Difficult)**

30. What causes the distinct color of the eyes? **(Average)**

31. What is the function of pupil? **(Average)**

32. What is retina? **(Easy)**

33. How does Visually impaired person read ? **(Easy)**

III. Answer the following questions (2 marks)

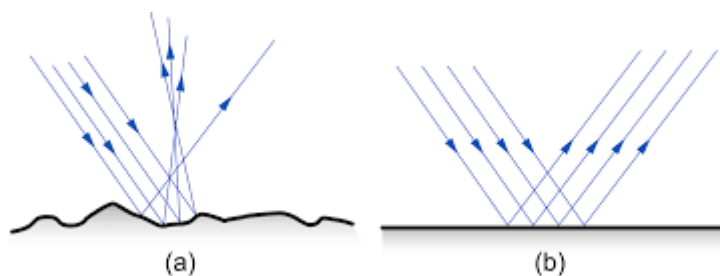
34. Can we see the objects in a dark room? Justify your answer? **(Average)**

35. Light is a form of energy. How? Explain . **(Easy)**

36. How can we see the objects of our surroundings ? Explain. **(Easy)**

37. State the laws of reflection . **(Average)**

38. Identify the type of reflections shown in the following figures. Give an example to each . **(Easy)**

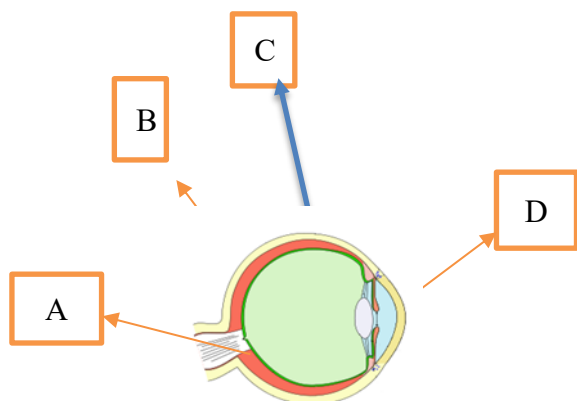


39. List any four foods that are rich in vitamin A . **(Easy)**
40. What are self luminous objects? Give two examples. (**Average**)
41. Write the figures to show regular and diffused reflections of light . **(Easy)**
42. Explain the function of retina .(**Average**)
43. Mention the type of reflection takes place when a beam of light strikes the following materials. **(Easy)**
- (a) mirror.
 - (b) scratched steel plate
 - (c) rough wall
 - (d) Marble floor with some water spread over it.
44. Fastly moving fan blades appear blurred. Explain the reason for this. (**Difficult**)

45. How do the light rays reflect when they incident on the surface of wall and a mirror?

(Average)

46. Name the parts of eyes in the boxes given **(Easy)**



47. Usually eye specialists suggest to consume papaya and green vegetables (spinach) more to maintain health conditions of eyes. Why? **(Easy)**

48. If the book is brought too closer to the eyes ,it is not possible to read. Why? **(Difficult)**

49. The vision of an old man is foggy. Mention the reason and remedy for this problem.

(Average)

IV. Answer the following questions (3 marks)

50. Does irregular reflection obey the laws of reflection or not? Support your answer with suitable explanation. (**Average**)

51. List the properties of image formed by a plane mirror? **(Easy)**

52. Owls have clear vision during night time but do not have clear vision during day like other animals. Clarify the reason. **(Difficult)**

53. Observe the below depicted picture. Write a short note on the reflection of light with the help of this picture. (**Average**)



54. How do optical aids help to overcome visual limitations? **(Difficult)**

V. **Answer the following questions (4 marks)**

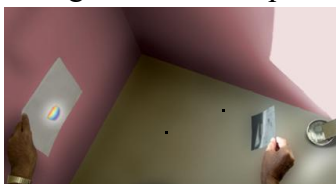
55. How does a kaleidoscope work? Explain. **(Difficult)**

56. Narrate an activity related to below given figure. **(Average)**



57. (a) What is dispersion of light? Name a natural phenomenon that occurs as a result of dispersion of light .

(b) Explain the dispersion of light with the help of the given below figure . **(Difficult)**



58. List out any four precautionary measures that are followed to protect our eyes. **(Easy)**

59. Draw the diagram to show the structure of human eye and label the following parts. **(Difficult)**

i) Ciliary muscles ii) Lens

60. How does the image of an object form in our eyes? **(Difficult)**

Answers

1.Crop production and management

I.

1. B) preparation of soil
2. D) Drip irrigation
3. D). The same kind of plant on a large scale at one place
4. B) Plough, hoe, cultivator
5. B) Earthworm
6. C) hoe
7. A) crop-rotation
8. D) lead to environmental pollution
9. C) nitrogen
10. A) coffee plantation

II

11. Rabi crops are grown in winter season and kharif crops grown in rainy season .
12. Healthy seeds are more dense and will float, while damaged seeds will float when put them in water.
13. Irrigation is a artificial application of water to the soil through various systems of tubes, pumps etc.
- 14.Examples for weedcides: 2,4-D, Ehtyle ester, Neem extract
15. combine equipment is used to harvest,threshes, and cleans crops in a single operation.
16. Chemical fertilizers: urea, potash and ammonium sulfate
- 17.The bacteria present in root nodules of leguminous plants is Rhizobium.
18. water the process of cutting and gathering mature crops from the field.
19. Animal husbandry is the branch of agriculture concerned with animals that raised for meat, fibre,milk.
20. The instrument used for effective sowing of seeds in the fields is Seed drill.

III.

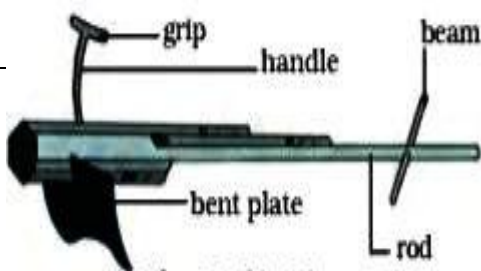
21.

The process of loosening and turning of the soil is called ploughing.

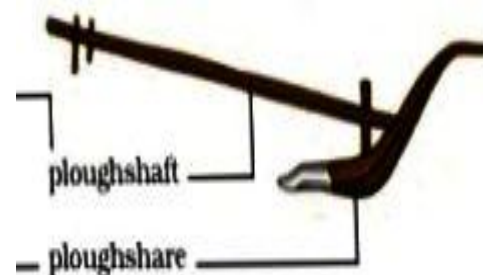
Advantages :

- loosens the soil, improves aeration
- enhances water retention, and helps to control weeds.

22.



hoe
diagram



plough
shaft

- 23.
- seeds should be clean, free from weeds , healthy, and free from diseases,
 - have high germination capacity.
- 24.
- Seed drill is a device used to sow the seeds in agriculture.
- Importance: it sows the seeds equally at the right distances and depths.
- 25.
- Compost manure is made by collecting waste materials like dry leaves, vegetable peels, cow dung, etc., and allowing them to rot in a pit for a few weeks. During the process of decomposing , microorganisms break down the waste and turn it into manure.
- Two advantages of compost manure are
1. It increases soil fertility.
 2. It is cheap and eco-friendly.
- 26.
- The techniques used to store harvested grains are,
- Drying the grains well before storage.
 - Storing grains in jute bags or metal bins.
 - Using neem leaves or chemicals to protect from insects.
 - Keeping grains in godowns or silos.
- 27.
- The following methods are used to remove the weeds
- Manual weeding – removing weeds by hand.
 - Using tools like hoe or khurpi.
 - Spraying weedicides like 2,4-D.
 - Crop rotation to reduce weed growth.
- 28.
1. Animals like cows and buffaloes give dung, which is used as manure.
 2. Farmers earn money by selling milk, eggs, or meat, which helps them in farming.
- 29.
- Drip irrigation gives water drop by drop to the roots of plants. It saves water and gives water directly where it is needed. This helps crops grow better with less water.
- 30.
1. Preparation of soil
 2. Adding manure and fertilizer
 3. Sowing
 4. Irrigation
 5. Protection from weeds
 6. Harvesting
 7. Storage
- 31.
- Rabi crops are grown in the winter season and harvested in summer.
- Examples: Wheat and Mustard.

32.

Kharif crops (grown in rainy season):

- Soyabean
- Groundnut
- Paddy
- Cotton
- Maize
- Ragi

Rabi crops (grown in winter season):

- Wheat
- Mustard
- Gram
- Linseed

33.

1. Loosens the soil for better root growth.
2. Helps air and water reach the roots.
3. Removes weeds and harmful organisms.
4. Mixes manure and fertilizers well in the soil.

34.

a. Leveller:- Instrument used in agriculture , to smooth and level soil before sowing, irrigating, or other farming operations.

b. Sickle:

Used to cut crops during harvesting.

c. Cultivator:

Used to loosen the soil and mix fertilizers before sowing.

35

- Seed drill plants seeds at the right depth and distance.
- Saves seeds and gives better growth.
- Broadcasting spreads seeds unevenly, leading to overcrowding.

36.

Manure	Fertilizer
Made from natural waste (like dung)	Made from chemicals in factories
Improves soil health slowly	Gives fast nutrients to plants

37.

- Too much fertilizer can damage soil and plants.
- Only manure may not give enough nutrients.
- Using both in the right amount gives better yield and protects the soil.

38.

No, 'X' is wrong. 'Y' student is right , because Pesticides sprayed on fruits are harmful to humans. Eating unwashed grapes can cause health problems. Fruits should be washed before eating.

39.

Answer:

- Crops can get spoiled by moisture.
- Fungi and insects may grow.
- Stored grains may rot and become useless.
- It causes loss of food and money.

So the crops must be dried before storing .

40.

i .

Cup C shows the least growth of seeds because neither manure nor fertilizer is added. Without nutrients, the seeds do not grow well.

ii.

Cup B shows the highest growth of seeds because fertilizer is added. Fertilizers provide essential nutrients that help seeds grow faster and healthier.

41.

(a) Moat (Pulley system)

(b) Rahat (lever system)

(c) Dhekli

(d). Chain pump

42.

Continuous cultivation of the same crop in the same field should be avoided because:

- It reduces soil fertility as the same type of nutrients are continuously used.
- It increases the chances of pests and diseases specific to that crop.
- It leads to poor yield over time.

Disadvantages of over supply of water to the agricultural fields:

1. Waterlogging: Excess water blocks air spaces in the soil, leading to poor root growth.
2. Root rot: Plants may suffer from fungal diseases and decay due to excess moisture.
3. Leaching of nutrients: Extra water washes away essential nutrients from the soil.
4. Wastage of water: Leads to inefficient use of a valuable resource.

43.

Answer:

Strategies to Maintain Soil Fertility in Agricultural Fields:

1. Crop Rotation: Growing different types of crops in succession helps prevent nutrient depletion and controls pests.
 2. Use of Organic Manure: Adding compost, cow dung, or green manure enriches the soil with essential nutrients.
 3. Mixed Cropping: Growing two or more crops together improves nutrient use and supports soil health.
 4. Minimum Use of Chemical Fertilizers: Excessive use harms soil microbes; balanced use keeps soil fertile.
 5. Planting Leguminous Crops: These crops (like beans and peas) fix nitrogen in the soil naturally.
 6. Avoiding Over-Irrigation: Prevents waterlogging and nutrient loss.
 7. Mulching: Covering soil with straw or leaves prevents erosion and adds organic matter.
 8. Contour Ploughing and Terracing: Prevents soil erosion on slopes and retains fertility.
- These methods ensure long-term productivity and sustainability of agricultural fields.

44. Answer

Crop rotation	Inter cropping
Growing different crops in the same field in different seasons.	Growing two or more different crops at the same time in the same field.
To restore soil nutrients and reduce pests/diseases.	To make better use of space, light, water, and nutrients.
One crop is grown after another over time	Multiple crops are grown at the same time.

45. HOTS

Answer:

Solutions for a Farmer Facing Water Scarcity During Fruit Cultivation:

1. Drip Irrigation System:
 - Water is delivered directly to the roots of each plant through small pipes.

Effects:

- Saves water (up to 50–70% less than traditional methods).
- Reduces weed growth.
- Increases yield and fruit quality.

2. Mulching:

- Covering the soil around plants with dry leaves, straw, or plastic sheets.

Effects:

- Reduces water evaporation from soil.
- Keeps soil temperature stable.
- Prevents weed growth.

3. Rainwater Harvesting:

- Collecting and storing rainwater for later use in farming.

Effects:

- Provides water during dry periods.
- Reduces dependence on groundwater.
- Helps recharge the water table.

4. Use of Drought-Resistant Fruit Varieties:

- Planting varieties that require less water (e.g., pomegranate, custard apple).

Effects:

- Reduces water requirement.
- Ensures better survival during dry spells.

5. Scheduling Irrigation Wisely:

- Watering during early morning or late evening to reduce evaporation.

Effects:

- Minimizes water loss.
- Improves water-use efficiency.

Conclusion:

By adopting these methods, the farmer can conserve water, ensure better growth of fruits, and maintain good yields even during water scarcity.

2.MICRO ORGANISMS FRIEND AND FOE

KEY ANSWERS

- 1.B. Alcohol
- 2.A. anaphilis female mosquito
- 3.C. fly
- 4.C. growth of yeast cells
- 5.C. fermentation
6. B. streptomycin
- 7.B. ovaries
- 8.A. vinegar
- 9.D. cold storage
- 10.A. rhizobium

II.

- 11.The organisms which are not visible through our naked eyes and can be seen through microscope are called micro organisms.
- 12.Microorganisms usually live in atmospheric air ,water ,in moisture and also in the body of living organisms.
- 13.Types of microorganisms are
 - 1.Bacteria
 - 2.Fungi
 - 3.Algae
 - 4.Protozoa
14. Lactobacillus bacteria
- 15.Edward jenner
- 16.Nitrosomonas, nitrobacter,azatobacter and rhizobium are nitrogen fixing organisms.
- 17.Bacillus anthrosis bacteria
- 18.Milk is boiled at 70*c for about 15 to 30 minutes and cooled to kill harmful bacteria and microbes. This process is called as pasteurization.

III.

- 19.Viruses are very smaller in size thanother microbes,they live inside the body of living organisms and reproduce in their bodies.They also causes harmful diseases in humans.
- 20.Antibiotics are the substances which are helpful in killing the harmful microorgnisms that cause diseases in human beings and animals.
- 21.Vaccines gives us protection against the infection of micro organisms .They avoid the spread or infection of micro organisms into human body.So these gives us protection from harmful microbes. Edward Jenner was known as the father of vaccination.
- 22.Microorganisms cleans our environment by decaying the dead bodies of plants and animals and also decompose the organic nutrients present in the dead plants and animals. By this way they cleans our environment.
- 23.Antibiotics are different from vaccines because antibiotics are taken after the infection of microorganisms but vaccines are taken to prevent the infection of microorganisms from causing diseases.



24.

Chlamidomonas

paramecium

25. i) Bacteriophage-----Viruses
 ii) Aspergillus-----Fungi
 iii) Amoeba-----Protozoa
 iv) Volvox-----Algae

IV.

26. The diseases which are spread from one person to another through infection are called communicable diseases.

Through water ----Typhoid ,dysentery.

Through air-----Tuberculosis,common cold.

27. We should cover our nose and mouth while coughing and sneezing because when cough or sneeze, thousands of microbes enter the air and easily spread and infect healthy persons through respiration and cause diseases.

28. Food poisoning is a condition that means contaminated food causes discomfort in stomach by the infection of microorganisms.

Symptoms are discomfort in stomach , pain in abdomen ,vomiting and dysentery.

V.

29. FOOD CONSERVATION METHODS ARE :

A. Pasteurisation –This method is used to kill microbes present in milk and keep it safe.

B. Chemical method—certain chemicals like ethylene is used to keep fruits healthy.

C. Salt addition—for foods like pickles and meat and fish salt is added to preserve them in good condition.

D. Drying—cereals and pulses are dried in sunlight to remove the moisture condition present in them.

3. Coal and petroleum.

I

- 1) D) Plastic
- 2) C) Solar light
- 3) D) Uranium
- 4) B) Carbonization
- 5) A) Carbon di oxide
- 6) A) Coal
- 7) B) Coke
- 8) C) Coal tar
- 9) B) naphthalene
- 10) D) surface coating of roads
- 11) B) escape oxidation of dead sea organisms under the sea bed
- 12) A) refining
- 13) A) Petrol
- 14) C) petroleum
- 15) C) does not contribute to air pollution

II.

- 16) Solar light and air
- 17) Inexhaustible natural resources : Sunlight, air
Exhaustible natural resources ; Forests,wildlife,minerals,coal,petroleum,natural gas etc
- 18) These were formed from the dead remains of living organisms(fossils). So, these are all known as fossil fuels.
- 19) Coal
- 20) Coke,coal tar, coal gas.
- 21) Coke
- 22) Separation of different petroleum products based on their boiling points.
- 23) Making of ointments,candles,Vaseline etc.
- 24) Liquefied petroleum gas
- 25) Hydrogen gas obtained from the natural gas.

III.

- 26) Inexhaustible natural resources : These resources are present in unlimited quantity in nature and are not likely to be exhausted by human activities Ex: sunlight, air
Exhaustible natural resources : The amount of these resources in nature is limited. they can be exhausted by human activities. Ex; forests, wildlife, minerals, coal, petroleum, natural gas etc.
- 27) The slow process of conversion of dead vegetation into coal.
- 28) 1. Fuel as cook

2. Railway engines and thermal power plants

29) Many useful substances are obtained from petroleum and natural gas these are termed as petrochemicals Ex: detergents, polythene, synthetic fibre,

30) This is good, because diesel is exhaustable resource and diesel vehicles make too much of environment pollution. but not electric vehicles

IV.

31) About 300 million years ago the earth had dense forests in low lying wetland areas. Due to natural processes, like flooding these forests got buried under the soil. As more soil deposited over them they were compressed, under the high temperature and pressure dead plants got slowly converted to coal. As coal contains mainly carbon.

32) Natural things : water, cotton, graphite

Man made things ∴ glass, nylon, polyester.

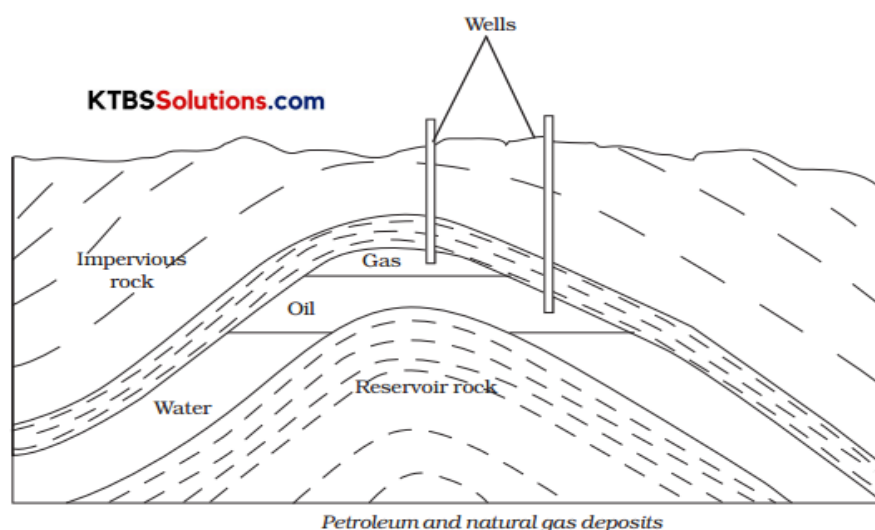
33) Fossil fuels in nature are limited they can be exhausted by heavy use, and by the using these fuels causes environment pollution.

34) * Coal gas is obtained during the processing of coal to get coke.

* It is used as a fuel in many industries situated near the coal processing plants.

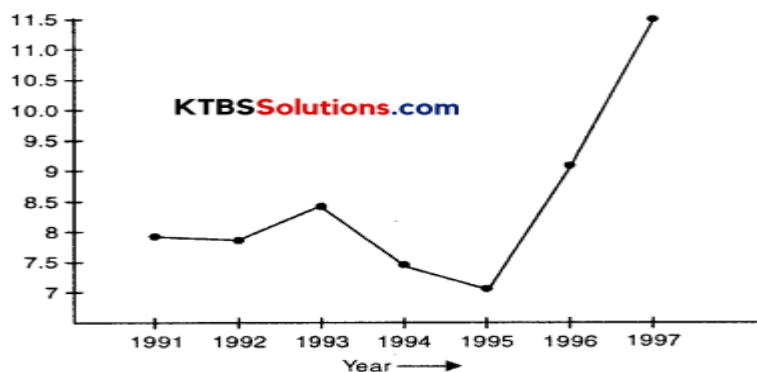
* Coal gas is used as source of heat.

35)



36) Petroleum was formed from organisms living in the sea. As these organisms died, their bodies settled at the bottom of the sea and got covered with layers of sand and clay. Over millions of years, absence of air with high temperature and pressure transformed the dead organisms into petroleum and natural gas.

37) .



4.Combustion and flame

I. Multiple choice questions.

1.D.coal

2.D. Liberates more carbon dioxide

3.A. an exothermic reaction

4.C. rapid combustion

5. C. carbon monoxide

6 .B.kJ/kg

7.C. liquid at high pressure

8.A. breaks the supply of oxygen and cools the fuel

9.C. outer most zone

10.C. hydrogen

11.B. methane

1mark questions.

12.phosphorus

13.coal

14. chemical process in which a substance reacts with oxygen to give off heat is called combustion.

15.water

16.LPG

17. The lowest temperature at which a substance catches fire is called its ignition temperature.

18. To cut off supply of air (oxygen)

2 mark questions

19. Explosion.

When a cracker is ignited, a sudden reaction takes place with the evolution of heat, light and sound.

20. Petrol

Petrol has low ignition temperature.

21. not correct

Water is heavier than oil so, it sinks below the oil and oil keeps burning on the top.

22. Substances like kerosene vaporize during burning and the vapours catch fire to form a flame, charcoal does not vaporize so it glows but not produce a flame.

23. Water conducts electricity and can cause electrical shocks if used on electrical fires.

24. Paper catches fire easily because it has low ignition temperature.

When a piece of paper is wrapped around an Aluminium pipe, the heat is conducted away by the aluminium which is good conductor of heat. This prevents paper from reaching its ignition temperature.

25. The factors essential for combustion are air, fuel and heat. (Any two)

The byproducts of complete combustion are carbon dioxide and water.

26. Fire extinguisher pours water on the fire, water cools the combustible material so its temperature brought below its ignition temperature and also helping in cutting of the supply of air.

27. The Soda acid fire extinguisher releases lot of dry powder of chemicals like Sodium bicarbonate or potassium bicarbonate near the fire, these chemicals give off carbon dioxide.

28. An ideal fuel is cheap

- Readily available
- Readily combustible
- Easy to transport
- It has high calorific value
- It does not produce gases or residues that pollute the environment. (any four)

29.

- Unburnt carbon particles in air are dangerous pollutants causing respiratory problems.
- Incomplete combustion of a fuel gives poisonous carbon monoxide gas.
- Increased percentage of carbon dioxide in air leads to global warming.
- Oxides of sulphur and nitrogen produced by the burning of coal diesel and petrol cause acid rain which is harmful for crops buildings and soil.

30. Goldsmith use the outermost zone of the flame because it is the hottest part and makes efficient and quick melting of metals like gold and silver.

31. Food undergoes chemical reaction with oxygen in our body releasing energy needed for various body functions. This is similar to combustion where a substance react with oxygen to release heat making food a biological fuel

32. Production of heat and light in the sun is not a combustion.

In the sun heat and light are produced by nuclear reactions.

33. Yes essential.

Wood have high ignition temperature and difficult to ignite directly.

Kerosene and paper have low ignition temperature, and burn easily providing the necessary heat to ignite.

34.

Inflamable The substances which have very low ignition temperature and can easily catch fire with flame are called inflammable Examples- petrol alcohol LPG CNG	Non flammable The substances which do not ignite it in air with a source of heat are called non flammable Examples- brick sand steel glass
---	--

35. Carbon dioxide is the best extinguisher, carbon dioxide is heavier than oxygen, covers the fire like a blanket, since the contact between the fuel and oxygen is cut off, the fire is controlled.

3marks questions.

36. Fix a burning candle on a table. Cover it with a glass chimney placed on wooden blocks to allow air in. The flame burns normally.

Remove the blocks so air cannot enter from below – the flame flickers and smokes. Cover the top with a glass plate – the flame goes out.

Conclusion: This shows that air (oxygen) is essential for combustion.

37. Solid fuel – wood, coal, charcoal.

Liquid fuel - kerosene, petrol, diesel ,

Gaseous fuel – LPG, CNG

38)

Rapid Combustion	Spontaneous Combustion
A substance burns rapidly and produces heat and light.	A substance bursts into flame without the application of any apparent cause.
Requires an external flame or spark.	Occurs without any external flame or spark.
Example: LPG ignited in a gas stove.	Example: Phosphorus burning in air at room temperature.

39)

- It has a higher calorific value (55,000 kJ/kg vs. 17,000–22,000 kJ/kg for wood).
- It burns cleanly without producing smoke or harmful gases like carbon monoxide.
- It is easier to store and transport, and ignites easily without the need for extra materials like kerosene or paper.(any two)

CNG

40. The three zones of a flame are:

- Innermost zone – Unburnt vapors (least hot)
- Middle zone – Partial combustion, luminous (moderately hot)
- Outermost zone – Complete combustion (hottest)

41)

* Calorific value is the amount of heat energy produced on complete combustion of 1 kg of a fuel is called its calorific value.

* The calorific value of 1 mole of butane is 2658kJ/mole.

* Hydrogen is not used as domestic fuel because of its high calorific value.

42. A matchstick does not catch fire on its own at room temperature because the temperature is not high enough to reach its ignition temperature. On striking the matchstick against the rough surface, friction generates enough heat to raise the temperature of the chemicals on the match head, initiating combustion.

Phosphorus suddenly burns in air into flames without the application of any apparent cause is called phosphorescence.

43.

* Rapid combustion- gas burns readily and produces heat and light

* Spontaneous - Phosphorus burns without the application of apparent cause

* Explosion- when a cracker is ignited, a sudden

8.FORCE AND PRESSURE

Key Answers

1. Newton / meter
2. Increases with depth
3. height of the liquid column
4. Both a and b
5. in all directions
6. The height of the water in the column
7. Force can change the position of an object
8. pushing a car
9. Statement A is correct and B is relevant to A
10. Push or pull
11. Frictional force
12. Wear and tear of shoe soles
13. Static friction, sliding friction, rolling friction
14. Marble floor, mat floor, sandy floor

II.

15. A manometer
16. Given volume The surface area of a sphere is the minimum this is the reason for the liquid draft to Aquarius spherical shape
17. The depth (or height) of the liquid column above the point, and the density of the liquid
18. Balloon attached to a tube (a) bulged more than balloon attached to the tube (b). This shows that the same height of milk exerts more pressure than alcohol.
19. Yes, both liquids and gases exert pressure
20. Submarines use strong, thick materials, especially steel, because they need to withstand immense water pressure at great depths.
21. Type of force

1. Contact force
2. Contact force
3. Non-contact force

4. Non-contact force.
5. Non-contact force
6. Contact force
7. Contact force
8. Contact force

III.

22. Repulsion is generally a push force, often due to the interaction of similar charges or like poles, while the force between two magnets is a specific type of push or pull force (magnetic force) stemming from the magnetic fields generated by the magnets.

23. A force is a push or pull acting upon an object that can cause it to accelerate (change its velocity), or to deform

24. Gravity:

This force pulls the ball downward, causing it to accelerate towards the ground.

Air resistance:

This force opposes the ball's motion and acts against the force of gravity.

25. Frictional force has two main advantages: it helps us walk by providing the necessary grip between our feet and the ground, and it enables us to write by allowing a pen or pencil to leave a mark on paper.

26. No, walking easily on wet ground is not possible because water reduces friction between your feet and the ground, making it easier to slip. Friction is essential for walking as it provides the resistance needed to maintain balance and move forward.

IV .

27.

- a) Camels can walk easily on sand because their broad feet reduce the pressure exerted on the sand
- b) Sailors who swim in deep sea wear special clothes, often called diving suits, to protect themselves from the immense pressure at depth. The pressure increases dramatically with depth, and these suits are designed to withstand that pressure and allow divers to remain comfortable and safe. Additionally, they help with thermal regulation in cold water and protect against marine life.

Elaboration

Pressure:

As divers descend into deeper waters, the weight of the water above them creates immense pressure. This pressure can be harmful to the human body, causing injuries and potentially death.

Diving Suits:

Diving suits are engineered to withstand this high pressure. They are typically made from strong, flexible materials that can distribute pressure evenly over the body.

Thermal Regulation:

Deep sea waters are often very cold. Diving suits provide insulation to help divers maintain their body temperature.

Protection:

Some diving suits also offer protection from sharp objects or marine life.

Breathing:

Diving suits are designed to allow divers to breathe while underwater, either through an air supply or by using a regulator that allows them to breathe normally in the water.

27.. C.Lizards can move on walls without falling because of the millions of tiny, brush-like structures called setae on their feet.

28..a.Due to the very small area of the cutting edge of a sharp knife even a small force will create a very high pressure.

V .

29.a.The force between the Sun and the planets in the solar system is gravitational force, which is a fundamental force of nature. This force of attraction keeps the planets in orbit around the Sun.

29.b.1. contact force

2 contact less force

30

- a) When Kitty spreads oil on the ground, Rani finds it easier to push the box because the oil reduces friction.
- b) Using rollers, waxing surface, pulling straps, smooth surface etc.

31.Friction, the force opposing motion, is both a blessing and a curse. While it's essential for many everyday activities like walking and holding objects, it also causes wear and tear, reduces efficiency, and wastes energy. A perfect example is the human foot: friction between the soles of our shoes and the ground allows us to walk and maintain balance, but it also leads to the gradual wear and tear of the shoe soles.

9.Friction

I. MCQ

- 1 . D. Both B and C
- 2 B. Rolling friction
3. C. Both A and B
4. A. Oil
5. D. Parking of a vehicle on a platform
6. C. is a force that opposes relative motion of the objects in contact.
- 7 . B. overcome the friction of the air.
- 8 . A. A rock or stone
9. C. Drag
10. D. Mirrors
11. B. decreases
12. D. Volume
13. A. increase the efficiency of the game.

II. One mark questions answers

14. Friction depends on factors like.. Nature of the surface of the object, force between them, nature of the objects etc.
15. Friction is the resistance offered by the surfaces in contact when they move past each other

16. Wheels of vehicles are made circular to minimize friction and make rolling motion easier.
17. The direction of friction force is always opposite to the direction of the object's motion.
18. Rolling friction is less than sliding friction. The friction force is in the opposite direction of the motion of the objects. We can easily drag the luggage by attaching small wheels to the joints and other parts of the luggage. Because rolling reduces the friction.
19. Frictional force helps us when walking. Walking on a smooth surface is difficult due to the lack of friction.
20. Objects moving on different surfaces are given specific shapes, particularly streamlined shapes, to minimize resistance and friction as they move through a fluid medium (like air or water). This is because the shape of an object significantly impacts the amount of fluid friction or drag it experiences.
21. Abrasive oils are specially formulated liquids that suspend abrasive particles, often used in processes like lapping and honing. They help to distribute the abrasives evenly, reduce friction, prevent overheating, and achieve smooth, consistent material removal and fine finishes.

III. Two mark questions answers

22. Players wear spiked shoes because the spikes increase the friction between the shoes and the ground, giving them more grip while running.
23. Examples of heat generation due to friction
When two hands are rubbed together, when a mixer jar is moved, when machine parts move.
24. Sliding friction:- Friction occurs due to the mutual contact of irregularities on two surfaces
Example: Pushing a heavy box on the floor. You need to apply a certain amount of force to overcome the static friction and get the box moving. Until that force is reached, the box remains stationary.
Static friction:- Friction that occurs when a body at rest starts to move at that moment.
Example: Once the box is moving, the friction you experience is sliding friction. It opposes the box's motion and tries to slow it down. Another example is a sled sliding down a hill
A spring balance is used to find the weight or applied force on objects.
25. Ball bearings are used to reduce friction in rotating or sliding parts of machinery and are found in a wide range of applications, from everyday objects to complex industrial equipment. They work by replacing sliding friction with rolling friction, using small steel balls to allow for smooth, low-friction rotation between two parts.

IV. Three mark questions answers

26. Friction can be used To move easily, to bind two objects, to keep objects from moving, to control the speed of movement of objects, The friction between our feet and the ground helps us to walk, to stand on the ground, to stand still, When we write using a pen, the friction between the tip and the paper is the reason. When a matchstick is scratched on a matchbox, it ignites due to friction. Friction helps to move heavy objects easily from one place to another, to increase the efficiency of machineries. These are few examples of friction being a boon to us. Examples of friction being an curse, Friction can cause things like screws, ball bearings, or shoe soles to wear out. The excess of

heat generated when a machine is running leads to energy loss. Friction can also produce heat, which can damage machines.

5.Conservation of Plants and Animals

Answers

1. B – An area where animals are protected from disturbance
2. D – Reforestation
3. B – Conserve natural forests and meet the needs of people
4. A – Protect and maintain the population of tigers in the country
5. A – Overgrazing of grass by cattle.
6. D – Both A and B
7. C – Kashmiri stag

II. Answer the following questions (1 Mark each)

8. Deforestation is the cutting down or clearing of trees and forests.
9. Ranganathittu and Kokkrellur are famous bird sanctuaries in Karnataka.
10. Flora refers to all the plants in an area, while fauna refers to all
11. Flora refers to all the plants in an area, while fauna refers to all the animals.
12. Two root causes for drought are deforestation and less rainfall.
13. A Red Data Book is a record of all endangered and extinct species.
14. An ecosystem is a community of living things interacting with each other and with their environment.
15. Reserved biospheres are protected areas that aim to conserve biodiversity and allow limited human activity.

III. Answer the following Questions (2 Marks each)

16. Wildlife sanctuaries protect animals in their natural habitat. National parks protect both animals and plants and are more strictly protected.
17. Extinct species are species that no longer exist. Examples: Dodo, Dinosaurs.
18. Endangered species are animals or plants that are in danger of becoming extinct. Examples: Tiger, Asiatic Lion.
19. Endemic species are species found only in one particular area. Examples: Lion-tailed macaque, Nilgiri Tahr.
20. Deforestation reduces moisture in the air and leads to less rainfall because there are fewer trees to release water vapor.
21. Without trees, soil becomes loose and easily washed away by rain, leading to soil erosion.

22. Reforestation helps grow new trees, which gives shelter to animals and helps plants grow, conserving flora and fauna.

23. Yes, in urban areas there are fewer trees and more construction, which increases soil erosion compared to rural areas.

24. The goals of Project Tiger are to protect tigers, increase their numbers, and conserve their forest habitats.

25. People near forests cut trees for firewood and farming, which leads to deforestation.

IV. Answer the following Questions (3 Marks each)

26. If one species goes extinct, it affects the food chain. For example, if tigers die, the deer population may grow too much and damage the forest.

27. Deforestation destroys homes of wild animals. It leads to loss of shelter, less food, and death of animals.

28. Wildlife can be conserved by:

Creating protected areas like national parks

Banning hunting

Planting trees

Spreading awareness among people

V. Answer the following (4 Marks each)

29. Four effects of deforestation:

Use less paper

Control logging

Educate people

30. If both plants (flora) and animals (fauna) are disturbed, the ecosystem balance breaks. Plants give food and shelter to animals. Without them, animals die, and without animals, pollination and seed spreading reduce.

31. Individuals can:

Plant trees in gardens and public places

Avoid using plastic and save paper

Spread awareness about saving animals

Report illegal hunting

VI. Answer the following Questions (5 Marks each)

32. Biodiversity means the variety of life – plants, animals, and microbes. It is important for food, medicine, clean air, and a balanced ecosystem.

Two threats:

Deforestation

Pollution

Measures:

Protect natural habitats

Reforestation and stricter laws.

33. Project Tiger was started to save tigers. In Karnataka, places like Bandipur and Nagarhole are protected areas. The project helped increase the number of tigers and save their forests.

34. Human activities like cutting trees, hunting, and pollution affect animals badly.

Three conservation measures:

Create protected areas

Ban hunting

Educate people about wildlife

35. Endangered species are important to keep the ecosystem healthy. Example: Tiger.
If tigers go extinct, it affects the whole food chain.
Two strategies:
Set up breeding centers

6.REPRODUCTION IN ANIMALS

I.

1. B. TESTES
2. C. HEREDITY
3. B. METAMORPHOSIS
4. B. TWO PAIR
5. B. FERTILIZATION
6. A. INSIDE THE FEMALE BODY
7. D. BUDDING
8. C. ZYGOTE
9. B. OVIPAROUS
10. B.TWO
11. A. BINARY FISSION

II.

12. Organisms give birth to young ones is called reproduction.
13. Reproduction helps in the maintenance of stable population in the environment
14. Asexual reproduction and sexual reproduction
15. Reproduction take place by the fusion of gametes is called sexual reproduction.
16. A pair of testes, vas deferens, prostate gland and penis.
17. A pair of ovaries, a pair of fallopian tube, uterus and vagina.
18. Tail of the sperm helps in the motility of sperm.
19. The Fusion of sperm and ovum is called fertilization.
20. The single nucleated product obtained by the fertilization is called zygote.
21. Fusion of sperm and ova artificially in the laboratory is called invitro fertilization.
22. Invitro fertilization.
23. The process of fixation of embryo on the inner wall of the uterus is called implantation.
24. Uterus
25. Zygote obtained by the invitro fertilization is developed in uterus is called test tube baby.
26. The structure developed by the repeated division of zygote is called embryo.
27. The process of development of adult frog from tadpole larva is called metamorphosis.

III.

28.

Sexual reproduction	Asexual reproduction
Formation of gametes takes place. Variations are present	Formation of gametes absent Variations are absent

29. Male Reproductive structures of flower is androecium

Female reproductive structures of flower is gynoecium

30.

Internal fertilization	External fertilization
Fertilization take place inside the female body.	Fertilization take place outside of the female body.

31.

Zygote	Embryo
The structure obtained by the fusion of sperm and ova.	The structure obtained by the repeated division of zygote.

32. Egg laying animals are called oviparous animals. Example: birds

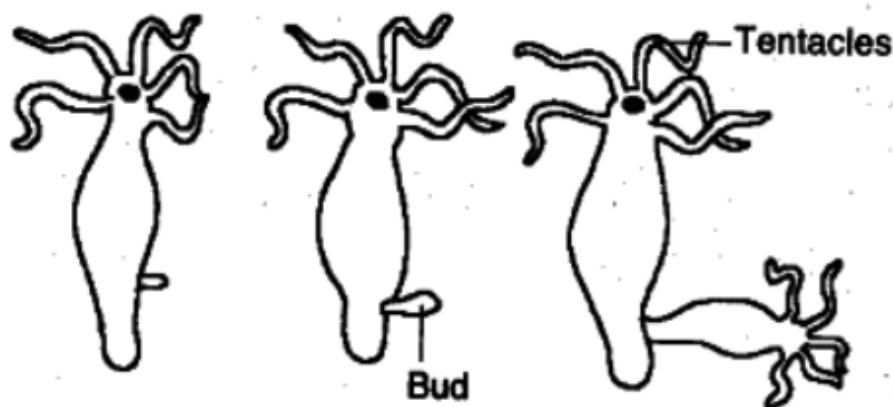
33. The organisms directly give birth to young ones are called viviparous animals.

Example: mammals.

34. Egg → larvae → adult frog

35. The buds developed from the mother organism gradually detached from the mother and develop into new individual.

36. Diagram of budding



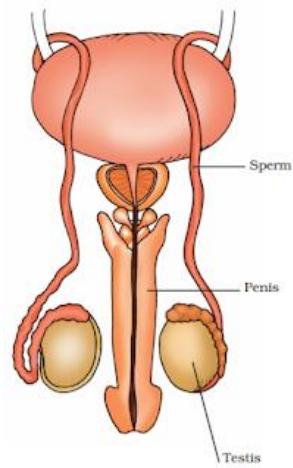
37. Mother organism divides in to daughter cells mitotically is called binary fission.

Example: hydra

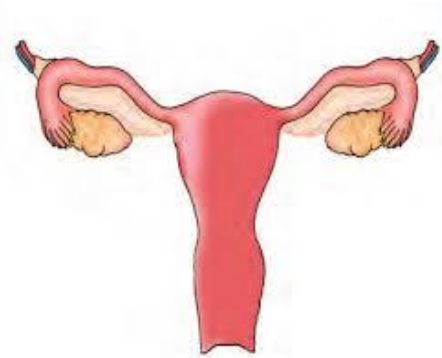
IV.

38. The process of producing individual organism with identical genomes, either by natural or artificial means. It is one of the \asexual method of reproduction. Example: Dolly sheep

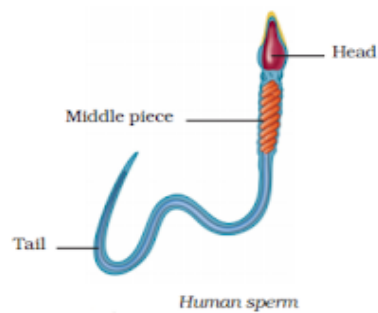
39. Male reproduce system



40. Female reproductive system:

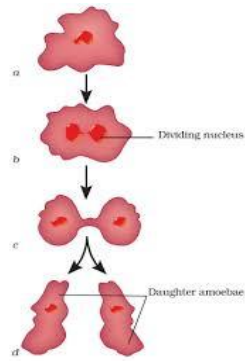


41. Structure of sperm:



42. Reproduction take place by without fusion of gametes is called asexual reproduction. Asexual reproduction includes binary fission, multiple fission, fragmentation, budding.

43. Amoeba binary fission diagram.



V.

44. Stages of life cycle of frog.

- Female frog lays the eggs in the water.
- Male frog discharge sperms on the eggs.
- Fertilization takes place outside of the body.
- Zygote develops in to larvae.
- Larvae develop in to adult frog through metamorphosis.

VI.

45.

- A. Binary fission
- A. Multiple fission
- B. Budding
- C. Leaves
- D. Cloning

7. Reaching The Age Of Adolescence

Multiple Choice Questions

1 For each of the following questions or statements, four alternatives are given. Choose the correct option and write it in alphabetical order

1. Puberty
2. 11 to 19 years
3. Pancreas
4. Adrenaline hormone
5. Fertilization
6. Thyroxine hormone
7. Testosterone-testicle
8. XX chromosomes with 23
9. Human immunodeficiency virus
10. Excessive consumption of processed foods.

II Answer the following questions. (One mark)

11. Glands are specialized organs that secrete hormones.
12. Glands that do not have ducts to deliver the hormones they secrete to the target organs are ductless glands.
13. Hormones are special chemical substances secreted by glands
14. Controls the growth of the body during puberty
15. The stage in which the reproductive system in the body matures
16. Mental, intellectual and emotional maturity
17. A balanced diet is a diet that contains all the nutrients in the right amount.

18. Menopause occurs in women between the ages of 45 and 50

III. Answer the following questions. (Two marks)

19. Mustache growth, voice box cracking, face, chest. Hair growth around the armpits and genitals. Penis erection at night.

20. Breast development, widening of the pelvis, hair growth around the armpits and genitals.

21. In adolescent boys, the voice box grows, making the front of the throat look like a charge, so it is called the Adam's apple

22. Boys - Testosterone-testicle and girls - Estrogen-ovary

23. Men have two chromosomes X, Y. Women have X, X chromosomes. When the male Y chromosome combines with any of the female X, the child becomes a boy. When the male X chromosome combines with any of the female X, the child becomes a girl.

24. Eat a balanced diet. Pay more attention to personal hygiene. Play, do physical exercise

25. In women, a fertilized egg is produced once a month. To receive this egg, the uterus becomes like a sponge with the help of blood vessels. If the egg is not fertilized by the sperm, the blood vessels rupture and the eggs are released through the vagina every 28 days, which is the menstrual cycle.

26 *It comes from having sexual contact with a person infected with HIV. *It comes from a mother infected with HIV to her child *It comes from the blood of an HIV infected person getting into the blood of a healthy person.

IV Answer the following questions. (Three marks)

27 . Physical maturity determines the fitness of an individual. But sexual maturity is reserved only for reproduction and continuation of one's offspring. Sexual maturity is not necessary for an individual to live, survive. Physical maturity happens continuously. Sexual maturity begins in adolescence and stops at a certain stage. Physical maturity depends on the nutrients in the diet. Sexual maturity is controlled by the activity of hormones.

28 .a) Thyroxine hormone

b) Iodine

c) Eggs of insects and frogs do not reach maturity

29 . Explain the following

a. Embryo ; -The developing embryo after fertilization is called embryo

b. Fertilization- ; Fertilization is the process of sperm joining the egg c. Zygote- The substance formed after the process of fertilization by the sperm and egg.

30. . Due to the physical changes that occur in adolescents, these children have a lot of confusion. They start thinking mentally and sometimes are unable to find answers to the questions that arise in their minds. And they hesitate to get answers from their parents. Sometimes they get depressed. Therefore, there is a need for close counselors.

10. Sound

I. 1. D. Solids liquids and gases

2. D. Men

3. B. 20 Hz to 20,000 Hz

4. A. Vacuum

5. C. Solids

6. D. A high pitch sound produces

7. A. Hertz

8. D. travels in vacuum.

9. B. Frequency

10. C. growing more and more plants in our surroundings

II. 11. to and fro or back and forth motion of an object is called vibration

12. The number of oscillations per second is called the frequency.

13.

- i. put some mustard seeds on speaker , enhance sound . mustard seeds jump up and down
- ii. stretch a piece of rubber balloon across one end of the can and fasten it with rubber band . put 4 or 5 grains of dry cereal on the stretched rubber. Now speak from open end . The grains jump up and down.

14.

audible sound	inaudible sound
Sounds of frequencies 20 to 20,000Hz can be detected by the human ear . Such sounds are called audible sound.	Sounds of frequencies less than about 20Hz and higher than 20,000Hz cannot be detected by the human ear . Such sounds are called inaudible sound.

15. Unpleasant sounds are called noise

16. Above 80 decibels the noise becomes physically painful.

17. hertz (Hz)

18. The motion of an object to and fro is called oscillation.

19. The maximum displacement of particles in a medium from their equilibrium position as the wave passes through it.

III.

20. Major causes of noise pollution are sounds of vehicles explosions including bursting or crackers machines loudspeaker etc....

21. The number of oscillations per second of the Vibrating body is known as frequency of oscillation

The frequency = total number of oscillations/total time taken

$$=40/4$$

$$=10\text{Hz}$$

The time period is the time taken to complete one oscillation. It is also inverse of frequency

Time period= 1/Oscillating frequency

$$= 1/10$$

$$= 0.1 \text{ s}$$

Frequency = 10Hz

Time period = 0.1 s

22. Health related problems lack of sleep hypertension (high blood pressure) anxiety and many more health disorders may be caused by noise pollution a person who is exposed to a loud sound continuously may get temporary or even permanent impairment of hearing

23. Silencing devices must be installed air craft engines transport vehicles industrial machines and home appliances

All noisy operations must be conducted away from any residential area

24. Sound plays an essential role in our lives sounds helps us communicate with one another sound is so important because animals can hear events around them regardless of where their attention is focused.

25. Sound Requires a medium to travel , and space is a vacuum. On earth , the atmosphere provides the necessary medium for propagation of sound.

26. a. Ultrasound is used in investigating and tracking many medical problems.

b. Ultrasound is used in SONAR.

IV.

27. The eardrum are tympanum is a thin funnel shaped membrane that separates the external ear from the middle layer in human it is like a stretched rubber sheet and sound vibrations make their drum vibrate the air drum sends a vibration the inner ear and from there the signal is sent to the brain in this way we can hear sounds around us

28. Fill the bucket with water, using your hand try to shake a bell under the water and make sure that the bell does not touch the bucket inside now carefully place your ear on the water surface when you put your ear you will hear the sound of a ringing bell this proves that sound can travel through water

29.

a) Music is a sound which we feel is pleasant to hear sounds from pianos floats and violins are melodic to hear

Noise is defined as unpleasant sound to hear

b) Sounds of frequencies less than 20Hz are called Infrasonic sound

Sounds of frequencies higher than 20,000Hz are called ultrasonic sound.

c) High frequency sound waves are perceived as high pitch sound

Low frequency sound waves are perceived as low pitch sound

V. 30.

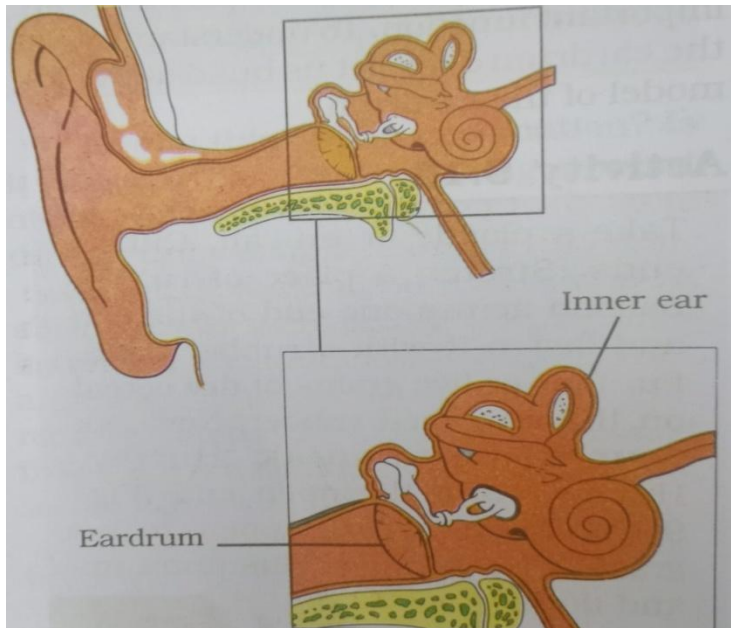
Veena – stretched string

Tabla – stretched membrane

Sitar – stretched string

Flute – air column

31.



32. a) Sound travels slightly faster on humid days
 b) Reduced background noise more stable atmosphere conditions and potential psychological influences
 c) Frequency of the voice is different
 d) Because light travels much faster than sound

11. Chemical Effects Of Electric Current

I.

- 1.A) Aluminium
- 2.C) Tester
- 3.D) Electric heating effect
- 4.C) Light emitting diode
- 5.B) Light emitting diode
- 6.A) solution A is better conductor than solution B
- 7.B) Sugar solution
- 8.A) lemon juice, vinegar
- 9.D) Salt
- 10.A) chemical effect

II

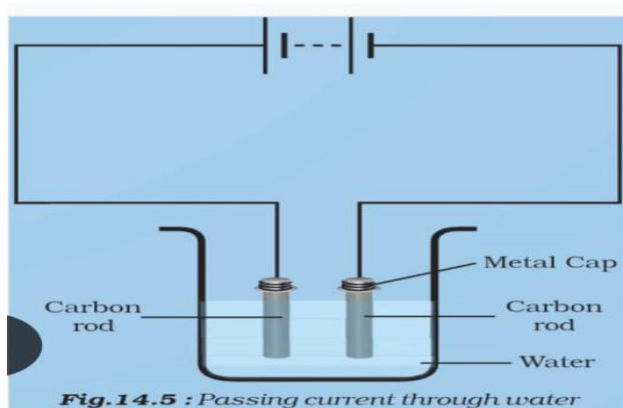
11. Materials that allow electricity to flow through them are called good conductors of electricity.
12. Materials that do not allow electricity to flow through them easily are called electrical insulators.
13. It is used to understand the electricity flow in an electric circuit.
14. We observe the deflection of the magnetic needle.
15. Light emitting diodes light up even when very little current flows.
16. An electrode is an electrical conductor used to make contact with a non-metallic part of a circuit.
17. When electricity flows through conductive solutions, a chemical reaction takes place. The effect that occurs is called the chemical effect of electric current.
18. Tap water has many dissolved salts. It naturally contains small amount of minerals also. Therefore this water is good conductor of electricity.
19. Electricity does not flow through distilled water. Distilled water is free of salts therefore it is a poor conductor of electricity.
20. The process of applying a thin layer of another desirable metal to an object using electricity is called electroplating.

III.

21. Electric conductors- copper, iron
Electric insulators- glass, charcoal
22. Due to thermal effect of electricity, the wire in the bulb heats up and emits light at high temperature.
23. Water is a good conductor of electricity. Water can come into contact with electricity and cause electrical accidents. Therefore when a fire breaks out, fire fighters turn off the main power supply before using water to put out the fire.
24. Sea water contains a high concentration of dissolved salts. Drinking water contains a low concentration of dissolved salts. Therefore the magnetic needle is bending in sea water.
25. Not suitable. Even rain water contains small amount of salts. Rain water is also good conductor of electricity. Therefore when it is raining an electrician repairing electrical equipment outside can cause electric shock.
26. 1. Even rain water contains salts.
2. Rain water is also a good conductor of electricity.
Therefore tested with a tester, a deflection of the magnetic needle is observed.
27. Car parts, bathroom taps, kitchen gas burners, bicycle handles and wheel rims.
28. Tin is less reactive metal than iron. Thus the food does not come in to contact with the iron and food is preserved from spoilage.
29. Iron rusts easily therefore a thin layer of zinc is applied to iron to prevent corrosion and rusting.

IV.30.

II.



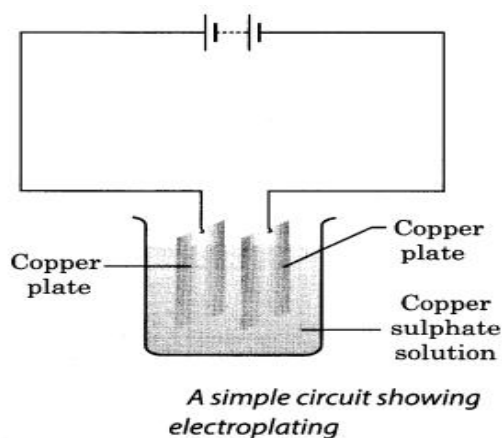
31.

1. The bulb wire may have melted.
2. The battery may have lost its capacity.
3. The circuit may be loose.

32.

1. When electricity passes through an electrolyte solutions, a chemical reaction occurs. That is why gas bubbles may appear on the electrode.
2. A metal coating may appear on the electrode.
3. The colour of the solution may change.
4. The chemical reaction depends on the solution and electrodes used. These are some of the chemical effects of electric current.

33.



34. In the electrolytic purification method, an impure metal is connected to the positive terminal and a thin sheet of pure metal is connected to the negative terminal. A solution of a metallic salt is used as the electrolytic medium.

When electricity is passed through copper sulphate solution, the copper sulphate dissociates into copper and sulphate ions. The free copper ions move towards the negative electrode of the battery and accumulate on it. An equal amount of copper from the other electrodes a copper strip is dissolved in the copper sulphate solution.

35.

1. Chromium has a special luster.
2. It is not subjected to corrosion.
3. It has anti scratch properties.

4. Chromium is very expensive so items are not made entirely of chromium.

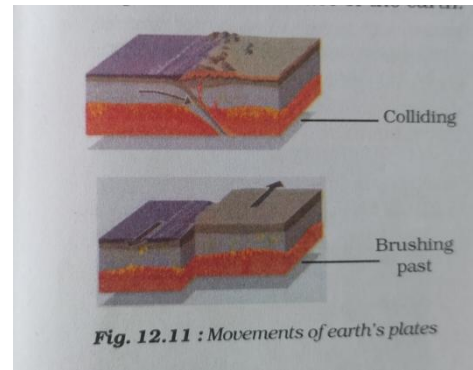
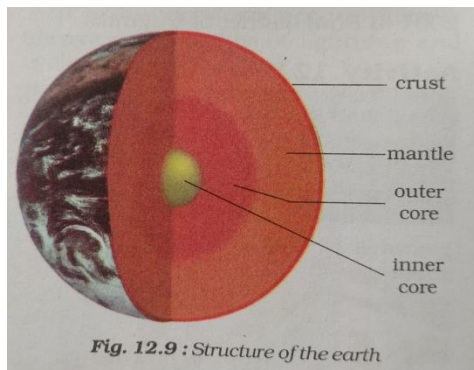
12.Natural Phenomena

1. Thunder
2. Charged balloon and uncharged refill
3. Bathing
4. Earthquake
5. Seismograph

6. Mud and wood
7. The process of electric discharge between clouds and the earth or between different clouds causes lightning.
8. Lightning conductor
9. Hearing thunder is an alert to rush into a safer place. After hearing the last thunder wait for some time before coming out of safe place.
10. Earth quake
11. Seismograph
12. The charges transfer from a charged body to the earth .Thus it loses its charge.
13. At the time of thunder negative charges accumulated near clouds, positive charges near the ground.
when these meet electric discharge takes place between ground and clouds.
14. Because the conducting wire used in land line may attract charges and may occur lightning stroke.
15. Collapse of buildings
loss of life.
16. Earthquakes are caused by the movement of tectonic plates . The boundaries of the plates are weak Zones where earthquake are more likely occur. These weak zones are called fault zones.
17. Find open field and stay away from building ,trees ,electrical poles.
If you are driving a car then go to open field and do not came out of your car.
18. The device used to protect tall buildings from lightning is called lightening conductor. The electrical charge can be transferred from a charged object to another through a metal conductor. Touch the end of the paper clip gently with hand and you will find a change in the foil strips. They come back to their original state . Repeat charging of foil strips and touching the paper clip. Every time you will find that the foil strips collapse as soon as you touch the paper clip with hand. The reason is that the foil strips lose charge to the earth through our body.
19. They will attract each other due to the presence of unlike charges on them.
20. The process of electric discharge between clouds and earth or between different clouds causes lightning. Electric charges and clothes gets transferred from a cloud to cloud and cloud to earth. At excise the positive charges collect near the upper clouds and the negative charges accumulated near lower edges of Clouds. Accumulation becomes very loss the charges weight producing bright light and sound. This is how lighting occurs.
- 21.

An earthquake is a sudden shaking or trembling of earth which lasts for a short time. This is caused by disturbance inside the earth's crust. In crust the sedimentary plates are in continual motion. The sedimentary Plates are brush part one another and plates goes under another due to collission. This causes disturbance in earth's crust results in earthquake.

22.



23. If air and cloud were good conductors of electricity then charge separation will not take place and hence Lightning will not occur.

24. Consult qualified architects and structural engineers. In highly seismic areas the use of mud and wood is better than heavy construction material. It is better if the cupboards and shelves are fixed to the walls. Buildings should contain fire fighting equipment.

25. No open place is safe. House or building is safe place.

If travelling by car or by bus it is safe to stay inside with windows and doors closed.

Carrying an umbrella is not at all a good idea during thunderstorms. Keep away from trees.

26. Materials can be charged through friction, conduction, and induction. Like charges repel when the two objects have the same type of charge, and they attract each other when the objects have opposite charges.

Imagine two balloons. If you rub a balloon on your hair, it gains electric charge. Rub two balloons and then try to bring them close; they will repel each other. When you rub a balloon on your hair, the balloon becomes negatively charged while hair becomes positively charged, and then they will attract each other.

27. Natural disaster refers to an event caused by natural phenomena rather than human actions.

Some common types of natural disasters are floods, earthquakes, landslides, tsunamis.

The reasons for natural disaster are

1. Earthquake, volcanoes, and tsunamis are caused by movement of tectonic plates.
2. Atmospheric and oceanic conditions
3. Human causes and influences like climate change, deforestation, and pollution

13. Light

1. B. direction
2. A. incident ray
3. B. reflected ray
4. A. the angle of incidence ($\angle i$)
5. B. Combination of seven colours
6. C. iris
7. A. a small hole
8. A. dim light
9. D. retina
10. A. cones
11. A. cones
12. D. retina
13. B. $1/16^{\text{th}}$ of a second
14. A. 24
15. B. washing our eyes with clean water
16. We can't see the objects on the other side of wooden wall because wooden wall is opaque.
17. According to laws of reflection, $\angle i = \angle r$
 $\angle i + \angle r = 100^\circ$
 $\angle i = \angle r$
 $2\angle i = 100^\circ$
 Angle of incidence $\angle I = \frac{100}{2} = 50^\circ$
18. A glass plate with a shiny surface on one side that reflects light and forms an image is called as mirror.
19. When the reflection takes place in a mirror, the left and right side of the image reversed compared to the object. This phenomenon is known as lateral inversion.
20. Regular reflection and irregular reflection.
21. Irregular reflection takes place on the rough surface because the reflecting surface has an irregular arrangement of particles.
22. Regular reflection takes place on the smooth surface. This is because its reflecting surface has a regular arrangement of particles.
23. Though the Moon is not a self-luminous object, the Moon is visible to us when sunlight falls on and reflects off the Moon's surface.
24. According to the law of reflection, the angle of reflection is equal to the angle of incidence. Hence the angle of reflection is also 40° .
25. The device which works on the principle of multiple reflection when mirrors are placed at an angle to one another to produce numerous beautiful images is called as kaleidoscope. It is used to design the wallpapers.
26. Periscope is used in submarines to see the objects outside.
27. The least distance at which a person can read clearly with a normal eye is 25 cm.
28. The deficiency of Vitamin A causes night blindness.
29. On blind spot no image is formed because there are no vision receptor cells present on this spot.
30. The color of the iris causes distinct colour of the eyes.
31. *The pupil controls the amount of light that enters the eye.

*The size of the pupil dilates to dim light and contracts to bright light.

32. The retina is the part of the eye where the lens focuses light.

33. Visually impaired persons read with the help of Braille texts

34. No, we cannot see objects in a dark room because objects are visible to us only when light reflected or emitted from the surface of the object enters our eyes.

35. *Light is essential for objects to be visible.

*Plants prepare food with the help of sunlight in photosynthesis.

*Optical instruments like microscopes and telescopes work by using light

*Electricity can be generated from light.

Therefore, light is a form of energy.

36. The reflected light from an object enters our eyes. An image is formed when the lens focusses that light on retina. An image is formed on retina so an object becomes visible.

37. **First law of reflection**:-The angle of incidence is always equal to the angle of reflection,

Second law of reflection :- The incident ray, reflected ray and normal all lie in the same plane.

38. Fig (a) – Irregular reflection eg: Old scratched steel plate, Rough floor, Old mirror (any one)

Fig (b)- Regular reflection eg: New steel plate, New glass mirror, pond (any one)

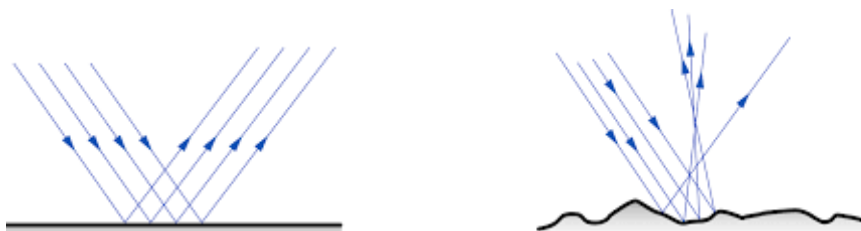
39. Foods rich in vitamin A are Raw Carrots, broccoli, green vegetables (such as spinach), Cod liver oil, Egg, Papaya, mango, milk, curd, cheese and butter (any four)

40. *The object which emits light are called luminous objects.

*The sun, fire, candle flame, and an electric lamp are examples for luminous objects.

(any two)

41.



42. The lens focusses incident light on retina, which contains several nerve cells. The nerve cells sensations are then transferred to the brain through the optic nerve.

43. a. Regular reflection

b. Irregular reflection

c. Irregular reflection

d. Regular reflection

44. Fast moving fan blades appear blurred

*This is due to the reflection from the continuous movement of the fan blades remains on the retina for less than 1/16th of a second.

* That results in the formation of non-clear image.

45. Reflection of light from the wall is a diffused reflection and reflection of light from a mirror is a regular reflection.

When light rays incident on the

- * wall ,that forms diffused reflection because it has an irregular surface.
- * While the mirror forms regular reflection because it has a smooth surface.

46. A-Optic nerve

B- Blind spot

C-Retina

D-lens

47. Usually eye specialists suggest to consume papaya and green vegetables (spinach) more to maintain health conditions of eyes.

- * This is because vitamin A deficiency leads to many eye problems.
- *Papaya and green vegetables are rich in vitamin A, which keeps the eyes healthy.

48. *The near point of the human eye or least distance of distinct vision is 25 cm.

- * If we keep books within that distance the image is not formed properly on retina.

So it is not possible to read books if we bring too nearer to our eyes.

49. * It is cataract.

* By removing the foggy muscular layer of the lens and replacing it by artificial lens, the vision can be made better.

50. *Yes, irregular reflection obeys the laws of reflection. This is because

- * Irregular reflection is usually caused by a rough surface.
- * Each microparticle of a rough surface acts like a mirror and reflects light.

51. Properties of image formed by a plane mirror are:

1. Plane mirror forms virtual images.
2. Plane mirror forms erect images.
3. Image is laterally inverted.
4. Image formed is of the same size as the object.
5. The distance of image from the mirror is equal to the distance of object from the mirror.

52. A night bird (owl) can see clearly at night, because

- * it has a wide cornea and a large pupil to allow more light to enter its eye.
- * Also, it has a large number of rod cells and a small number of cones in its retina.
- * Rods are sensitive to dim light.

Therefore, the eyes of night birds are more adaptable to dim light than to bright light.

53. In the picture, there are two plane mirrors in front of and behind a seated observer. The rear mirror is held by a standing person. The image of the back of the seated observer's head is reflected in the plane mirror in front. Both his own direct image and back side of his head that is reflected by rear mirror can be seen in the front mirror. This is a good example of how reflected light can be reflected again.

54. The aids which help visually impaired are classified as follows.

1. Visual aids, 2. Textual aids 3. Auditory aids and 4. Electronic aids.

* Visual aids can magnify words can provide suitable intensity of light and material at proper distance.

* Textual aids include brail writers slate and stylus, help the visually challenged persons in taking notes, reading and writing.

* Auditory aids include talking books.

* Electronic aids include calculator and computers. When a kaleidoscope is rotated while looking through the end of a transparent tube, a colorful pattern emerges.

55. To make a kaleidoscope get three rectangular mirror strips each about 15 cm long and 4 cm wide joint them together to form a Prism. Fix this arrangement of mirrors in a circular cardboard tube or tube of a thick chart paper. Make sure that tube is slightly longer than the mirror strips. Close one end of the tube by cardboard disc having a hole in the centre through which you can see. To make the disc durable paste a piece of transparent plastic sheet under the cardboard disc. At the other end touching the mirror, fix a circular plane glass plate. Place on this glass plate several small pieces of coloured glass. Close the end of the tube by ground glass plate. Allow enough space for the colour pieces to move around. When a kaleidoscope is rotated while looking through the end of a transparent tube, a colorful pattern emerges.

56. Take two plane mirrors. Place them perpendicular to each other so that their edges touch and use adhesive tape to connect them. Place a coin between the mirrors. You will see many reflections of the coin. Now attach the mirrors at different angles with the help of adhesive tape. 45° , 60° , 120° , 180° . Place some object (e.g. candle) between them. Note the number of reflections of the object in each case.

57. (a) Splitting of light into its colours when the light rays passes through glass prism is known as dispersion of light. Rainbow is a natural phenomenon showing dispersion.

(b) Place a plane mirror of suitable size in a bowl. Fill the bowl with water. Put this arrangement near a window in such a way that the direct sunlight falls on the mirror. Adjust the position of the bowl so that the reflected light from the mirror falls on the wall. Reflected light will be seen to have many colours. It is because the mirror and water acts as prism.

58. Precautionary measures that are followed to protect our eyes are as follows

(any four)

1. Consult an eye specialist if you have any problem.

2. Use appropriate glasses if you have vision problems.

3. Do not read in too dim light or too bright light

4. Eat vegetables and fruits rich in vitamin A regularly.

5. Do not stare at the bright light of the sun or laser light.

6. When dust particles enter the eyes, rinse them with clean water without rubbing them. bright light.

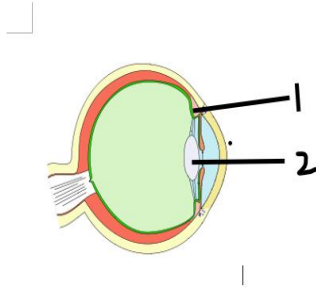
59.

60.

by

rays

produces an inverted image of the object. The retina contains many nerve cells. The sensations felt by the nerve cells are then transmitted to the brain by the optic nerve. The brain perceives the image of the object.



1. Ciliary muscles

2. Lens

Behind the pupil of the eye is a thick lens in the middle. The pupil is a small opening controlled the iris. The iris controls the amount of light entering the eye. The Lens focuses the light reflected from the object onto the retina, which