केन्द्रीय विद्यालय संगठन

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आंचलिक शिक्षा एवं प्रशिक्षण संस्थान, मैसूर

ZONAL INSTITUTE OF EDUCATION AND TRAINING, MYSURU

विज्ञान में योग्यता आधारित मूल्यांकन: परीक्षण वस्तुओं का रचना

Competency Based Assessment in Science: Design of test items

(31.07.2024-02.08.2024)

CLASS VIII

SCIENCE

DIRECTOR'S MESSAGE……

It is with profound delight and utmost pride that we present the Competency Based Assessment question bank for **CLASS VIII** which was prepared by TGT(Science) of the feeder regions during the 03–day workshop on "**Competency Based Assessment in Science: Design of test items**" It's my firm belief that access to quality education should know no boundaries, transcending social and economic constraints. Our collective vision is to empower all students and teachers with the tools for success and intellectual growth.

With their steadfast dedication, the TGT(Science) from the feeder Regions namely Bangalore, Chennai, Ernakulam and Hyderabad have invested their knowledge and expertise in preparation of the CBA test items.

It is with pleasure that I place on record my commendation for the commitment and dedication of the team of TGT(Science) from the four Regions, Shri. Manoj Kumar Paliwal, Principal KV No.1 Madurai, Chennai Region &
Associate Course Director, the Resource persons Ms Seema Saraswat, TGT(Science) KV Vijaypura and Ms Neeta Wage TGT(Science) KV Hebbal and Mr. Dinesh Kumar, Training Associate (Physics) from ZIET Mysore who has been the Coordinator of this assignment.

Wishing you all the very best in your academic journey!

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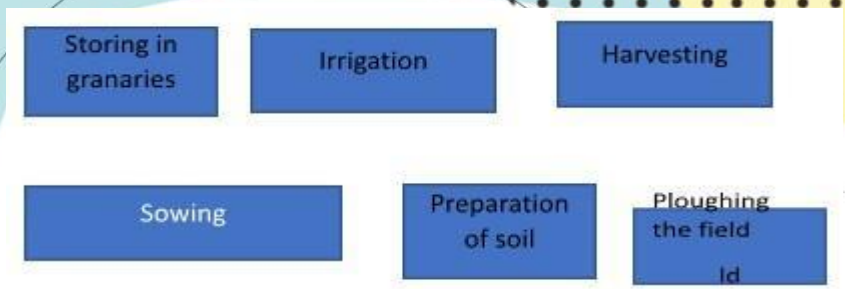
CLASS – VIII

TABLE OF CONTENTS

CHAPTER 1- CROP PRODUCTION AND MANAGEMENT

Q NO	SECTION A	MARKS
1	Weeding involves removal of unwanted and uncultivated plants called a) crop b) granaries c) seeds d) weeds	1
2	If you are given a dry piece of land for cultivation, what will you do : a) Adequate watering to restore the moisture b)Tilled and ploughing for aeration c) manure is mixed to the soil d) all the above	1
3	Bhoojho wants to water his fruits plants, gardens and trees,he wants to adopt an irrigation system in which water is not wasted. Select the appropriate irrigation techniques a) Sprinkler system b) Drip system c) Pulley system d) Lever System	1
4	Improper use of fertilizers can cause: a) soil alkalinity and sol acidity b) soil acidity only and soil erosion c) soil acidity only d) soil erosion only	1
5	Good , healthy seeds when put in water then they : a) sink b) germinate c) float d) none of these	1
6	Which of the following statements is not true for organic manure? (a) It enhances the water holding capacity of the soil (b) It has a balance of all plant nutrients. (c) It provides humus to the soil. (d) It improves the texture of the soil	1
7	In the following questions , the Assertion and Reason have been put forward .Read the statements carefully and choose alternative from the following : (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion . (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion . (c) Assertion is true but the Reason is false (d) The statement of the Assertion is false but the Reason is true. Assertion : Food is also obtained from animals for which animals are reared . This is called animal husbandry . Reason : Animals reared at home or in farms , have to be provided with proper food ,shelter and care.	1
8	Assertion : The grains are properly dried in the sun . Reason : This prevents the attack by insect pests,bacteria and fungi.	1
	SECTION B	
9	A farmer wants to grow the crop of wheat ,arrange the following boxes of basic practices in proper order , which he will use for crop production	2

		
10	Why are few plants such as paddy and flowering plants grown in the nursery and when they grow into plantlets, they are transplanted in the field manually ?	2
11	It is strongly advised to wash fruits and vegetables before using them. Why?	2
12	Identify the following instruments used in agriculture and write their name and advantages. 	2
13	If Mustard is sown in the Kharif season, what would happen? Discuss.	2
	SECTION C	
14	Continuous and excessive use of chemical fertilizers in the long run can affect the fertility of the soil. Justify.	3
15	What is harvesting? What are the different methods used for harvesting?	3
16	In a school, a field trip is arranged to see the crop field. Jaya noticed that along with wheat crops few unwanted plants are grown. What are these plants called? How these plants affect the growth of the crop. Name two methods to control them.	3
	SECTION D	
17	Storage of produce is important. Why? What precaution farmers should keep in mind before storing the freshly harvested produce. Briefly describe the methods involved in storing the produce.	5
18	Nowadays farmers are using modern agricultural implements over traditional ones. Discuss.	5
	SECTION E	

19	In the Fig below in glasses A,B and c gram seeds are grown  i) glass A contains little amount of soil mixed with a little cow dung manure. ii) glass B contains the same amount of soil mixed with a urea. iii) glass C contains the same amount of soil without adding anything. a) Which glass shows the slowest growth and Why ? b) Organic manure is considered better than fertilizers .Why ? c) Name some chemical fertilizers	 1 2 1
20	The supply of water to crops at different intervals is called irrigation . The time and frequency of irrigation varies from crop to crop ,soil to soil and season to season .To maintain the moisture of the soil for healthy crop growth, fields have to be watered regularly . a) In summer, the frequency of watering is higher .Why ? b) Device a strategy that will help a farmer to have a better yield in sandy soil . c)How much water does a plant body contain ?	 1 2 1

ANSWER KEY (CHAPTER 1- CROP PRODUCTION AND MANAGEMENT)

Q NO	SECTION A	MARKS
1	d) weeds	1
2	d) all the above	1
3	b) Drip system	1
4	b) soil acidity only and soil erosion	1
5	c) float	1
6	b) It has a balance of all plants nutrients	1
7	c) Assertion is true but the Reason is false	1
8	a)	1
	SECTION B	
9	i) Preparation of soil ii) Ploughing the field iii) sowing iv)irrigation v) Harvesting vi) Storing in granaries	2
10	It allows to plant the seedlings at the right spacing and select only healthy seedlings for the plants	2
11	Fruits and vegetables may contain many pesticides that can enter the body ,causing serious health problems.	2
12	Plough . Any advantage	2
13	Mustard is a Rabi crop, so it is generally sown in the Winter season .So it doesn't require much water, lack of optimum temperature and various other physical conditions.	2
	SECTION C	
14	Continuous and excessive use of chemical fertilizers can change pH of soil, kill soil microorganism and reduce the organic matter and humus in the soil.	3
15	The cutting of the crop after it is mature. The different methods used for harvesting are Using a sickle and harvester.	3
16	These unwanted plants are called weed. Weeds compete with the main crop plant for air, water, sunlight and nutrients. Weeds are removed with the help of khurpi and by using weedicide.	3
	SECTION D	
17	High moisture and high temperature favour development of insects and moulds that affect grain quality. Grains must be sun dried thoroughly.Two methods involved in storing the produce.	2 1 2
18	Any 5 advantages of using modern agriculture implements over traditional ones.	5
	SECTION E	

19	a) Glass C .Reason b) Two advantage of manure over chemical fertilizers c) Urea ,ammonium sulphate , Potash NPK	 1 2 1
20	a) Increased rate of evaporation of water from the soil and leaves b)i) Growing crops suitable for sandy soil. ii) Using sprinkler irrigation system c) 90%	1 2 1

CHAPTER 2- Microorganism: Friends and Foe

Q NO	SECTION A	MARKS
1	Some medicines obtained from microorganisms are applied to kill or stop the growth of disease causing microorganisms. Such medicines are called a) antibodies b) antibiotics c) antiseptics d) all the above	1
2	In Ram village malaria is spreading ,select the preventive measure Ram would use to prevent disease : a) Consume properly cooked food b) Drink boiled drinking water c) Use mosquito net and repellents d) Keep the personal belongings of the patient away from those of the others	1
3	Paheli wants to know incorrect sentences about viruses ? a) Viruses are microscopic . b) Reproduce only inside the cells of the host organism c) Virus do not respire, feed ,excrete or move d) none of the above	1
4	Rhizobium found in root nodules of leguminous roots is an a) Atmospheric Carbon fixer b) Atmospheric Oxygen fixer c) Atmospheric Nitrogen fixer d) All of the above	1
5	M**ilk** turned into curd by_____ ? a) yeast b) Bacteria c) Protozoa d) none of these	1
6	Deliberately injecting weak microbes into a healthy body and producing antibodies to fight against strong microbes is called a) Medication b) Antibiotics c) vaccination d) All of the above	1
	In the following questions , the Assertion and Reason have been put forward .Read the statements carefully and choose alternative from the following : (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion . (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion . (c) Assertion is true but the Reason is false (d) The statement of the Assertion is false but the Reason is true.	1

7	Assertion : Food poisoning could be due to the consumption of food spoilt by some microorganisms . Reason :.Microorganism that grow on food produce toxic substances.	
8	Assertion :Microorganisms can spoil food , clothing and leather . Reason : Some of the microorganisms cause diseases in human beings,plants and animals are called pathogens	1
	SECTION B	
9	Differentiate between viruses and other microorganisms.	2
10	It is always suggested not to eat anything from street hawkers. Why?	2
11	Write short notes on (a) Protozoa (b) Alga	2
12	Jam, Jellies and squashes contain sugar as a preservative?	2
13	Hari's mother added a little curd to warm milk to set curd for the next day .Why do you think Hari's mother added curd to the milk?	2
	SECTION C	
14	Explain nitrogen cycle and draw a schematic diagram of nitrogen cycle.	3
15	What are antibiotics? What precautions must be taken while taking antibiotics?	3
16	Neha 's mother bought some raw mangoes ,Neha wants to preserve these mangoes for a longer time . Answer as per questions asked below. a) Suggest the method of preservation her mother will use. b) Define the process. c) Identify the type of preservative used in our kitchen	3
	SECTION D	
17	Observe the image below and answer the questions.  **Fig. 2.1** https://schools.aglasem.com/60019/ (a) Write the name of the disease. (b) Name the causative agent of this disease?	5

	(c) How does the disease spread from one plant to another? (d) Name any two plant diseases and the microbes that cause them.	
18	Give reasons for the following. (a) Fresh milk is boiled before consumption while processed milk stored in packets can be consumed without boiling. (b) Raw vegetables and fruits are kept in refrigerators whereas jams and pickles can be kept outside. (c) Farmers prefer to grow beans and peas in nitrogen deficient soils.	5
	SECTION E	
19	Microorganisms are used for various purposes. They are used in the preparation of curd, bread and cake ..Microorganisms have been used for the production of alcohol since ages. They are also used in cleaning up the environment. For example, the organic wastes (vegetable peels, remains of animals, faeces, etc**.)** a) Explain the process of doubling of flour after addition of yeast into it. b) Name some of the medicinal uses of microorganisms**.** c) Name any one microorganism which led to pandemic in recent times and suggest some preventive measures.	 2 1 1
20	Paheli dug two pits, A and B, in her garden. In pit A, she put polythene bags , glass bottles and broken toys . In pit B, she dumped the plant waste . She then covered both the pits with soil for 1 month . Answer the following questions. a) What difference did she observe after a month in pit A and pit B? b) Suggest a method you will use to treat your kitchen waste. c) What are decomposers?	 1 2 1

ANSWER KEY (CHAPTER 2– Microorganism: Friends and Foe)

<table>
<tr><th>Q NO</th><th>SECTION A</th><th>MARKS</th></tr>
<tr><td>1</td><td>b) antibiotics</td><td>1</td></tr>
<tr><td>2</td><td>c) Use mosquito net and repellents</td><td>1</td></tr>
<tr><td>3</td><td>d) none of the above</td><td>1</td></tr>
<tr><td>4</td><td>c) Atmospheric Nitrogen fixer</td><td>1</td></tr>
<tr><td>5</td><td>b)Bacteria</td><td>1</td></tr>
<tr><td>6</td><td>c) vaccination</td><td>1</td></tr>
<tr><td>7</td><td>a)</td><td>1</td></tr>
<tr><td>8</td><td>b)</td><td>1</td></tr>
<tr><td></td><td>SECTION B</td><td></td></tr>
<tr><td>9</td><td>
<table>
<tr><th>Viruses</th><th>Other microbes</th></tr>
<tr><td>(i) They show the characteristics of living organisms or reproduce only by entering the host organisms.</td><td>(i) They do not need to enter any host organism to reproduce or show any characteristics of life.</td></tr>
</table>
</td><td>2</td></tr>
</table>

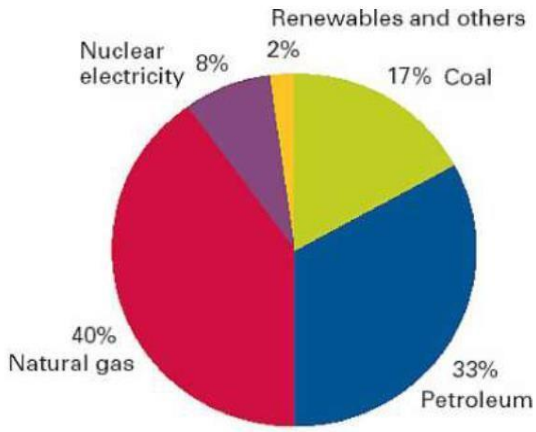
	(ii) They are non-cellular microbes.	(ii) They are cellular microbes.
10	Most street hawkers sell food items in an open area which always get contaminated with the dust and flies carrying germs with them. Such an unhygienic condition leads to spoilage of food which when consumed can lead to serious illness.	2
11	**Protozoa:** Protozoa are unicellular animals. Some are free-living, others are parasites. Several parasitic protozoans cause diseases in human beings, domestic animals and plants. For example, Plasmodium, a protozoan, causes malaria. **Algae:** Algae are green substances floating on the surface of a pond, lake, river, stagnant water, moist soil, stones. They tend to grow on wet surfaces. Therefore, they can synthesize their own food. They are found in water or in very moist places.	2
12	Sugar is used as a preservative in jams, jellies and squashes. Sugar reduces the moisture content which inhibits the growth of bacteria which spoil food.	2
13	Curd contains several microorganisms .Of these the bacterium ,Lactobacillus promotes the formation of the curd .	2
	SECTION C	
14	The nitrogen cycle is the biogeochemical cycle by which nitrogen is converted into multiple chemical forms as it circulates among atmospheric, terrestrial, and marine ecosystems. The conversion of nitrogen can be carried out through both biological and physical processes. Diagram	1 2
15	Antibiotics Are medicines produced by certain microorganisms to kill other disease-causing microorganisms. These medicines are commonly obtained from bacteria and fungi. Streptomycin, tetracycline, penicillin, etc. are common antibiotics. Precautions to be taken while using antibiotics**:** (i) Antibiotics should be taken under the supervision of a well qualified doctor. (ii) Course (intake) of antibiotics should be completed as per the prescription given by the doctor. (iii) Antibiotics should be taken in the right amount and at the right time. A wrong dose of antibiotics makes the drug ineffective. Also, excessive consumption of drugs may kill the useful bacteria present in our body.	3
16	a) The method of preservation are use of oil, salt and vinegar	3

	b) Food preservation is the technique to prevent food spoilage ,food poisoning ,and microbial contamination in food. c) The type of preservatives used in our kitchen are common salt ,sugar ,oil and vinegar etc.	
	SECTION D	
17	a) Yellow vein mosaic of bhindi b) Virus c) Mode of Transmission - Insect d) Citrus Canker – Bacteria , Rust of Wheat – Fungi	1 1 1 2
18	(a) Fresh milk must be boiled in order to destroy any harmful microorganisms that may be present. While processed milk has been pasteurized, making it safe to consume straight. Pasteurized milk is boiled at 70 degrees Celsius and then suddenly cooled. (b) They're kept in the fridge because bacteria can't grow at low temperatures. Sugar and salt make jams and pickles resistant to microbial infection (c) Leguminous plants such as peas and beans have nitrogen-fixing bacteria called Rhizobium	2 2 1
	SECTION E	
19	a) After adding yeast into the flour, the yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of gas fill the dough and hence the volume of dough is doubled in size. b) Antibiotics and Vaccine . c) i) Coronavirus ii) Any of the preventive measure	1 2 1
20	a) Waste in pot B has been decomposed whereas waste in pot A did not undergo any change . b) Composting (explain) c) Microorganisms which can decompose dead organic waste of plants and animals.	1 2 1

CHAPTER 3- COAL AND PETROLEUM

Q NO	SECTION A	MARKS
1	Compressed natural gas is green gas, due to its nature it is been used in a. Power generation b. Electric generators c. Solvent d. None of these	1
2	**PCRA stands for** a. Pollution control research association b. Petroleum conservation Research association c. Petroleum control research association d. Petrol, coal reserve association	1
3	Good quality of Roads shows development. In order to enhance the quality of roads identify the material used for road construction: (a) Peat (b) Bitumen (c) Lignite (d) Anthracite	1
4	Government from time to time is providing subsidy and encouraging solar panels to be installed, government decision can be justified on bases that sunlight is (a) exhaustible natural resource (b) Inexhaustible natural resource (c) exhaustible artificial resource (d) Inexhaustible artificial resource	1
5	Suhaas is an industrialist and recently got government permission to start Steel industry at Ramagundam, suggest him the product of coal which is a raw material for said industry from the following (a) Coal tar (b) Anthracite (c) Coke (d) Peat	1
6	Petroleum is separated by using the difference in (a) ignition temperatures (b) melting points (c) freezing points (d) boiling point.	1

7	**Q. no 7-8 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:** **(a) Both A and R are true and R is the correct explanation of A** **(b) Both A and R are true and R is not the correct explanation of A** **(c) A is true but R is false** **(d) A is False but R is true** **7.** Assertion: Fossil fuels are formed from dead and decaying matter. Reason: CNG is the best example of fossil fuel.	1
8	Assertion: Coke is a pure form of coal Reason: Coal gives away oxygen during burning.	1
	SECTION B	
9	A product of coal is a mixture of about 200 substances. Identify the product and write its uses in our daily life.	2
10	Differentiate between exhaustible and inexhaustible natural resources with examples	2
11	Write two uses of Paraffin wax.	2
12	Coal is considered as fossil fuel. Explain	2
13	What are petrochemicals?	2
	SECTION C	
14	Burning of fossil fuels is a major cause of concern. Evaluate the statement.	3
15	Illustrate the advantages CNG has over other fuels. **OR** List the uses of coal tar	3
16	Madhu keenly heard her science teacher talking about petroleum products. She wants to prepare coal and natural gas in the laboratory from dead organisms. Is it possible for her? Justify logically and defend your answer.	3

	SECTION D	
17	(a). Sustainable development will lead to longevity of our future. Evaluate and draw your conclusion with respect to the importance of conservation of inexhaustible natural resources. (3m) (b). Recommend a list of alternate sources of energies which would keep our earth clean and green. (2m)	5
18	(a). Give 3 tips by PCRA to save petrol/diesel while driving. (3m) **OR** Arrange the sequence of events in the formation of coal (b). Analyze the importance of black gold (2m)	5
	SECTION E	
19	III. CASE STUDY-BASED QUESTIONS: 1. This is a pie chart about energy sources in country Y in the year 2018. Examine it and answer the questions given alongside:  (a) What percentage of fossil fuels did Country Y consume that year? (1M) (b) Do you find that renewable sources play an important role in the country? Why? (1M) (c)Mention the names of fossil fuels used by this country. (1M) (d) Which fossil fuel used by country Y is a clean fuel?(1M)	4
20	In the light of the availability of various resources in nature, natural resources can be broadly classified into two kinds- Inexhaustible and Exhaustible resources. Inexhaustible natural resources are present in unlimited quantities in nature and are not likely to be exhausted by human activities. Examples are sunlight, and air. Exhaustible resources are present in limited quantities in nature. They can be exhausted by human activities. Examples of these resources are forests, wildlife,	4

	minerals, coal, petroleum, natural gas etc. some exhaustible natural resources like coal, petroleum and natural gas. These were formed from the dead remains of living organisms (fossils). So, these are all known as *fossil fuels.* (a) Assess the reason for sunlight being an inexhaustible source of energy and also formulate and recommend to make good use of this inexhaustible source.(1 m) (b) Justify as to why petroleum products are considered as fossil fuels. (2m) (c) Under which category of resource the wildlife can be placed.(1m)	

ANSWER KEY (CHAPTER 3- COAL AND PETROLEUM)

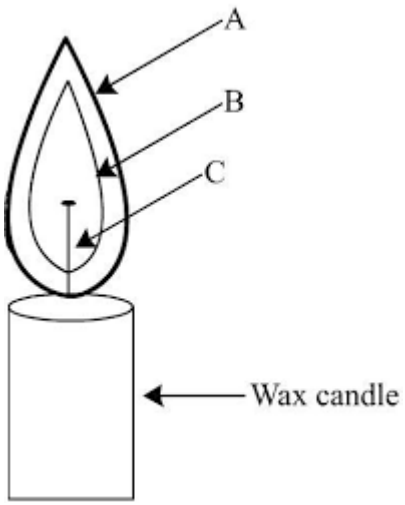
Q NO	SECTION A	MARKS
1	a	1
2	b	1
3	b	1
4	b	1
5	b	1
6	d	1
7	b	1
8	c	1
	SECTION B	
9	Coal tar and any two uses of it.	2
10	Any two differences with examples	2
11	Any two uses of paraffin wax.	2
12	Under high pressure and high temperature, dead plants got slowly converted to coal. As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonization.	2

13	Substances which are useful and obtained from petroleum and natural gas.	2
	SECTION C	
14	When fossil fuels are burned, they release large amounts of carbon dioxide, a greenhouse gas, into the air. Greenhouse gases trap heat in our atmosphere, causing global warming.	3
15	• Green Fuel. Commonly referred to as the green fuel because of its lead and sulphur free character, CNG reduces harmful emissions. ... • Safe Fuel. The properties of CNG make it a safe fuel. ... • High auto ignition temperature. ... • Low operational cost. ... • Dual facility. ... • Increased life of oils. Any three relevant points can be given marks. **OR** Coal tar is widely used to manufacture paints, perfumes, synthetic dyes, photographic material, drugs and explosives. It can be utilized to make insecticides and pesticides. Naphthalene balls that are commonly used to keep moths away are made from tar.	3
16	No, their formation is a slow process and conditions for their formation cannot be created in the laboratory.	3
	SECTION D	
17	(a). Energy resources like coal, oil, and natural gas can cause pollution and medical complications. Conservation of energy ensures less carbon footprint and hence less pollution. Energy conservation minimizes carbon dioxide emissions into the atmosphere, lowering the chances of global warming. Any other relevant points can be considered. (3m) (b). Any relevant alternate source of energies like wind, solar etc. can be given marks. (2m)	5
18	(a). Any 3 relevant points can be given marks. (3m) **OR**	5

	Marks can be allotted if formation of events is mentioned properly. (2m)	
	SECTION E	
19	(a) 90 percent(1m) (b) No, because only 2 percent of the renewable resources were used. (1m) (c)Coal, petroleum and natural gas(1m) (d) Natural gas(1m)	4
20	(a) They are in unlimited supply. Sunlight and air are examples of inexhaustible natural resources. They will not get depleted with use. We can continue to utilize energy from the sun until the sun exists. more installation of the solar station /panel. Any other relevant answer may be awarded marks. (1m) (b) Over millions of years, heat and pressure from Earth's crust decomposed these organisms into one of the three main kinds of fuel: oil (also called petroleum), natural gas, or coal. These fuels are called fossil fuels, since they are formed from the remains of dead animals and plants. (2m) (c) Exhaustible natural resource(1m)	4

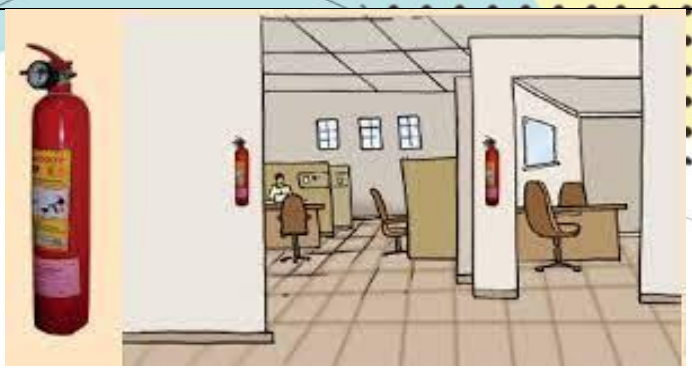
CHAPTER 4- Combustion and Flame

Q NO	SECTION A	MARKS
1	Fuels which are used for running vehicles? a. CNG b. Petrol c. Both (a) and (b) d. wood	1
2	Which of the following is the inexhaustible natural resource? a. Coal b. Petrol c. Diesel d. Sunlight	1
3	Which of the following are the non-combustible substances? a. Stone b. Wood c. Iron nail d. (a) and (c)	1
4	Spontaneous combustion is a. Substances burn rapidly to produce heat and light. b. Substances burst into flames, without the application of any apparent cause. c. Substances burn with heat and light forming large amounts of gas. d. Substances burn with the lowest temperature.	1
5	Substances that have very low ignition temperature are called a. Flammable substances b. Inflammable substances c. Non- combustible substances d. None of the above	1
6	Which of the following can take place if pressure is applied on the cracker? a. Combustion b. Rapid Combustion c. Explosion d. Spontaneous combustion	1
7	**Assertion-** Combustible substances are magnesium and charcoal. **Reason-** heat and light evolved after the process of chemical reaction between combustible substances and oxygen. a. Assertion and reason both are correct statements and reason is correct explanation for assertion. b. Assertion and reason both are correct statements and reason is not correct explanation for assertion. **c.** Assertion is a correct statement but reason is wrong statement. d. Assertion is a wrong statement but reason is correct statement.	1

<table>
<tr><td>8</td><td>Assertion – water can be used to control fire equipment or oil.
Reason- water is commonly used to control fire.
a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements and reason is not correct explanation for assertion.
c. Assertion is a correct statement but reason is wrong statement.
d. Assertion is a wrong statement but reason is correct.</td><td>1</td></tr>
<tr><td></td><td>SECTION B</td><td></td></tr>
<tr><td>9</td><td>Define inflammable substances. Give two examples.</td><td>2</td></tr>
<tr><td>10</td><td>Name two oxides produced by the burning of coal.</td><td>2</td></tr>
<tr><td>11</td><td>Why is it difficult to burn some substances whereas some substances catch fire easily?</td><td>2</td></tr>
<tr><td>12</td><td>What type of fire extinguishers are used at airports and petrol pumps?</td><td>2</td></tr>
<tr><td>13</td><td>Find combustible and non- combustible substances from the table given below.
<table>
<tr><td>S. No</td><td>Material</td><td>Combustible</td><td>Non- combustible</td></tr>
<tr><td>1</td><td>Wood</td><td></td><td></td></tr>
<tr><td>2</td><td>Stone</td><td></td><td></td></tr>
<tr><td>3</td><td>Paper</td><td></td><td></td></tr>
<tr><td>4</td><td>Glass</td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td> 

https://images.app.goo.gl/5XXqFeJyDE8VfuAk7
Label the different zones of candle flame in above diagram.</td><td>3</td></tr>
<tr><td>15</td><td>Give two examples of each fuel given in the following table.
<table>
<tr><td>S. No</td><td>Fuel</td><td>Examples</td></tr>
<tr><td>1</td><td>Solid fuel</td><td>(a)
(b)</td></tr>
<tr><td>2</td><td>Liquid fuel</td><td>(a)
(b)</td></tr>
<tr><td>3</td><td>Gaseous fuel</td><td>(a)
(b)</td></tr>
</table></td><td>3</td></tr>
<tr><td>16</td><td>Write any three Characteristics of ideal fuel.</td><td>3</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
</table>

<table>
<tr><td>17</td><td>What is acid rain? How is it harmful to human beings as well as plants and animals on the land?</td><td>5</td></tr>
<tr><td>18</td><td>Talk to people who use LPG at home. Find out what precautions they take in using LPG. Write any five precautions.</td><td>5</td></tr>
<tr><td></td><td>SECTION E</td><td></td></tr>
<tr><td>19</td><td>Calorific value is the amount of heat energy released during the complete combustion of a unit mass of fuel. It is expressed in kJ/kg. What conclusion you will draw from the following data.
<table>
<tr><th>S. No</th><th>Fuel</th><th>Calorific Value (kJ/kg)</th></tr>
<tr><td>1.</td><td>Cow dung cake</td><td>6000-8000</td></tr>
<tr><td>2.</td><td>Wood</td><td>17000-22000</td></tr>
<tr><td>3.</td><td>Coal</td><td>25000-33000</td></tr>
<tr><td>4.</td><td>Petrol</td><td>45000</td></tr>
<tr><td>5.</td><td>Kerosene</td><td>45000</td></tr>
<tr><td>6.</td><td>Diesel</td><td>45000</td></tr>
<tr><td>7.</td><td>Methane</td><td>50000</td></tr>
<tr><td>3.</td><td>CNG</td><td>50000</td></tr>
<tr><td>9.</td><td>LPG</td><td>55000</td></tr>
<tr><td>10.</td><td>Biogas</td><td>35000-40000</td></tr>
<tr><td>11.</td><td>Hydrogen</td><td>150000</td></tr>
</table>
Answer the following questions below.
1. Which of the fuel above mentioned table has highest calorific value?
2. Which of the fuel above mentioned table has least calorific value?
3. Find the calorific value of petrol, if 90,000 kJ heat was produced after it completely burnt.
4. What is fuel efficiency?</td><td>4</td></tr>
<tr><td>20</td><td>The most common fire extinguisher is water. But water works only when things like wood and paper are on fire. If electrical equipment is on fire, water may conduct electricity and harm those trying to douse the fire. Water is also not suitable for fires involving oil and petrol. Do you recall that water is heavier than oil? So, it sinks below the oil, and oil keeps burning on the top. For fires involving electrical equipment and inflammable materials like petrol, carbon dioxide (CO2) is the best extinguisher. CO2, being heavier than oxygen, covers the fire like a blanket. Since the contact between the fuel and oxygen is cut off, the fire is controlled. The added advantage of CO2 is that in most cases it does not harm the electrical equipment. How do we get the supply of carbon dioxide? It can be stored at high pressure as a liquid in cylinders. In what form is the LPG stored in cylinders? When released from the cylinder, CO2 expands enormously in volume and cools down. So, it not only forms a blanket around the fire, it also brings down the temperature of the fuel. That is why it is an excellent fire extinguisher. Another way to get CO2 is to release a lot of dry powder of chemicals like sodium bicarbonate (baking soda) or potassium bicarbonate. Near the fire, these chemicals give off CO2</td><td>4</td></tr>
</table>

	 https://images.app.goo.gl/TVoHPm3uhZCuCTQ56	
	1. LPG stands for. 2. How do we extinguish fire when things like wood and paper are on fire? 3. Why do we not use water to control fire involving electrical equipment? 4. Why do we use CO2 as fire extinguisher fire involving electrical equipment and inflammable materials?	

ANSWER KEY (CHAPTER 4- Combustion and Flame)

<table>
<tr><th>Q NO</th><th>SECTION A</th><th>MARKS</th></tr>
<tr><td>1</td><td>(b)</td><td>1</td></tr>
<tr><td>2</td><td>(b)</td><td>1</td></tr>
<tr><td>3</td><td>(d)</td><td>1</td></tr>
<tr><td>4</td><td>(b)</td><td>1</td></tr>
<tr><td>5</td><td>(b)</td><td>1</td></tr>
<tr><td>6</td><td>(c)</td><td>1</td></tr>
<tr><td>7</td><td>(a)</td><td>1</td></tr>
<tr><td>8</td><td>(d)</td><td>1</td></tr>
<tr><td></td><td>SECTION B</td><td></td></tr>
<tr><td>9</td><td>The substances which have very low ignition temperature and can easily catch fire with a flame are called inflammable substances.</td><td>2</td></tr>
<tr><td>10</td><td>Oxides of sulphur and nitrogen, SO2 and NO2</td><td>2</td></tr>
<tr><td>11</td><td>Substances which have very low ignition temperature catch fire easily and have high ignition temperature are difficult to burn.</td><td>2</td></tr>
<tr><td>12</td><td>A foam fire extinguisher puts out fires by covering the flames with a thick blanket of foam.. CO2 fire extinguisher</td><td>2</td></tr>
<tr><td>13</td><td><table><tr><td>S. No</td><td>Material</td><td>Combustible</td><td>Non- combustible</td></tr><tr><td>1</td><td>Wood</td><td>Yes</td><td>No</td></tr><tr><td>2</td><td>Stone</td><td>No</td><td>Yes</td></tr><tr><td>3</td><td>Paper</td><td>Yes</td><td>No</td></tr><tr><td>4</td><td>Glass</td><td>No</td><td>Yes</td></tr></table></td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td>. Hottest Part
A. Moderately Hot
B. Least Hot</td><td>3</td></tr>
<tr><td>15</td><td><table><tr><td>S. No</td><td>Fuel</td><td>Examples</td></tr><tr><td>1</td><td>Solid fuel</td><td>(a) Wood and
(b) Coal</td></tr><tr><td>2</td><td>Liquid fuel</td><td>(a) Petrol
(b) Diesel</td></tr><tr><td>3</td><td>Gaseous fuel</td><td>(a) LPG
(b) CNG</td></tr></table></td><td>3</td></tr>
<tr><td>16</td><td>Three Characteristics of ideal fuel
1. Easy to burn
2. High calorific value
3. Easy to store etc.</td><td>3</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td>17</td><td>Oxides of sulphur and nitrogen dissolve in rain water and form acids. Such rain is called acid rain after burning of coal, diesel and petrol.
Effects on plants and animals- adverse effect on plants in animals it leads to many skin diseases like allergy and skin cancer etc. Animals living in</td><td>5</td></tr>
</table>

	water may cause death. Old monuments and buildings also get affected by acid rain.	
18	Precautions taking in using LPG at homes 1. Cleaning the gas burner regularly and properly. 2. Changing the delivery pipe regularly. 3. Making use of strong delivery pipes. 4. Check-up of related appliances at regular intervals. 5. Keep safe storing places. 6. Always keep sufficient distance between gas stove and LPG cylinder etc	5
	SECTION E	
19	1. Hydrogen has highest calorific value 2. Cow dung cake 3. Mass of fuel= Mass of heat released/calorific value 90000/45000= 2 kg	4
20	1. Liquefied Petroleum Gas 2. Water we use when things like wood and paper are on fire. 3. Water may conduct electricity and harm those trying to douse the fire 4. Carbon dioxide (CO_2) is the best extinguisher. CO_2, being heavier than oxygen, covers the fire like a blanket. Since the contact between the fuel and oxygen is cut off, the fire is controlled.	4

CHAPTER 5- Conservation of plants and animals

Q NO	SECTION A	MARKS
1	Fertile land convert into deserts is known as (a) deforestation (b) desertification (c) conservation (d) none of these.	1
2	The national park in Uttarakhand is (a) Bandipur national park (b) Kaziranga national park (c) Jim Corbett national park (d) Satpura national park	1
3	When no member of a species exists, it is known as (a) endemic species (b) endangered species (c) extinct (d) vulnerable species.	1
4	A species found only in one particular place is known as (a) endemic (b) vulnerable (c) endangered (d) extinct.	1
5	How many Biosphere Reserves in India has the Indian Government established? (a) 20 (b) 5 (c) 10 (d) 14	1
6	The variety of life on the earth is commonly referred to as (a) biodiversity (b) biosphere (c) afforestation (d) none of these.	1
7	**Assertion –** Protected areas for flora and fauna are called sanctuaries, national parks and biosphere reserves. **Reason-**These protected areas have similar nature and habitat for flora and fauna. a) Assertion and reason both are correct statement and reason is correct explanation for assertion. b) Assertion and reason both are correct statement and reason is not correct explanation for assertion. c) Assertion is correct statement but reason is wrong statement. d) Assertion is wrong statement but reason is correct statement.	1
8	**Assertion –** the endangered species are those which are facing the danger of extinction. **Reason-** the Red data book contains a record of endangered species. a) Assertion and reason both are correct statement and reason is correct explanation for assertion.	1

<table>
<tr><td></td><td>b) Assertion and reason both are correct statement and reason is not correct explanation for assertion.
c) Assertion is a correct statement but reason is wrong statement.
d) Assertion is a wrong statement but reason is correct statement.</td><td></td></tr>
<tr><td></td><td>SECTION B</td><td></td></tr>
<tr><td>9</td><td>Why should paper be recycled?</td><td>2</td></tr>
<tr><td>10</td><td>Name two wildlife sanctuaries present in your state.</td><td>2</td></tr>
<tr><td>11</td><td>Give a comparison between wildlife sanctuaries and national park.</td><td>2</td></tr>
<tr><td>12</td><td>Describe causes of deforestation, drought and desertification.</td><td>2</td></tr>
<tr><td>13</td><td>Explain how deforestation is associated with global warming.</td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td>Write at least two names of the following species in the table given below.
<table>
<tr><td>S.No</td><td>Species</td><td>Plants and animals</td></tr>
<tr><td>1</td><td>Endangered species</td><td>(a)
(b)</td></tr>
<tr><td>2</td><td>Endemic species</td><td>(a)
(b)</td></tr>
<tr><td>3</td><td>Extinct species</td><td>(a)
(b)</td></tr>
</table></td><td>3</td></tr>
<tr><td>15</td><td>Define the term
. Red Data Book
a. Migration
b. Reforestation</td><td>3</td></tr>
<tr><td>16</td><td>What is the ecosystem? Write the components of the ecosystem with examples.</td><td>3</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td>17</td><td>Find out about any five national parks in different parts of your country and locate them in the outline map of your country India.
 
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Attribution-ShareAlike 3.0 Unported</td><td>5</td></tr>
</table>

18 Write the national parks, wild life sanctuaries and biosphere reserve in the states mentioned in the table below. 5

S. No	State	National Park	Wildlife sanctuary	Biosphere reserve
1	Karnataka			
2	Andhra Pradesh			
3	Madhya Pradesh			
4	Assam			
5	Uttarakhand			

SECTION E

19 **Read the passage and answer the question given below.** 4

A great variety of plants and animals exist on earth. They are essential for the well-being and survival of mankind. To preserve biodiversity, to prevent extinction of endangered species, and to maintain ecological balance in nature, wildlife and forests should be conserved. Habitat is a place in the environment where an organism lives. Today, a major threat to survival of these organisms is deforestation. We know that deforestation means clearing of forests and using that land for other purposes. Trees in the forest are cut for many purposes. Some natural causes of deforestation are forest fires and severe droughts. The answer to deforestation is reforestation. Reforestation is restocking of the destroyed forests by planting new trees. The planted trees should generally be of the same species which were found in that forest. We should plant at least as many trees as we cut. Reforestation can take place naturally also.

i) Name the place in the environment where organisms live.

ii) Why should Wildlife and forests be conserved:.

iii) Any two causes of deforestation

iv) Restocking of the destroyed forests known as

20 **Read the passage and answer the question given below.** 4

Professor Ahmad explains about Red Data Book to the children. He tells them that the Red Data Book is the source book which keeps a record of all the endangered animals and plants. Red Data Book is maintained internationally by an organisation. India also maintains Red Data Book for plants and animals found in India. The excursion party then enters deeper into the forest under the guidance of Madhavji. They sit near the Tawa Reservoir to relax for some time. Paheli observes some of the birds near the river. Madhavji tells the children that these are migratory birds. These birds have flown here from other parts of the world. Migratory birds fly to far away areas every year during a particular time because of climatic changes. They fly for laying eggs as the weather in their natural habitat becomes very cold and inhospitable. Birds who cover long distances to reach another land are known as migratory birds. Professor Ahmad draws attention of the children to another cause of deforestation. He tells them that it takes 17 full grown trees to make one tonne of paper. Therefore, we should save paper. Professor Ahmad also says that paper can be recycled five to seven times for use. If each student saves at least one sheet of paper in a day, we can save many trees in a year. We should save, reuse used paper and recycle it. By this we not only save trees but also save energy and water needed for manufacturing paper. Moreover, the amount of harmful chemicals used in

	paper making will also be reduced. Professor Ahmad suggests that the answer to deforestation is reforestation. Reforestation is restocking of the destroyed forests by planting new trees. The planted trees should generally be of the same species which were found in that forest. We should plant at least as many trees as we cut. Reforestation can take place naturally also. If the deforested area is left undisturbed, it re-establishes itself. 1. Name the birds who cover long distances to reach another land. 2. By which act in India aimed at preservation and conservation of natural forests and meeting the basic needs of the people living in or near the forests. 3. Which method can we save paper? 4. What is a “red data book"?	

ANSWER KEY (CHAPTER 5- Conservation of plants and animals)

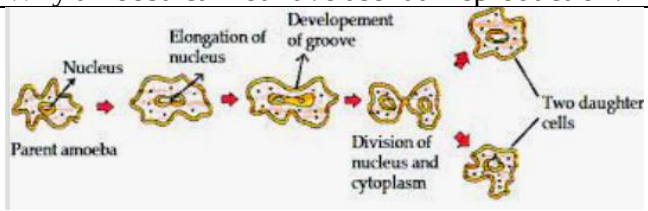
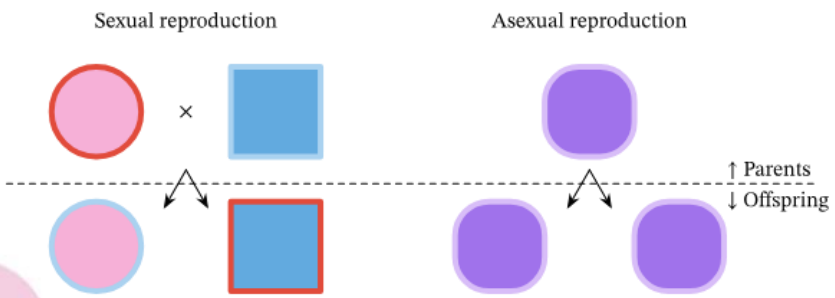
Q NO	SECTION A	MARKS
1	b	1
2	c	1
3	c	1
4	a	1
5	d	1
6	a	1
7	b	1
8	a	1
	SECTION B	
9	It causes unchecked deforestation by reducing forest cover. It leads to the loss of natural flora and fauna. It eventually will lead to decreased oxygen in the environment which will affect all the organisms and the environment. Hence, we should save paper.	2
10	According to state two wildlife sanctuaries for example U.P a- Katarniaghat Sanctuary b- Hastinapur Sanctuary	2
11	**Wildlife Sanctuary**: Areas where animals are protected from any disturbance to them and their habitat. **National Park**: Areas reserved for wild life where they can freely use the habitats and natural resources.	2
12	**Droughts** can be triggered by natural causes such as weather patterns. But increasingly they are caused by human activity like deforestation. forests are cut for some of the purposes mentioned below: l Procuring land for	2

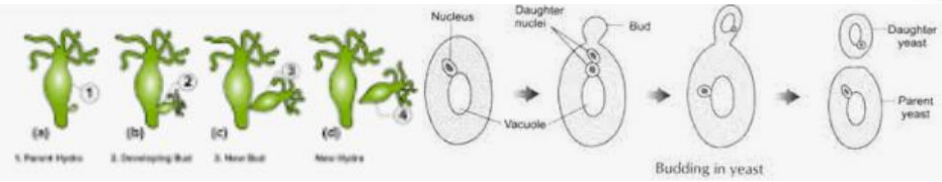
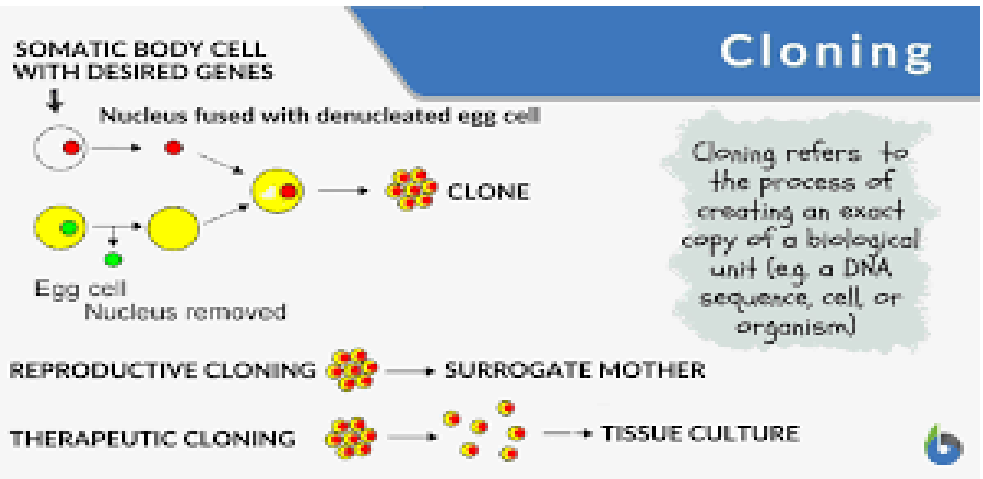
<table>
<tr><td></td><td>cultivation. l Building houses and factories. l Making furniture or using wood as fuel. This leads to drought
Removal of the top layer of the soil exposes the lower, hard and rocky layers. This soil has less humus and is less fertile. Gradually the fertile land gets converted into deserts. It is called desertification.</td><td></td></tr>
<tr><td>13</td><td>When forests are cut down, much of that stored carbon is released into the atmosphere again as carbon dioxide (CO_2). This is how deforestation and forest degradation contribute to global warming.</td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td><table>
<tr><td>S.No</td><td>Species</td><td>Plants and animals</td></tr>
<tr><td>1</td><td>Endangered species</td><td>(a)Wild buffalo
(b)Barasingha</td></tr>
<tr><td>2</td><td>Endemic species</td><td>(a)Sal Plant
(b)Flying squirrel</td></tr>
<tr><td>3</td><td>Extinct species</td><td>(a)Dinosaur
(b)Mammoth</td></tr>
</table></td><td>3</td></tr>
<tr><td>15</td><td>. Red Data Book- Is the source book which keeps a record of all the endangered animals and plants.
a. Migration-Migratory birds fly to far away areas every year during a particular time because of climatic changes.
b. Reforestation-Reforestation is the restocking of destroyed forests by planting new trees.</td><td>3</td></tr>
<tr><td>16</td><td>Interaction between plants, animals and microorganisms (Biotic components) with water, soil, air and sunlight (abiotic components) in an area is called ecosystem.
Ecosystem has two components
Biotic components plants and animals
Abiotic components Water and sunlight</td><td>3</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td>17</td><td>ANY FIVE NATIONAL PARKS IN INDIA</td><td>5</td></tr>
<tr><td>18</td><td>Write the national parks, wild life sanctuaries and biosphere reserve in the states mentioned in the table below.<table>
<tr><td>S. No</td><td>State</td><td>National Park</td><td>Wildlife sanctuary</td><td>Biosphere reserve</td></tr>
<tr><td>1</td><td>Karnataka</td><td>Bandipur</td><td>Kaveri wildlife sanctuaries</td><td>Nilgiri biosphere reserve</td></tr>
<tr><td>2</td><td>Andhra Pradesh</td><td>PapiKonda National Park</td><td>Sri Venkateswara Wildlife Sanctuary</td><td>Seshachalam</td></tr>
<tr><td>3</td><td>Madhya Pradesh</td><td>Kanha National park</td><td>Nauradehi Wildlife Sanctuary</td><td>Satpura tiger reserve</td></tr>
<tr><td>4</td><td>Assam</td><td>Kagiranga national park</td><td>Assam Garampani Wildlife Sanctuary</td><td>Manas</td></tr>
</table></td><td>5</td></tr>
</table>

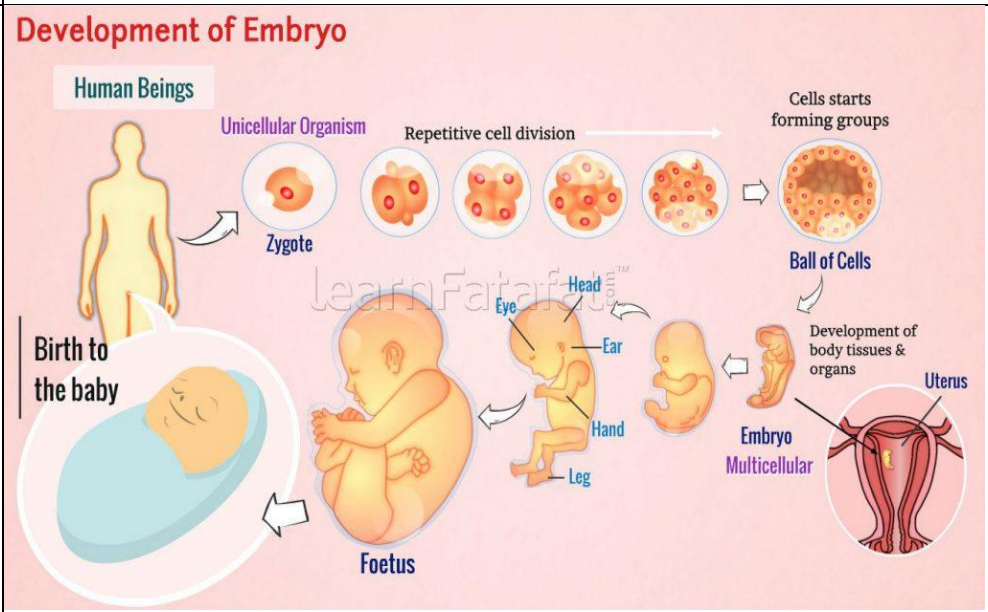
	5	Uttarakhand	Corbett national park	Kedarnath wildlife sanctuary	Sonanadi Biosphere reserve	
	SECTION E					
19	. Habitat a. To preserve biodiversity. To prevent extinction of endangered species. Maintain ecological balance in nature. c. Cutting trees use forest land for many purposes(agriculture, construction) . Reforestation					4
20	. Migratory bird a. forest act b. recycling c. Keeping the records of all endangered plants and animals					4

CHAPTER- 6 : REPRODUCTION IN ANIMALS

Q NO	SECTION A	MARKS
1	Which part of the female reproductive system involves in the development of embryo? a. Oviduct b. Uterus c. Ovary d. Ovum	1
2	Which of the following statements is **correct** about Viviparous organisms? a. Such organisms lay eggs in water. b. Such organisms lay eggs and has internal fertilization. c. Such organisms give birth to young ones. d. Such organisms lay eggs and has external fertilization.	1
3	From the following organisms which one does not involve in the metamorphosis process? a. Frog b. Mouse c. Mosquito d. Silkworm	1
4	Which of the following statements is incorrect about asexual reproduction? a. A single parent is involved. b. This process of reproduction occurs in a short time. c. Fertilisation or gamete formation takes place. d. The offspring is genetically similar.	1
5	The hen is odd in the list of animals given below. (human beings, cows, dogs, hens). The reason for it is a. it undergoes internal fertilisation. b. It is oviparous. c. It is viviparous. d. It undergoes external fertilisation.	1
6	 What will you call this process? a. Development of embryo b. Fertilization c. Formation of fetus d. Metamorphosis	1

7	**Assertion-** Number of male gametes produced by terrestrial animals are larger than female gametes. **Reason-** External fertilization takes place in some of the terrestrial animals. a. Assertion and Reason are true and the Reason is the correct explanation of the Assertion. b) Assertion and Reason are true but the Reason is NOT the correct explanation of the Assertion. c) Assertion is true, but the Reason is false. d) Assertion is false, but the Reason is true.	1
8	**Assertion-** Testis in males always present outside the body. **Reason-** Formation of sperm requires lower temperature than the body. a. Assertion and Reason are true and the Reason is the correct explanation of the Assertion. b) Assertion and Reason are true but the Reason is NOT the correct explanation of the Assertion. c) Assertion is true, but the Reason is false. d) Assertion is false, but the Reason is true.	1
	SECTION B	
9	Why amoeba cannot have asexual reproduction?	2
10	 Identify the process shown in the figure and justify why is it named so?	2
11	What could be the possibilities if a frog lays eggs on land?	2
12	An organ named A**,** is a part of the female reproductive system involved in very important functions such as fertilization and transportation of ovum to the **B.** Identify the **A** and **B.**	2
13	What differences do you find in organisms performing internal fertilization and external fertilization?	2
	SECTION C	
14		3

	Understand the concept given in the figure and answer why daughter cell of amoeba remain similar to the parent but offspring of human beings results different from the parent.	
15	Write any 3 differences between oviparous and viviparous.	3
16	 Observe both the figures and answer what difference you find in budding in hydra and budding in yeast.	3
	SECTION D	
17	Ram with his family went to a picnic spot near a pond. He saw some jelly-like mass floating on the sides of the pond. He asked about this to his father. His father explained to him that these are frog's eggs and are millions in number. Ram wondered if all of them get hatched, what will happen to other aquatic animals? . What type of fertilisation is shown by frogs? a. Why do frogs lay eggs in large amounts? b. Is Ram's concern about hatching of too many eggs at a time will affect the aquatic animals correct? Why? c. What Value of Ram is shown here?	5
18	Draw a flow chart to summarize the Human reproductive system. Note: Take the following terms as key points to draw. . Pre-fertilization (formation of gamete) a. Fertilization, (if fertilized or not) b. Post-fertilization.	5
	SECTION E	
19	 https://images.app.goo.gl/EerXZNczAaw6uBgX9	4

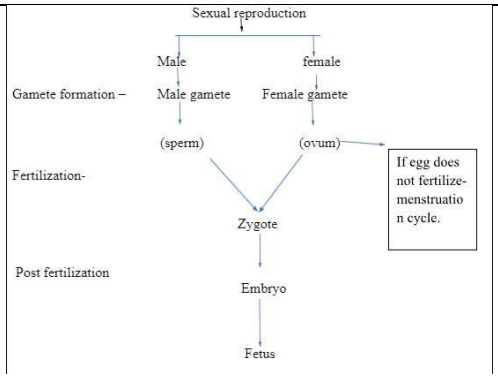
	Cloning is a technique scientist use to make exact genetic copies of living things. Genes, cells, tissues, and even whole animals can all be cloned. Some clones already exist in nature. Single-celled organisms like bacteria make exact copies of themselves each time they reproduce. In humans, identical twins are similar to clones. They share almost the exact same genes. Identical twins are created when a fertilized egg split in two. . Do you think kittens are clones of their parents (cats)? Justify your answer? i. Write any two examples in which organisms reproduce their clones. ii. What differences do you find in inheritance of characteristics from parents of an asexual reproduction and sexual reproduction?	
20	 https://images.app.goo.gl/He8Yn7TSKYWwG3TV7 Foetal development is an orderly and intricate process. It begins before you even know you're pregnant and ends with the birth of your baby. Between conception and delivery, there are many detailed steps that have to occur. There are three stages of foetal development: germinal, embryonic and foetal. **Germinal stage** The germinal stage is the shortest stage of foetal development. It begins at conception when a sperm and egg join in your fallopian tube. The sperm fertilizes the egg and creates a zygote. **Embryonic stage** The embryonic stage lasts from about the third week of pregnancy until the eighth week of pregnancy. The blastocyst begins to take on distinct human characteristics. It's now called an embryo. Structures and organs like the neural tube (which later becomes the brain and spinal cord), head, eyes, mouth and limbs form. The embryo's heart begins to develop and pulse around the sixth week. Buds that will become arms and legs also form around the sixth week. **Foetal stage**	4

	The foetal stage of development begins around the ninth week and lasts until birth. This is when the embryo officially turns into a foetus. The foetus gets its assigned sex around nine weeks of pregnancy, although your healthcare provider can't detect it on ultrasound yet. . Where does the fertilization of male and female gametes take place in the human reproductive system? i. Which method is used to check the developmental stage of an embryo? ii. What is the difference between germinal stage and fetal stage? iii. Why a male can not give birth to a child?	

ANSWER KEY CHAPTER- 6 : Reproduction in animals

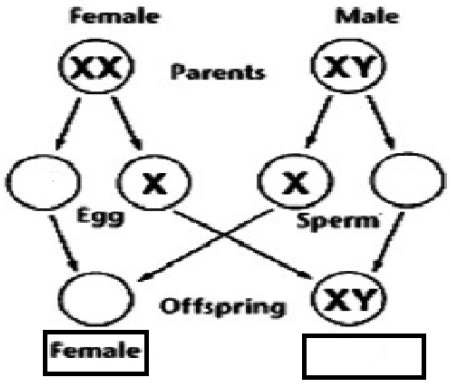
Q NO	SECTION A	MARKS
1	b)	1
2	c)	1
3	b)	1
4	c)	1
5	b)	1
6	d)	1
7	b)	1
8	a)	1
	SECTION B	

<table>
<tr><td>9</td><td>Amoeba is unicellular organism and does not have organs to produce gametes for fertilization</td><td>2</td></tr>
<tr><td>10</td><td>Given diagram shows Binary fission in amoeba. It is named as binary fission because the amoeba is divided into two daughter cells. (Binary – Two, Fission - division)</td><td>2</td></tr>
<tr><td>11</td><td>Eggs of frogs are delicate in nature because they do not have a protective layer. If frogs lay their eggs on the land it may be damaged by high temperature and air. Male gametes of frogs swim to the eggs with the help of water if it will be laid on land fertilization will not take place.</td><td>1 + 1</td></tr>
<tr><td>12</td><td>A – Oviduct, B - Uterus</td><td>1 + 1</td></tr>
<tr><td>13</td><td><table>
<tr><th>EXTERNAL FERTILIZATION</th><th>INTERNAL FERTILIZATION</th></tr>
<tr><td>Takes place outside the female’s body.</td><td>Takes place inside the female’s body.</td></tr>
<tr><td>Usually, a large number of gametes are released in the surrounding medium (for example water).</td><td>Male gametes are released inside the body of the female by a copulatory organ.</td></tr>
<tr><td>Organisms that use external fertilization to reproduce must either live in the water or return to the water for reproduction.</td><td>Animals that have internal fertilization have completely transitioned to life on land.</td></tr>
<tr><td>As the chance of fertilization in water is generally less, hence, a large number of gametes are released.</td><td>The number of gametes produced in this mode is relatively less.</td></tr>
</table></td><td>1 m for each point (any)</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td>In sexual reproduction a child is getting genes from two different parents but in asexual reproduction a single parent is transferring characters.</td><td>3</td></tr>
<tr><td>15</td><td><table>
<tr><td></td><td>Oviparous</td><td>Viviparous</td></tr>
<tr><td>1</td><td>Females lay eggs outside the body.</td><td>Females give birth to young ones.</td></tr>
<tr><td>2</td><td>Fertilization can be external or internal.</td><td>Fertilization always internal</td></tr>
<tr><td>3</td><td>Egg contains yolk, albumin and essential supplements for the proper development of the young one.</td><td>The foetus obtains nourishment inside the female body through the food reserves of the female.</td></tr>
</table></td><td>1+1+1</td></tr>
<tr><td>16</td><td><table>
<tr><td>S. No.</td><td>Budding in yeast</td><td>budding in Hydra</td></tr>
<tr><td>1</td><td>Bud in Yeast is unicellular</td><td>Bud in Hydra is a multicellular</td></tr>
<tr><td>2</td><td>Bud originates from a small protuberance on the parent body</td><td>Bud arises due to the repeated mitotic division</td></tr>
</table></td><td>1+1+1</td></tr>
</table>

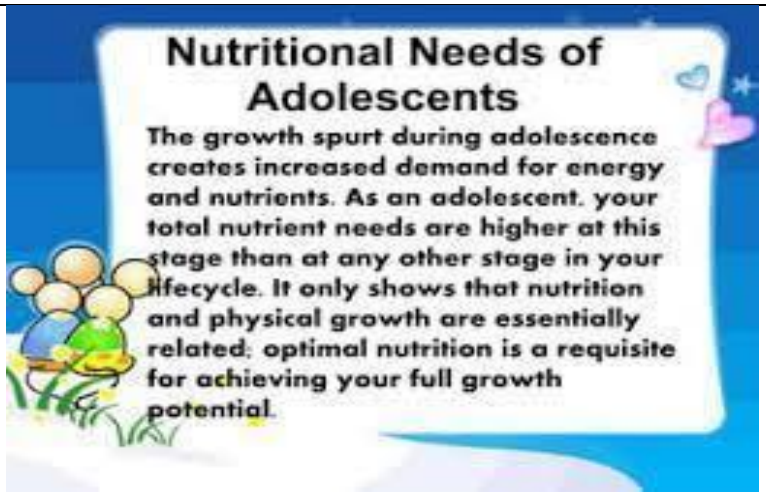
	3	Yeast gets its daughter nuclei and it may or may not separate from the parent body	In Hydra the daughter buds are multicellular and there is no development of daughter buds	
	SECTION D			
17	. Frog shows external fertilization. a. Mortality rate is very high for tadpoles as their predators are more. Many of the eggs do not develop due to not being fertilized. So for the continuation of their species, they lay eggs in large numbers. b. No, his concern is not correct because most of the eggs either never develop or are preyed by other animals. So the survival chance of a frog from its egg to an adult frog is very low. c. Ram is inquisitive, future thinker and eco-concerned.			1+2+1+1
18				5
	SECTION E			
19	. NO, because kitten is produced by sexual reproduction. i. Binary fission in amoeba, Budding in hydra ii. Children produced through asexual reproduction are identical to their parents as they inherit all characters from them but children produced through sexual reproduction are different from parents as they are inheriting from both the parents.			1+1+2
20	. Oviduct i. Ultrasound ii. Germinal stage has cellular level of organization and foetus has organ level of organization. iii. Male does not have a uterus to develop an embryo.			1+1+1+1

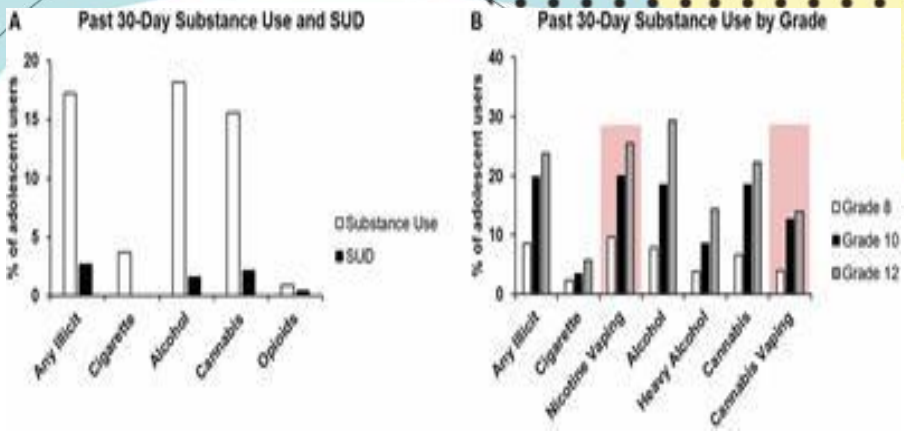
CHAPTER 7- Reaching the age of adolescence

Q NO	SECTION A	MARKS
1	Period of adolescence in girls lies on which age difference? a. 14 years to 20 years b. 11 years to 19 years c. 19 years to 25 years d. 11 years till death	1
2	Why does a boy of age 15 years' experience more sweating than the boy with age 5 during playing? a. Due to increased physical activity b. Due to increased activity of sweat gland c. Due to increased height d. Due to increased age	1
3	Which of the following is male gonads? (a) Moustache (b) Chest (c) Testes (d) Hair	1
4	The unfertilised egg always has _____ chromosome. a. Y b. X c. XY d. XX	1
5	Pimples appeared during adolescence as an indication for which of the following activities? a. Due to increased physical activity b. Due to increased activity of oil gland c. Due to increased height d. Due to increased age	1
6	Mark the incorrect statement about onset of puberty in males. a. sudden increase in height. b. growth of hair at different parts of the body like face, armpit and pubic region, development of moustache and beard. c. development of Adam's apple in throat, voice becomes hoarse shoulders become broader and chest wider. d. ovaries get enlarged and begin producing eggs	1
7	If a sperm carrying 0 chromosomes (NO CHROMOSOME) fertilizes with the ovum, what will be the sex of the child? a. Girl b. Boy c. Transgender d. Bisexual	1

8	Which of the following determines the sex of the baby? (a) Chromosomes (b) Chloroplast (c) Hormones (d) Pituitary gland	1
	SECTION B	
9	Calculate approximal height of a boy whose height is 162 cm at the age of 14 years. (Note: % of full height for 14 year of boys – 92%)	2
10	A person is suffering from dysfunctional pancreas. What medical ailments is the person likely to suffer?	2
11	 Which hormone will be released in such a situation? What will happen if an organ fails in releasing that hormone?	2
12	A person observed a number of tadpoles in a small water body. After 4 months he observed that it still remains in the same stage (tadpoles). What could be the reason for the lack of growth in tadpoles?	2
13	Complete the flowchart of sex determination-  	2
	SECTION C	
14	What is the age group for menstruation cycle in females? Is it possible for a lady to be naturally pregnant after 65 years? Justify your answer.	3
15	Complete the table-	3

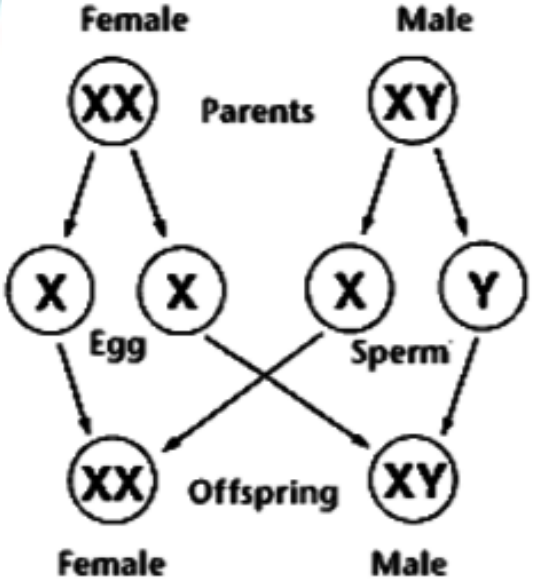
s. no.	Name of gland	Hormone released	Function
1	Pancreas		

	2		Adrenaline		
	3			Breast development	
16	If a person calls you from outside your home, how will you be able to tell that person is male or female without watching? Mention if there any other criteria by which we can differentiate between male and female?				3
	SECTION D				
17	Draft a notice by using sub points given below to display in your classroom to create awareness regarding personal hygiene. [Personal hygiene- * importance of personal hygiene, * steps to clean yourself, * routine to be followed, etc.]				5
18	A doctor faced a patient who was complaining about sperm formation. When the doctor checked he found that everything was properly functioning. Help them to find out the problem by answering some questions. I. Which organ doctor would have examined for sperm formation? II. What could be the problem if organ releasing sperm is alright? III. How will this problem affect a person's life in future?				5
	SECTION E				
19	 https://images.app.goo.gl/ZtRCo77D7a4tcnyYA Read the paragraph given in the picture and answer the following question with your understanding- I. Why are nutritional needs higher at adolescence? II. Which type of food should we take during adolescence? III. Does nutrition have any effect on our growth? Explain. IV. How will you make friends aware about good food and good health?				4

20	 Observe the graph given here and answer the following- I. Which grade of students are using more alcohol? II. Why does the usage of substances slightly increase with the grade? III. What effect can be seen in teenagers by consuming drugs? IV. Suggest any way by which we can reduce the level of consuming drugs.	4

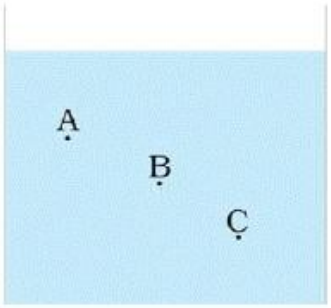
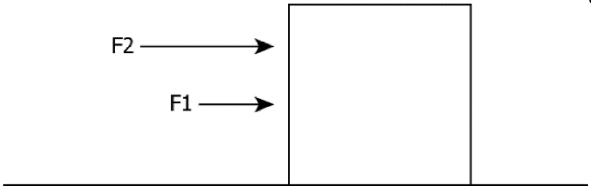
ANSWER KEY (CHAPTER 7- Reaching the age of adolescence)

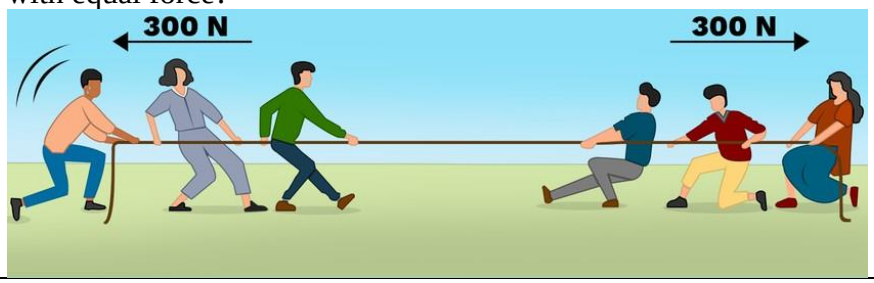
Q NO	SECTION A	MARKS
1	b)	1
2	b)	1
3	c)	1
4	b)	1
5	b)	1
6	d)	1
7	a)	1
8	a)	1
	SECTION B	
9	Calculation for full height = Present height / % of full height at this age x 100 = 162 cm / 92 x 100 176 cm	2
10	His body will not be able to secrete insulin and will have diabetes.	2
11	Adrenaline will be secreted from adrenaline. If this hormone will not be secreted then a person who does not react to the situation would have some damage.	1+1

<table>
<tr><td>12</td><td>Water could have a lack of iodine which indirectly affects the process of metamorphosis.</td><td>2</td></tr>
<tr><td>13</td><td>Complete the flowchart of sex determination-
 
</td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td>A female may have menstruation from 11 years to 50 years of age. A lady with age can not be pregnant after age of 65 because body is not producing ovum.</td><td>3</td></tr>
<tr><td>15</td><td>Complete the table-
<table>
<tr><td>s. no.</td><td>Name of gland</td><td>Hormone released</td><td>Function</td></tr>
<tr><td>1</td><td>Pancreas</td><td>Insulin</td><td>Decrease blood sugar level</td></tr>
<tr><td>2</td><td>Adrenal gland</td><td>Adrenaline</td><td>To adjust stress</td></tr>
<tr><td>3</td><td>Ovary</td><td>Estrogen</td><td>Breast development</td></tr>
</table></td><td>½+½+½+ ½+½+½</td></tr>
<tr><td>16</td><td>I will recognize her/ him because male and females differ in pitch and loudness.</td><td>1+2</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td>17</td><td></td><td>5</td></tr>
</table>

	 Any relevant notice	
18	I. Testes II. pituitary gland not releasing stimulating hormone III. He will become impotent	5
	SECTION E	
19	I. For growth and development II. Healthy and Protein rich (fruits and green vegetable) III. Yes, nutrition will help our cells to divide for growth and development IV. By sharing experiences (any suggestion)	1+1+1+1
20	I. Grade 12 II. Addiction increases during adolescence III. They can be suffered with diseases IV. By awareness	1+1+1+1

CHAPTER 8- FORCE AND PRESSURE

Q. No.	Question(s)	Marks
	SECTION A	
1.	What does the bursting of an air-filled balloon depict? (a) Gas exerts pressure on the walls of its container. (b) Liquid exerts pressure on the walls of its container. (c) Solids exert pressure. (d) All of the above.	1m
2.	Two objects repel each other. This repulsion could be due to (a) frictional force only (b) electrostatic force only (c) magnetic force only (d) either a magnetic or an electrostatic force	1m
3.	Figure below shows a container filled with water. Which of the following statements is correct about pressure of water?  (a) Pressure at A> Pressure at B> Pressure at C (b) Pressure at A=Pressure at B=Pressure at C (c) Pressure at A< Pressure at B>Pressure at C (d) Pressure at A< Pressure at B<Pressure at C	1m
4.	A person X pushes a cart with a force. Another person Y starts pushing the cart in the opposite direction with the same force. How does it affect the cart? (a) it brings the cart to rest (b) it changes the direction of cart (c) it increases the speed of the cart (d) it will change the shape of the cart	1m
5.	The image shows a block in which force F1 and F2 are acting.  What would be the net force on the block? (a) F1 (b) F2 (c) F2 – F1 (d) F1 + F2	1m
6.	The area of a small plate is 15cm x 15cm and air in column exerts a force of 2250 N on it. How much atmospheric pressure is exerted by air? (a) N/cm^2 (b) 10 N/cm^2 (c) 15 N/cm^2 (d) 150 N/cm^2	1m
	Q.No. 7 & 8 are Assertion and Reason Type Questions. In those questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:	

	(a) If both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A). (b) If both Assertion (A) & Reason (R) are true and Reason (R) is not correct explanation of Assertion(A) (c) If Assertion (A) is true but Reason (R) is false. (d) If Assertion (A) is false but Reason (R) is true.	
7.	**Assertion**: As we move to higher altitudes, breathing can become difficult. **Reason**: At higher altitude there is decrease in the atmospheric pressure.	1m
8.	**Assertion**: Sharp knives are used to cut the vegetables. **Reason**: Sharp edges exert more pressure.	1m
9.	What happens in a tug-of-war when both the opponent teams pull the rope with equal force? 	1m
10.	Why would a porter keep a round piece of cloth over his head before carrying heavy luggage on his head? 	1m
11.	Name the forces acting on a plastic bucket containing water held above ground level in your hand.  Discuss why the forces acting on the bucket do not bring a change in its state of motion.	1m
	SECTION B	
12.	A boy having area of 70 cm sq. exerts a pressure of 7N/cm sq. on the ground. What will be the force acting on the ground ?	2m

13.	When a person stands on a cushion, the depression is much more than when he lies down on it. Explain with a reason.	2m
	SECTION C	
15.	Why do deep sea divers wear special suits while diving? 	3m
16.	Why is a heavy truck fitted with six to eight wheels? 	3m
	SECTION D	
17.	(a) How does a rubber sucker work? (2m)  (b) Why do some people suffer from nose bleeding at high altitudes? (3m)	5m
18.	(a) Reason out why skis are used to glide over snow? (2m)  (b) Why is the wall of a dam made stronger and thicker at the bottom than at the top? (3m) 	5m
	SECTION E	
	Case-Based Questions: Q.No. 17 to 18 are case-based questions. A passage is followed by four questions.	
19.	The weight of the atmosphere presses down on the earth's surface and creates pressure on it. The atmospheric pressure at a place decrease with an increase in altitude. As we go up the length of the air column above us decreases. This means that its weight and the atmospheric pressure are	4m

	smaller at higher places than at sea level. At the top of a mountain, some people can feel their ears "*popping*" due to a decrease in air pressure. (i) What is atmospheric pressure? (ii) There is a huge amount of atmospheric pressure on us.Why do our bodies not get crushed due to intense atmosphere pressure? (iii) Why do some people feel their ears "*popping*" at the top of the mountain? (iv) Which instrument measures the atmospheric pressure?	
20.	The Greeks were aware of the electric charges from 600 BC. They found that when amber (a type of resin) and fur are rubbed together, the amber can attract light objects like hair. This is because of electric charges. When two objects are rubbed together, they get charged due to the transfer of electrons between them. This transfer makes one object as positively charged and the other as negatively charged. These objects are called charged objects. The force that exists between the charged bodies is called the electrostatic force of attraction. Rubbing of clouds generate charges. These charges will neutralize by passing through the atmosphere until they reach the neutral ground. A sudden electrostatic discharge between the electrically charged regions of the cloud reaches the ground. (i) Which natural phenomenon develops by charges? (a) Earthquake (b) cyclone (c) lightning (d) tsunami (ii) The property of like charges repelling and opposite charges attracting in electrostatic force are very similar to – (a) frictional force (b) magnetic force (c) mechanical force (d) gravitational force (i) Why do grains of sugar get attracted to the inside surface of a container? (iv) How can two objects be made to attract or repel each other?	4m

ANSWER KEY (CHAPTER 8- Force and Pressure)

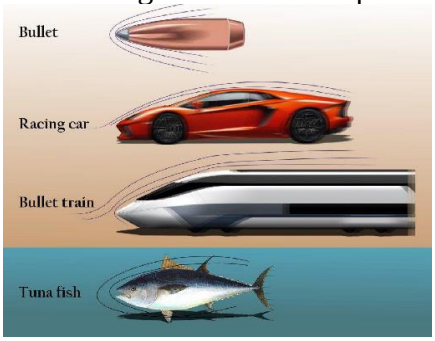
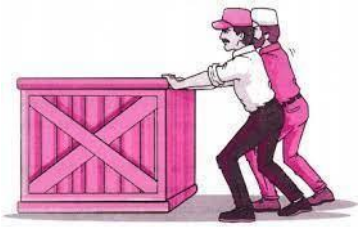
1.	(a) Gas exerts pressure on the walls of its container.	1m
2.	Two objects repel each other. This repulsion could be due to (d) either a magnetic or an electrostatic force	1m
3.	d) Pressure at A< Pressure at B<Pressure at C	1m
4.	(a) it brings the cart to rest	1m
5.	(d) F1 + F2	1m
6.	(b) 10 N/cm^2	1m
	Q.No. 7 & 8 are Assertion and Reason Type Questions. In those questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (a) If both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A). (b) If both Assertion (A) & Reason (R) are true and Reason (R) is not correct explanation of Assertion(A) (c) If Assertion (A) is true but Reason (R) is false. (d) If Assertion (A) is false but Reason (R) is true.	
7.	(a) both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).	1m
8.	(a) both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).	
9.	The rope doesn't move in any direction.	1m
10.	Pressure is inversely proportional to area. Larger the area, the lesser the pressure exerted. The porter is arranging a larger surface area by keeping a round piece of cloth over his head, so that the luggage exerts less pressure on his head.	1m
11.	(i) Muscular force of arms acting upward. (ii) Force of gravity acting downward. Both the forces are acting in equal and opposite directions with equal magnitude. Thus, they cancel each other's effect.	1m
12.	490 N	2m
13.	While standing on a cushion, only the feet are in contact with the cushion. The whole weight of the body rests on two feet which has a lesser area of contact. While lying on cushion, the entire body surface is in contact with the cushion and the entire body provides a larger surface area. So, the depression is more while standing than while resting on cushion.	2m
14.	Two forces acting on the rocket: i. Upward force applied by the rocket engine. ii. Downward gravitational force applied by the earth.	2m

15.	Liquid pressure increases with depth: Pressure is high at the bottom therefore deep sea divers have to wear special suits to protect themselves from high pressure otherwise it may crush their bodies.	3m
16.	A heavy truck is fitted with six to eight wheels because increased area reduces the pressure on wheels so they do not burst or damage on the road. That is why truck has broad tyres so that there is less pressure on the ground and the tyres do not sink in the soil.	3m
17.	(a) When we press the sucker, the air between its cup and the surface escapes out. The sucker sticks to the surface because the pressure of the atmosphere works on it. To pull the sucker out, the applied force should be large enough so as to overcome the atmospheric pressure. (2m) (b) The atmospheric pressure is at a maximum on the surface of the earth. When we go to a higher altitude (say a high mountain), then the atmospheric pressure decreases. So, at high altitudes, the atmospheric pressure becomes much less than our blood pressure. Since our blood is at a higher pressure than the outside pressure, therefore, some of the blood vessels in our body burst and nose bleeding can occur at high altitudes. (3m)	5m
18.	(a) Skis are constructed in such a way that they have a large surface area which helps to reduce the pressure on snow. This makes sure that the skis do not sink too far in the snow. (2m) (b) The wall of a dam is made stronger and thicker at the bottom than at the top so as to withstand high sideways pressure exerted by deep water stored in the reservoir of the dam. Pressure is inversely proportional to area, therefore, more the area the lesser the pressure exerted. So, high pressure exerted by dams can be borne on ground and that avoids breakage of the dam. That is the reason why dams are always constructed with a wide base. (3m)	5m
	Case-Based Questions: Q.No. 17 to 18 are case-based questions. A passage is followed by four questions.	
19.	(i) The pressure exerted by the air around us is known as atmospheric pressure. (1m) (ii) The pressure of the air inside our body is the same as that of the pressure outside. This balances the difference in pressure inside and outside the body. So, our bodies do not get crushed due to intense atmosphere pressure. (1m) (iii) Some people feel their ear-popping at the top of the mountain due to the decrease in the air pressure. The ears pop to balance the difference in pressures inside and outside of the body. (1m) (iv) Barometer measures the atmospheric pressure. (1m)	4m
20.	(i) (c) lightning (1m) (ii) (b) magnetic force (1m) (iii) Grains of sugar get attracted to the inside surface of a container due to electrostatic force of attraction. The container and the small grains have opposite charges. (1m) (iv) Two objects can be made to attract or repel each other by rubbing against each other. (1m)	4m

CHAPTER 9- FRICTION

Question Number	Question(s)	Marks
1.	Once a body starts moving on table, the friction that comes into play is: (a) static friction (b) sliding friction (c) limiting friction (d) none of these	1m
2.	Which of the following statements is incorrect? (a) Friction acts on a ball rolling along the ground (b) Friction acts on a boat moving on water (c) Friction acts on a bicycle moving on a smooth road (d) Friction does not act on a ball moving through air	1m
3.	The image shows a person rowing a boat over a river.  Identify the number of bodies experiencing friction. (a) 1, boat because of the river (b) 1, boat because of the person (c) 2, boat because of the river and the person because of air (d) 2, boat because of air and river and the person because of air	1m
4.	In a large commercial complex, there are four ways to reach the main road. One of the paths has loose soil, the second is laid with polished marble, the third is laid with bricks and the fourth has gravel surface. It is raining heavily and Priya wishes to reach the main road. The path on which she is least likely to slip is (a) loose soil. (b) polished marble. (c) bricks (d) gravel.	1m
5.	In Figure below, a boy is shown pushing the box from right to left.  The force of friction will act on the box (a) from right to left (←) (b) from left to right (→) (c) vertically downwards (↓) (d) vertically upwards (↑)	1m
6.	In a cycling race, it is observed that a racer bends his body forward.	1m

	 Why does he bend his body forward while cycling in a race? (a) to feel comfortable (b) to reduce his body weight while cycling (c) to reduce the air drag (d) to increase his energy consumption	
	Q.No.7 & 8 are Assertion-Reason type questions. In those questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (a) If both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A). (b) If both Assertion (A) & Reason (R) are true and Reason (R) is not correct explanation of Assertion(A) (c) If Assertion (A) is true but Reason (R) is false. (d) If Assertion (A) is false but Reason (R) is true.	
7.	**Assertion**: It is harder to start to slide a heavy box across the floor than to keep it sliding. **Reason**: Sliding friction is less than rolling friction.	1m
8.	**Assertion**: Rocket has a special streamlined body. **Reason**: It decreases the friction.	1m
9.	How does the friction depend on the nature of the surface?	2m
10.	Why is the surface of the sides of a matchbox made rough?	2m
11.	Why is sliding friction slightly smaller than static friction?	2m
12.	A pencil eraser loses tiny pieces of rubber each time you use it. Why does this happen?	2m
13.	Cartilage is present in the joints of our body, which helps in their smooth movement. With advancing age, this cartilage wears off. How would this affect the movement of joints? 	2m

14.	Why do car wheels often spin on icy roads?	3m
15.	Why will a pencil write on a paper, but not on a glass?	3m
16.	Why is it easy to drag a mat when nobody is sitting on it but difficult when somebody is sitting on it?	3m
17.	Write five consequences if friction never existed on this earth or in air.	5m
18.	(a) What's the advantage for sportsmen in using shoes with spikes? (2m)  (b) Why should objects moving in fluids have special shapes? (3m) 	5m
Case-based Questions Q. No 19 & 20 are case-based questions. A passage is followed by four questions. Answer the questions.		
19.	Static friction is a force that keeps an object at rest. Static friction definition can be written as: The friction experienced when individuals try to move a stationary object on a surface, without actually triggering any relative motion between the body and the surface on which it is on. (a) Two friends are trying to push a heavy load as shown in figure below.  Suggest a way which will make this task easier for them. (1m) (b) What enables a ladder to lean against the wall? (1m) (c) Why are treaded tyres used in cars, trucks and bulldozers? (2m)	4m
20.	Friction always works in the direction opposite to the direction in which the object is moving, or trying to move. Friction also produces heat. If you rub your hands together quickly, you will feel them get warmer. Friction can be a useful force because it prevents our shoes slipping on the pavement when we walk and stops car tyres skidding on the road. When you walk, friction is caused between the tread on shoes and the ground. This friction acts to grip the ground and prevent sliding. Sometimes we want to reduce friction. For example, we use oil to reduce the friction between the moving parts inside a car engine. In many	4m

	machines, friction is reduced by using ball bearings. The reduced friction means there is less wear on the moving parts and less heat produced. i) When does friction arise? (1m) ii) Why should we apply oil on the hinges of the door? (1m) iii) Gymnasts apply some coarse substance on their hands. Why? (1m) iv) Why can friction never be eliminated? (1m)	

ANSWER KEY (CHAPTER-9 FRICTION)

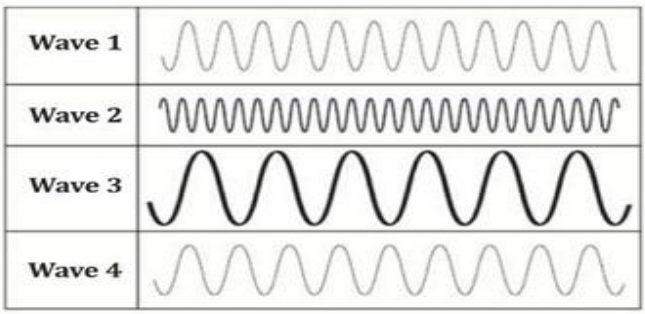
Question Number & Type	Question(s)	Marks
1.	(b) sliding friction	1m
2.	(d) Friction does not act on a ball moving through air	1m
3.	(d) 2, boat because of air and river and the person because of air	1m
4.	(d) gravel.	1m
5.	(b) from left to right (→)	1m
6.	(c) to reduce the air drag	1m
7.	(c)	1m
8.	(a)	1m
9.	Rough surfaces offer more resistance and provide more friction, smooth surfaces offer less resistance and provide less friction.	2m
10.	Rough surface on the sides of a matchbox provides more resistance. On rubbing the matchstick against this rough surface, heat is generated.	2m
11.	Sliding friction is smaller than static friction because two sliding objects find less time to get interlocked against each other's irregularities of surfaces; as a result, they experience less friction.	2m

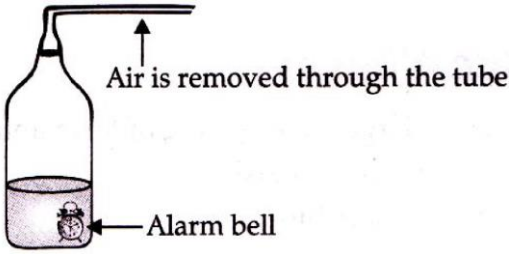
12.	When we use a pencil eraser, friction between the eraser and the paper rubs off some rubber particles from the eraser. Thus, the eraser loses tiny pieces of rubber due to friction.	2m
13.	The wearing off of cartilage will increase the friction. As a result the movement of joints will become difficult which may lead to joint pains. In medical language, such a condition is called arthritis.	2m
14.	A car spins on icy roads because the treads of the car can no longer maintain the proper friction to keep it moving. Due to the smooth surface of ice, the friction reduces and the car spins.	3m
15.	We are able to write on paper because there is friction between the tip of the pencil and paper. We are not able to write on a glass because the glass surface is very smooth due to which friction between the tip of the pencil and glass surface is less.	3m
16.	Friction is caused by the interlocking of the irregularities in the two surfaces. It is obvious that the force of friction will increase if the two surfaces are pressed harder. So, it is easy to drag a mat when nobody is sitting on it but difficult when someone is sitting on it.	3m
17.	If there is no Friction then: Friction prevents objects from sliding apart. Everything would slide to the lowest point if there was no friction. It would be impossible to scale anything. We will be unable to write without friction. We will not be able to fly a kite. No riding a bike, cycle, or even a car or bus without friction. There are no machines in businesses, so there are no mechanics without friction. We would not have been able to sit, walk, run, or dance without friction	5m
18.	(a) Spikes under the shoes give a good grip on the running track for the athletes. The athletes need a good grip on the track to run at the fastest speed. (b) The fluids, like various liquids or air, i.e. gaseous medium, also exert frictional force known as drag. To minimise the effect of this drag, streamlining the movement of the object in the fluid is necessary, which can be achieved by changing the shape of the body. Objects moving in fluids must have a specific shape called streamlined shapes or aerodynamic shapes. A streamlined Shape or Aerodynamic Shape is a shape that overcomes fluid friction.	5m
19.	(a) Keeping rollers (like pieces of cylindrical logs) under the heavy box will make their task of pushing the box easier. (b) Friction of the ladder against the floor enables it to lean against the wall. (c) Treads in tyres of trucks, buses and bulldozers are deep cuts, ridges and grooves that provide better grip with the ground thereby increasing friction for better handling.	4m
20.	Friction always works in the direction opposite to the direction in which the object is moving, or trying to move. Friction also produces heat. If you rub your hands together quickly, you will feel them get warmer. Friction can be a useful force because it prevents our shoes slipping on the pavement when we walk and stops car tyres skidding on the road.	4m

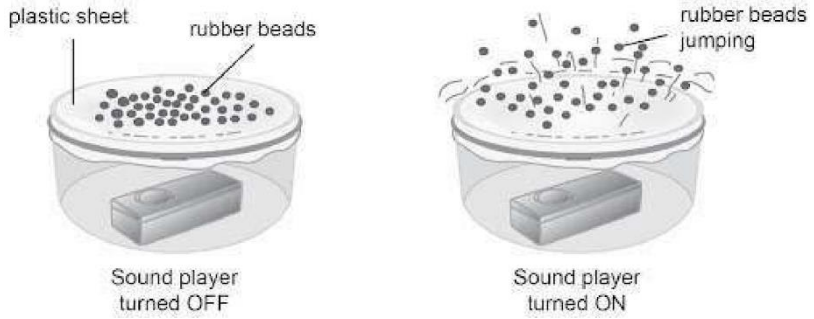
	When you walk, friction is caused between the tread on shoes and the ground. This friction acts to grip the ground and prevent sliding. Sometimes we want to reduce friction. For example, we use oil to reduce the friction between the moving parts inside a car engine. In many machines, friction is reduced by using ball bearings. The reduced friction means there is less wear on the moving parts and less heat produced. i) Friction arises when the irregularities between the surfaces of two objects in contact interlock against each other. ii) We apply oil on the hinges of the door that gets jammed because oil acts as a lubricant to reduce friction at hinges. iii) Gymnasts apply some coarse substance on their palms to get a good grip and increase the friction while lifting weights. iv) Friction can never be eliminated because no surface is perfectly smooth. There are always some irregularities.	

CHAPTER 10- SOUND

Question	Question(s)	Marks
1.	The voice box is also called as - a) stomach b) heart c) larynx d) mouth	1m
2.	In dholak, sound is produced due to a) stretched membrane b) stretched strings c) air column d) none of these	1m
3.	If we tighten the strings of an instrument, pitch will be a) higher b) lower c) constant d) no pitch	1m
4.	A vibrating body should oscillate minimum how many times per second to make a sound audible for humans? a) 10 times b) 20 times c) 30 times d) 40 times	1m
5.	Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen. Why? a) The speed of sound is greater than the speed of light. b) The speed of sound is equal to the speed of light. c) The speed of light is greater than the speed of sound. d) All of the above	1m
6.	A student does an activity where he puts a ringing phone in the glass tumbler. The student covers the glass tumbler with his hand. The student removes air from the glass tumbler by using a vacuum and observes the sound of the phone fainting gradually. What can be concluded from the observation? a) sound eventually fades away b) sound gets absorbed by the surrounding c) sound requires a medium to travel d) sound get reflected in all directions	1m
	S.No. 7 & 8 are Assertion and Reason Type Questions – In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: a) If both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). b) If both Assertion (A) & Reason (R) are true and Reason (R) is not correct explanation of Assertion(A) c) If Assertion (A) is true but Reason (R) is false. d) If Assertion (A) is false but Reason (R) is true	

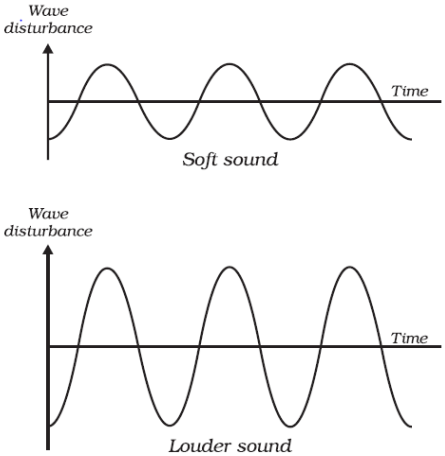
7.	**Assertion**: Two persons on the surface of the moon cannot talk to each other. **Reason**: There is no atmosphere on the moon.	1m
8.	**Assertion**: The sound of the human voice is produced due to vibrations in the vocal cords. **Reason**: Vibration means a kind of rapid to and fro motion of an object.	
9.	Why are some sounds louder than others? Which factor decides the shrillness in a sound?	2m
10.	It is known that vibration is necessary for producing sound. But why is the sound produced by every vibrating body not heard by us? (Such as tremors during an earthquake) What is the name of those sounds which have a frequency more than 20000 Hz?	2m
11.	What does the working of a toy telephone tell us about sound? The picture shows four sound waves.  Which sound wave appears to have the highest frequency? Give a reason.	2m
12.	  It is a common sight to see working people at airports and factories wearing ear-protectors. Give reason for wearing such devices. To what extent can a human ear bear the noise?	2m
13.	Suresh was enjoying the rainy season. Suddenly he is scared by a thunderbolt 4 seconds after he saw lightning in the east direction. Which formula we can use to find out the distance of lightning from Suresh? (Speed of light = 3×10^8 m/s) Find the distance of lightning from Suresh.	2m
14.	On a hot summer day, a pesky little mosquito produced its warning sound near your ear. The sound is produced by the beating of its wings at a rate of about 600 wing beats per second. (i) What is the frequency in Hertz of the sound wave? (ii) What would be the time period of the sound wave?	3m
15.	(i) How does a bow produce sound on violin strings?	3m

	 (ii)How does a Jal tarang produce sound?	
16.	(i) What do we mean when we say metals are sonorous? (1m) (ii) What determines the shrillness of the sound produced by the the voice of a baby? (1m) (iii) What are the three main causes of oceanic sound pollution?(3m)	3m
17.	(i) In the olden days, when people used to communicate using drums (talking drums), they used to beat the drums near a flowing water body. Analyze the reason why they chose to beat the drums near a flowing water body. (3m) (ii) Why don't we hear the sound of an explosion on the surface of the moon? (2m)	5m
18.	(i) An alarm bell is kept inside a vessel as shown in Figure below. A person standing close to it can distinctly hear the sound of alarm. Now if the air inside the vessel is removed completely how will the loudness of the alarm get affected for the same person? (3m)  (ii) Draw a diagram showing a soft sound and a louder sound.(2m)	5m
Case-based Questions Q. No 19 & 20 are case-based questions. A passage is followed by four questions. Answer the questions.		
19.	Sound plays an important role in our life. It is a form of energy which makes us hear . Vibrating objects produce sound. Vibration is the to and fro or back and forth movement of an object. Sound needs a medium to travel. Hence, it cannot travel in a vacuum. Human beings have a voice box or larynx which is present in their throat on the upper side of the windpipe. The larynx has two vocal cords which have a narrow slit between them so that air can pass through it. As the lungs throw the air out of the windpipe, it passes through the slit and hence allows the production of sound as the vocal cords start vibrating. Since sound travels in the form of waves, it is important to study the characteristics of waves. The three main properties of waves are amplitude, frequency, and time period. The magnitude of disturbance in the medium on either side of the mean value is called amplitude . Larger the amplitude, louder the sound. The number of oscillations/vibrations per second is called frequency. which is expressed in Hertz (Hz). Time taken for one complete oscillation/vibration is the time period. i) Which part of the human throat is responsible for the voice produced by a human?	4m

	ii) Why do astronauts need special talking devices on the moon? iii) We can hear heartbeats by using a stethoscope. What does it prove about sound? iv) What do you call the maximum displacement of a vibrating object from its mean position?	
20.	Sound is a form of energy that is produced when air molecules vibrate in a particular pattern called waves. Hence, sound is a wave. Sound is produced by vibrating objects. Vibration can be described as to and fro motion of objects. Sound always requires a medium to travel from the source of its production to the receiver end. Speed of sound is maximum in solids and minimum in gases. Raghav kept a mini sound player in each of two similar containers. He then tightly covered both the containers with stretched plastic sheets. He placed some tiny rubber beads on the surface of the sheets. The picture shows what Raghav noticed when he turned on the sound player. Sound is a wave and waves have amplitude. Amplitude that decides loudness of sound is measured in decibels (dB). Decibels and intensity, however, do not depend on the ear. They can be measured with instruments. A whisper is about 10 decibels while thunder is 100 decibels. Listening to loud sounds, sounds with intensities above 85 decibels, may damage your ears. If a noise is loud enough, over 120 decibels, it can be painful to listen to. One hundred and twenty decibels is the threshold of pain.  (i) Why do the rubber beads jump on plastic sheet when sound player is turned on? (ii) Would the result of Raghav's activity change if fewer beads had been used? Explain your answer. (iii) Ria used a device to measure the loudness of a machine. She recorded her observations. Which of the following represents the correct measurement of loudness? (a) 80 Hz (b) 80 seconds (c) 80 dB (d) 80 K (iv) Arrange the speed of sound in solids, liquids and gases in ascending order: (a) Gas < Liquid < Solid (b) Liquid < Gas < Solid (c) Liquid < Solid < Gas (d) Solid < Liquid < Gas	4m

ANSWER KEY (CHAPTER 10- SOUND)

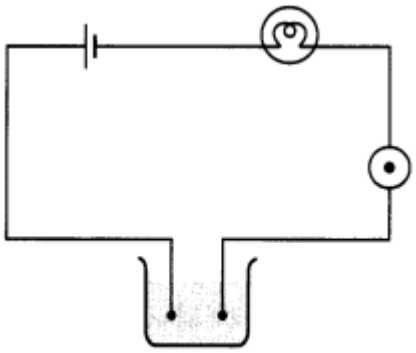
Question	Question(s)	Marks
1.	c) larynx	1m
2.	a) stretched membrane	1m
3.	a) higher	1m
4.	b) 20 times	1m
5.	c) The speed of light is greater than the speed of sound.	1m
6.	c) sound requires a medium to travel	1m
7.	(a)	1m
8.	(b)	
9.	Some sounds are louder than others due to their high amplitude. Shrillness in a sound is decided by its frequency.	2m
10.	Sound of every vibrating object may not be audible to us. This is because either that sound is below the audible range or above the audible range. Sounds which have a frequency more than 20000 Hz are called ultrasound.	2m
11.	When we hear sound through a toy telephone, we come to know that sound can travel through solids. Wave 2 appears to have the highest frequency because it shows a large number of oscillations in one second.	2m
12.	People working at airports and factories are often prone to very loud noises which may be harmful to their ears. So, to protect their eardrums, they wear special ear-protectors. A human ear can bear noise only upto 80 decibels.	2m
13.	We use the formula DISTANCE = SPEED X TIME to find the distance of lightning from Suresh. Distance = $(3 \times 10^8) \times 4 = 12 \times 10^8$ m	2m
14.	(i) The frequency of the sound wave of wings of mosquito is 600 Hertz (ii) Time period is the inverse (reciprocal) of frequency. Hence time period of sound of wings of mosquito = 1 / 600 i.e. 0.0016 seconds	3m
15.	(i) A violinist rubs his bow to create friction between the bow and the violin strings, thereby producing sound. (ii) A Jal tarang involves the vibrations of the air column right above the level of water in cups. As the vibrations of the air column vary, it produces music accordingly.	3m
16.	(i) Metals vibrate when they are struck. So, they produce sound and are called sonorous. (ii) Very small sized vocal cords (small length) are responsible for producing shrillness in the sound produced by the voice of the baby. (iii) Oceanic sound pollution is caused by – (i) Underwater blasting (ii) Dredging (iii) Underwater earthquakes	3m

17.	(i) Water is a denser medium, and hence, sound travels faster in it. Hence, beating drums near the flowing water body ensured that the sound travelled faster and farther to be heard at far off places. (ii) No matter how loud a sound may occur on earth, we will not be able to hear that sound on the surface of the moon because there is no atmosphere on the moon's surface. There is only vacuum and sound does not travel in vacuum.	5m
18.	(i) Initially, the person is able to hear the sound coming from air and water distinctly. But after some time, when the air is completely removed from the bottle, the sound will pass through the water and then the glass and finally reach the man. So, the man will not hear the sound which was coming through the air initially. (ii) Diagram showing a soft sound and a louder sound 	5m
19.	i) Larynx in the human throat is responsible for the voice produced by a human. ii) Astronauts need special talking devices on the moon because there is no atmosphere on the moon. There is a vacuum on the moon. iii) We can hear heartbeats by using a stethoscope. It proves that sound can travel through solids. iv) The maximum displacement of a vibrating object from its mean position is called amplitude.	4m
20.	(i) When a sound player is turned on, it creates sound waves due to its vibrations. This makes the rubber beads jump on the plastic sheet. (ii) Even if fewer beads had been used the result of Raghav's activity would not change. This is because the intensity of sound vibrations is not dependent upon the number of beads on the rubber sheet. (iii) The correct measurement of loudness is represented by - (c) 80 dB (iv) speed of sound in solids, liquids and gases in ascending order: (a) Gas < Liquid < Solid	4m

CHAPTER 11 -CHEMICAL EFFECTS OF ELECTRIC CURRENT

Q NO	SECTION A	MARKS
1	While performing an experiment a student observed that when electrodes are immersed in water and electricity passed, the bubbles are formed on the negative terminal. He was bit confused; can you help in identifying the gas: (a) Hydrogen (b) Carbon dioxide (c) Oxygen (d) Nitrogen	1
2	Tin cans, used for storing food, are made by electroplating tin onto iron. Why? (a) Tin gives a shiny appearance (b) To make the vessel cheap (c) Tin is less reactive than iron (d) To make the vessel lighter	1
3	When electric current is passed through the copper sulphate solution, copper sulphate dissociates into: (a) copper and sulphur (b) copper and oxygen (c) copper and sulphate (d) none of these	1
4	Shyam decided to test whether some fruits and vegetables conduct electricity or not. A magnetic compass was connected in a circuit is used to check: (a) magnetism in electric current (b) slow current (c) small current (d) none of these	1
5	When Ram purchased new articles like car parts, bath taps, kitchen gas burners, bicycle handlebars were shining for few months later they lost the shine as they were electroplated with: (a) chromium (b) zinc (c) tin (d) none of these	1
6	Ramprasad has an electroplating factory in Kanpur. Disposal of used conducting solutions is a major concern. Suggest him the best possible option in disposing waste (a) in the nearby river (b) in the nearby pond (c) in the nearby cornfield (d) according to the disposal guidelines of waste management bodies	1
7	**Q. no 7-8 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:** **(a) Both A and R are true and R is the correct explanation of A** **(b) Both A and R are true and R is not the correct explanation of A**	1

	(c) A is true but R is false **(d) A is False but R is true** Assertion: Electroplating is a method of coating a metal on another metal using electric current Reason: Cobalt is used to give a shiny appearance in the electroplating process.	
8	Assertion: Distilled water is good conductor of electricity Reason: Small amounts of mineral salts present in water makes it a good conductor of water.	1
	SECTION B	
9	Suhaas out of curiosity added a small amount of sugar in distilled water. Can you predict whether the resulting solution will be a good or bad conductor of electricity? On what basis you have come to conclusion.	2
10	Show with the help of a diagram that lemon juice and vinegar are good conductors of electricity.	2
11	Ram in one of the demonstrations has seen electric fires being extinguished with either using CO_2 extinguisher or mud but not water? Can you formulate a reason for it.	2
12	Current does not flow in a circuit if there is a gap between the two wires. Does it indicate that air is a poor conductor of electricity? Does air never conduct electricity? Assess your answer.	2
13	Give an example of the chemical effect of the electric current.	2
	SECTION C	
14	(a)What is an LED? Justify its preferred use to other types of bulbs? (b) It is preferred to classify materials as good conductors and poor conductors instead of classifying them as conductors and insulators. (1.5m+1.5m)	3
15	Akshara is a very keen observer and seen her mother using some special jewellery during family functions that are very shiny but not precious. Analyse the reason as to why electroplated jewelleries are in demand?	3
16	Suhaas is an 'entrepreneur' and has been provided a loan by a bank to set up a small electroplating unit. What object would you like to electroplate and for what purpose?	3
	SECTION D	
17	(a). In a circuit, Ram observed that copper is deposited on the electrode connected to the battery's negative terminal. Seema also repeats the same experiment. But she finds only one copper plate. Therefore, she takes a carbon rod as the negative electrode. Will copper still be deposited on the carbon rod? Explain your answer**.** (3m) (b).Ram who was living in the coastal region of Kerala tests the drinking water and seawater with his tester. He finds that the compass needle deflects more in the case of seawater. Can you analyse the reason behind it?. (2m)	5
18	(a). During the peak of monsoon my office needed to carry electrical repairs outdoors, so I called an electrician.? Is my action justifiable? Please justify your answer. (2m) (b). An electric current is passed into a conducting solution. What can be the three possible observations? (3m) **OR** Compare the advantages and disadvantages of electroplating?	5

	SECTION E	
19	Gayathri made a circuit as shown in the figure. She observed that the bulb did not glow but on bringing a compass needle near it shows deflection. She was quite confused that if current is flowing through the circuit then why the bulb is not glowing. Meanwhile her friend Ram arrived and suggested her to add one more cell in the circuit. The bulb then started glowing. (courtesy NCERT Figure)  Fig. 14.10 (a) Define a circuit. (b) What does the deflection of a compass needle show? (c) Why did the bulb not glow in the first case but glow in the second case? (d) What value of Ram is shown here?	4
20	Madhu and her mother reached a jewellery shop to purchase some ornaments. She liked the necklace very much but her mother told her not to purchase it because it is not real gold. When she checked the information tag, it said 1gm gold. The necklace was quite big and heavy. She was surprised to see it and asked about it. The salesman explained that it is a gold-plated necklace. Then Sita checked that the process of depositing a layer of any desired metal on another material by means of electricity is called electroplating. It is one of the most common applications of the chemical effects of electric current. Nowadays, people prefer to buy gold-plated jewellery, similarly, iron articles are often coated with zinc or chromium to protect them from rusting and corrosion. In electroplating factories, the disposal of the used conducting solution is a major concern. It is a polluting waste and specific disposal guidelines should be followed to protect the environment. (a) What is electroplating (2m) (b)Write two applications of electroplating (2m)	4

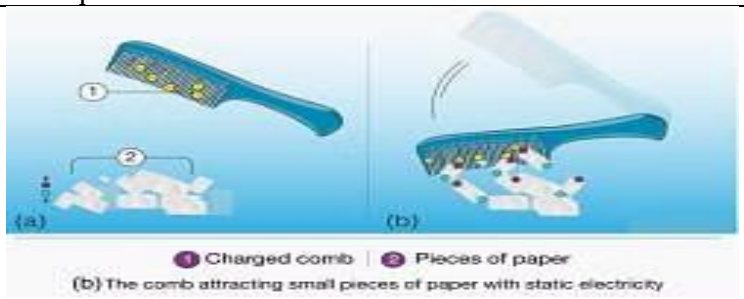
ANSWER KEY (CHAPTER 11- CHEMICAL EFFECTS OF ELECTRIC CURRENT)

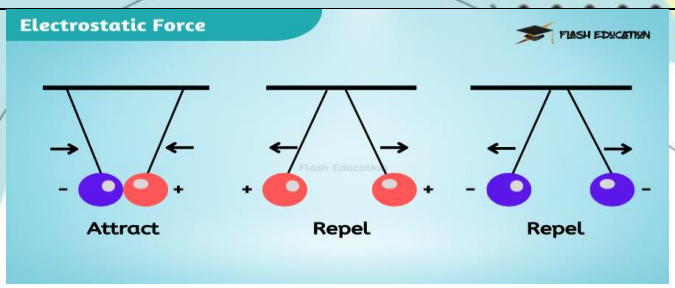
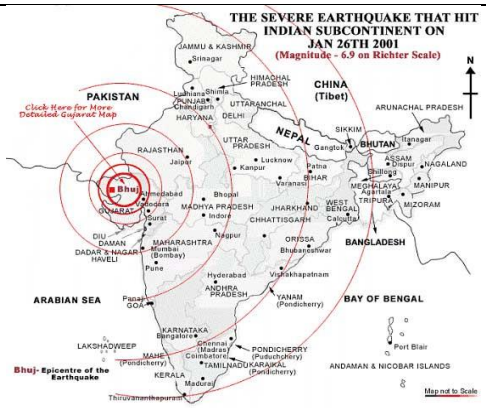
Q NO	SECTION A	MARKS
1	a	1
2	c	1
3	c	1
4	c	1
5	a	1
6	d	1
7	c	1
8	d	1
	SECTION B	
9	When we add a small amount of sugar to distilled water, the resulting solution will be a poor conductor of electricity. Sugar will not produce ions when it is dissolved in water as it is a non- electrolyte substance. As for the conduction of electricity, free ions are required	2
10	Relevant diagram should be given marks FIG 14.2 NCERT TEXT BOOK	2
11	As water is a good conductor of electricity it can cause electrocution. Hence, water is avoided in extinguishing electric fires.	2
12	Air is a poor conductor of electricity if it is dry but in certain cases like during lightning and when air is moist, air may conduct electricity.	2
13	When an electric current is passed through water, then water dissociates into hydrogen and oxygen. This is an example of the chemical effect of electric current.	2
	SECTION C	
14	(a). The electric device which is used in the tester instead of the bulb is an LED. Its full form is Light Emitting Diode. It is preferred to other bulbs as it can glow even when weak or less current flows through it. (b) any relevant point can be given marks	3
15	Electroplated jewelleries are in demand because firstly, they are as shiny and attractive as real jewelleries. They are light-weighted and cost effective. Secondly, one feels free to wear it because of the growing problem of snatching and theft.	3
16	He can select the objects of his own choice and interest like electroplating jewellery items with gold and silver, wheel rims of vehicles with nickel, etc. It will make the objects shiny, attractive and durable. Any other relevant answer.	3
	SECTION D	
17	(a) Copper from the copper sulphate ($CuSO_4$) solution will be deposited on the carbon rod. Copper sulphate splits into copper and sulphate when an electric current is passed through the copper sulphate solution. The free copper gets drawn to the electrode connected to the battery's negative terminal, i.e. carbon rod, and gets deposited on it. Thus, Seema will obtain a layer of copper on a carbon rod.	5

	(b) The amount of salts dissolved in the seawater is more than that of the drinking water. So, seawater will be a better conductor than drinking water. This is the reason behind the increased deflection of the needle in the seawater compared to the drinking water.	
18	(a). No, It is not safe for one to repair electrical appliances outdoors during heavy downpours. Rainwater is composed of some amount of dissolved salts that make it conductive. This can cause electric shocks and harm the electrician while working outdoors during heavy downpours. (3m) (b). Few possible observations when electric current is passed through any conducting solution are. i) Bubbles of gas can be formed on the electrodes and deposits of metal may also be seen on electrodes. ii) The solution may get heated. iii) There can be a change in the colour of the solution. (2m) **OR** Advantages: • It protects the metals from being corroded. • It prevents the rusting of metals. • It makes cheap and dull metals shiny and attractive. • It can make more reactive metals like iron less reactive. • Chromium coating on metals give lustre to objects. Disadvantages • Pollutants from electroplating industries are very harmful. Some chemicals are very lethal for both humans and animals. • It is an expensive process.	5
	SECTION E	
19	(a) Circuit is a closed path through which an electric current flow. (b) Deflection of compass needle shows that the current is flowing in the circuit. It is the magnetic effect of current. (c) The current flowing through the circuit in the first case was too low to make the bulb glow but adding a cell in the second case makes the bulb glow. (d) Ram is intelligent, helpful, analytical and with scientific aptitude.	4
20	(a) Definition of electroplating (2m) (b) Any two applications of electroplating	4

CHAPTER 12- SOME NATURAL PHENOMENA

Q NO	SECTION A	MARKS
1	Which of the following can not be charged easily by friction? a) a copper rod b) a plastic scale c) a woolen cloth d) an inflated balloon	1
2	Earthquakes of which magnitude of the following cause the maximum damage? (a) 3.0 (b) 8.0 (c) 5.0 (d) 4.0	1
3	Electric current has to be passed from one body to another. For this purpose, the bodies must be joined- (a) cotton thread. (b) plastic string. (c) copper wire (d) rubber band	1
4	Where should the lightning conductor be located? (a) In the bottom of the building (b) In the middle of the building (c) On the top of the building (d) Anywhere can be installed	1
5	Which of the statements is INCORRECT? (a) Earthquakes can occur any time anywhere over the world. (b) The earth's outer layer plates are always in continuous motion. (c) Earthquakes on the earth can not be caused by the eruption of a volcano. (d) The electric discharge process cannot occur between the cloud and the earth.	1
6	Which of the following is not likely to cause a tsunami? (a) Nuclear explosion under sea (b) Earthquake (c) Volcanic eruption (d) Lightning	
7	Which of the following is not likely to cause a tsunami? (a) Nuclear explosion under sea (b) Earthquake (c) Volcanic eruption (d) Lightning	1
8	**Assertion-** A person should not lie on the ground during lightning. **Reason-** Our body is a good conductor. . Both assertion and reason are true and reason is the correct explanation of assertion.	1

	a. Both assertion and reason are true and reason is not the correct explanation of assertion b. Assertion is true and the reason is false. c. Assertion and reason are false	
	SECTION B	
9	During winter when we touch our friend after coming from sunlight we suddenly get current shock. Is it because we got electric current in our body or  there is another reason?	2
10	Why does aluminum foil in an electroscope come into its original position when touched by a person?	2
11	 https://images.app.goo.gl/CXk48Vyewc4WqEYX9 Why should we take such positions or take shelter under tables during earthquakes?	2
12	 (b) The comb attracting small pieces of paper with static electricity Why are pieces of paper getting attracted towards comb?	2
13	Write the nature of the charges on a glass rod and silk cloth when they are rubbed with each other.	2
	SECTION C	
14	How is lightning different from the short circuit we see at our home?	3
15	You are provided with two metal clips, cardboard pieces, a glass container and a charged metal rod. Design an activity using the above items to make an electroscope.	3

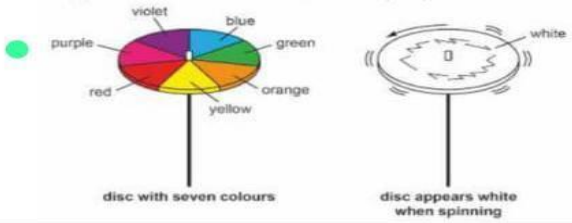
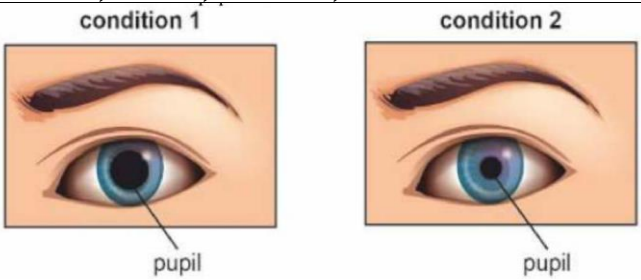
16	 https://images.app.goo.gl/GVfGwe7BwdAwMQkj9 Observe the figure and write what you have understood from these three cases.	3
	SECTION D	
17	I. Why should a building be protected with lightning conductors? II. What is the main principle of lightning conductor? III. If your building is not protected with the lightning conductor, what will you do when lightning strikes?	5
18	I. What causes an earthquake? II. Why is central Himalaya considered a seismic zone of India? III. Which type of home should be made in seismic zones?	5
	SECTION E	
19	Aman rubbed two balloons with a silk cloth, then he observed the following things- a. Two balloons repel each other when brought closer. b. One balloon stacked to the wall for some time. Now answer these questions- I. What process happened during rubbing balloons with cloth? II. Why do two balloons repel? III. Why is one balloon attracted towards the wall? IV. Name one device based on this concept?	4
20	 Observe the figure and answer the following questions- I. When was the severe earthquake hit Bhuj (Gujrat)? II. Was its minor earthquake or a destructive one? III. Which type of place is mostly affected with earthquakes? IV. What do you understand about epicenter?	4

ANSWER KEY (CHAPTER 12: SOME NATURAL PHENOMENA)

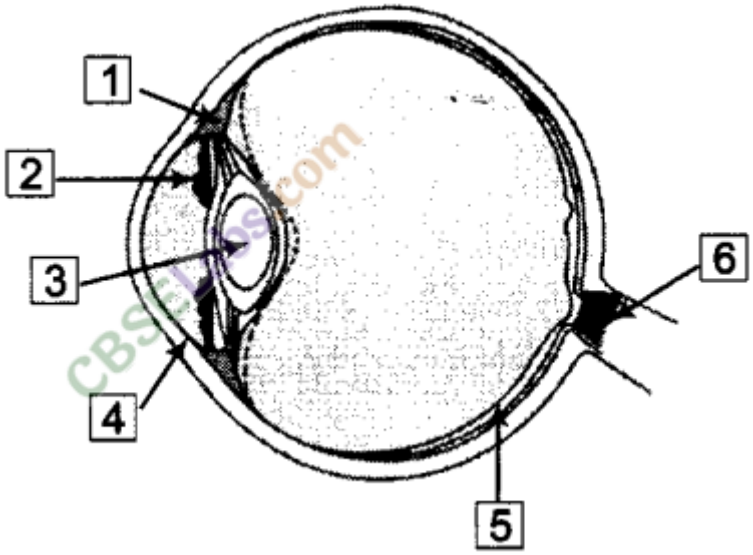
Q NO	SECTION A	MARKS
1	a)	1
2	b)	1
3	c)	1
4	c)	1
5	c)	1
6	d)	1
7	b)	1
8	a)	1
	SECTION B	
9	Yes, electric charge is formed most commonly in winters or when the climate around us is dry. The air becomes dry and electrons easily develop on the surface of our skin. During summer, the air moisture eradicates the negatively charged electrons and we rarely feel electric charge.	2
10	The strips carrying similar charges repel each other when given charge by an external body. Hence, they move apart in the electroscope. After some time, due to the electric discharge of the foil strips, they stop repelling each other. Hence, the strips come back to their initial position.	2
11	At the time of an earthquake, if people are trapped inside a house, the maximum possibility is that the roof of the building may fall. To handle this, people should take shelter under the bed or table, which would take the impact of roof fall and the chances of survival may increase.	2
12	The paper is attracted to the comb. This happens because the charged comb induces an opposite charge in the paper and as opposite charges attract, the paper sticks to the comb.	2
13	The fabric is negatively charged and the rod is positively charged.	2
	SECTION C	
14	Lightning is a temporary flow of current, an electrical discharge. Electrons rush from where there are too many toward where there are too few. It is a bit like a short circuit between two differently charged bodies. A circuit is simply a path for electrons to flow.	3
15	Cover the glass jar with cardboard and make a small hole in it to insert a metal wire or a metallic paper clip. Attach two metal plates (like - aluminum foil leaves) on the end of the wire/paper clip which is inside the glass jar.	3
16	In the first figure bobs are getting attracted because they are having different charges. In the second and third figure bobs are repelling because they are having different charges.	3
	SECTION D	
17	I. Lightning conductors do not allow the charge to accumulate on a building. It transfers all the charges to the earth, protecting the building from being struck by lightning II. The conductor works on the principle of induction. Whenever a charged cloud passes by the building, the conductor gets charge x opposite	1+2+2

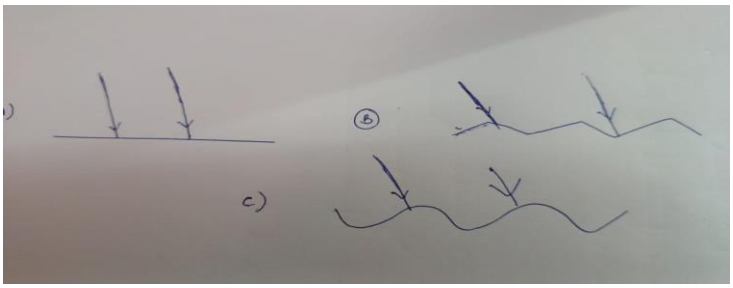
	to that of the cloud through the process of induction. Now, this acquired charge moves to the earth through the earthing system. III. *stay off corded phones, computers and other electrical equipment that put *you are in direct contact with electricity. Stay away from windows and doors, and stay off porches.	
18	I. Earthquakes occur due to sudden tectonic movements within the Earth's crust. The Earth's crust is divided into large sections called tectonic plates, which float on the semi-fluid layer known as the asthenosphere. These plates are constantly in motion II. The central Himalaya, considered as a prominent 'seismic gap', is generally believed to be the most vulnerable segment, due for a great plate boundary earthquake II. If possible, in earthquake prone areas, the houses should be made of wood. It would be better if the walls of such buildings do not touch the ground as was done by the ancient Japanese in building their temples.	2+1+2
19	I. Rubbing the balloons against cloth causes the balloons to become electrically charged. II. Because they have the same charge. III. Because the balloon is charged and the wall is uncharged. IV. Electroscope	1+1+1+1
20	I. 26 Jan 2001 II. Destructive one III. Most earthquakes occur along the edge of the oceanic and continental plates. IV. Epicenter is the location on the surface of the Earth directly above where the earthquake starts.	1+1+1+1

CHAPTER 13- LIGHT

Q NO	SECTION A	MARKS
1	Radha has a multi- coloured disc. She finds that the disc appears white when she spins it rapidly  What can be concluded from the picture? a) All spinning objects appear white b)All discs are multilayered c) Objects lose their colour on spinning . d) White is a mixture of seven different colours	1
2	Which of these objects is non luminous in nature? a) Sun b) Firefly c) Wood d) all the above	1
3	All object can only be seen when a) light emitted by object b) light pass from the object c) light completely absorb by the object d) Reflected light from the object reaches to us	1
4	Distance between the object and the image is 10 cm .What will be the distance between mirror and object ? a) 5 cm b) 2cm c) 10 cm d) 15 cm	1
5	 The picture above shows the size of the pupil under two different conditions a) condition 1 and 2 both shows dilation b) condition 1 shows dilation and condition 2 show contraction c) condition 1 shows contraction and Condition 2 shows dilation d) None of the above	1
6	Rama is focusing torch light perpendicularly on a plane mirror, what will be the angle in which it will be reflected? (a) 45 degrees (b) 90 degrees (c) 180 degrees (d) 360 degrees	1

7	In the following questions , the Assertion and Reason have been put forward .Read the statements carefully and choose alternative from the following : (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion . (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion . (c) Assertion is true but the Reason is false (d) The statement of the Assertion is false but the Reason is true. Assertion : In the image formed by the plane mirror the right side of the object appears on the left side and vice versa. Reason : This is caused by the phenomenon called lateral Inversion.	1
8	Assertion :Formation of rainbow shows seven colour in the sky Reason : Reflection is the phenomenon in which light scattered into different colours	1
	SECTION B	
9	Ram while playing with his friends entered a dark room. Can they see objects in the room? Can they see objects outside the room? Analyse your answer based on light property	2
10	Shyam wanted to perform Activity using a laser torch on his eyes. His teacher advised him not to do so. Give justification for his teacher's advice?	2
11	Recommend 2 precautions to take care of your eyes	2
12	a)What will happen to the size of the pupil when we enter the dark room? b) How many cones than rods do nocturnal birds have?	2
13	State the laws of reflection	2
	SECTION C	
14	Compare regular and diffused reflection. Does diffused reflection defy the laws of reflection.	3
15	Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case. 1. Polished wooden table 2. Chalk powder 3. Cardboard surface 4. Marble floor with water spread over it 5. Mirror 6. Piece of paper	3

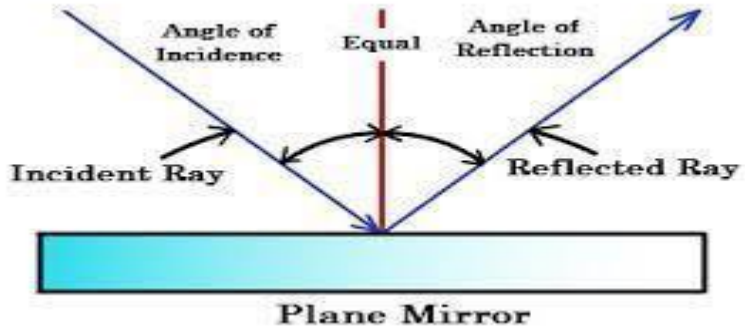
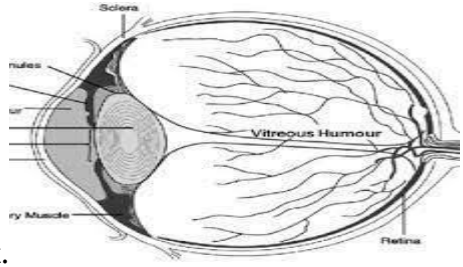
16	What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray	3
	SECTION D	
17	a)Ram went to the saloon to have his hair cut. Look at the figure. Can his image be obtained on a screen?  b) Write down the names of parts of the eye in the blank spaces shown in the figure. 	2 3
18	a). Formulate the phenomenon of dispersion through rainbows. b) Can the reflected rays be further reflected if incident on another mirror? c) Name the instrument which shows multiple reflections used by designers and Why?	2 1 2
	SECTION E	

19	Observe the following diagram fig A,B and C represent three situations, answer the following questions.  a) In which condition angle of incidence will be equal to angle of reflection . Justify your answer . b) Complete the fig A by drawing i) Position of plane mirror ii) Normal iii) angle of reflection. c) Differentiate between regular and irregular reflection.	2 1 2
20	Paheli conducts a survey in her society and finds out that nowadays many children wear spectacles as compared to 10 years back. a) What could be the possible reasons for weak eyesight in children? b) Discuss what measure to follow to take care of eyes (at least 2) c) Draw a well labelled diagram of the human eye.	2 1 2

ANSWER KEY (CHAPTER 13- LIGHT)

<table>
<tr><th>Q NO</th><th>SECTION A</th><th>MARKS</th></tr>
<tr><td>1</td><td>d) White is a mixture of seven different colours</td><td>1</td></tr>
<tr><td>2</td><td>c) Wood</td><td>1</td></tr>
<tr><td>3</td><td>d) Reflected light from the object reaches to us</td><td>1</td></tr>
<tr><td>4</td><td>a) 5 cm</td><td>1</td></tr>
<tr><td>5</td><td>b) condition 1 shows dilation and condition 2 show contraction</td><td>1</td></tr>
<tr><td>6</td><td>b) 90 degrees</td><td>1</td></tr>
<tr><td>7</td><td>a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion .</td><td>1</td></tr>
<tr><td>8</td><td>c) Assertion is true but the Reason is false</td><td>1</td></tr>
<tr><td></td><td>SECTION B</td><td></td></tr>
<tr><td>9</td><td>When we are in a dark room then we cannot see objects in the room. We can see the objects outside the room, because out of the room the light is available and the rays of light can enter our eyes after reflection from the objects.</td><td>2</td></tr>
<tr><td>10</td><td>The intensity of the laser light is very high which is harmful to the eye and can cause permanent damage to the eye. She can lose her eyesight also due to severe damage to the retina. Therefore, it is advisable not to look at a laser beam directly.</td><td>2</td></tr>
<tr><td>11</td><td>I. Do not read in too little or too much light.
ii. Wash your eyes frequently with cold water.
iii. Do not read by bringing your book too close to your eyes or keeping it too far.
iv. Never rub your eyes.
Any 2 precautions can be given marks</td><td>2</td></tr>
<tr><td>12</td><td>(a) enlarge (b) fewer</td><td>2</td></tr>
<tr><td>13</td><td>2 laws of reflection</td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td></tr>
<tr><td>14</td><td>No, diffuse reflection doesn’t mean the failure of laws of reflection.
<table>
<tr><th>Regular Reflection</th><th>Diffused Reflection</th></tr>
<tr><td>(i) All the reflected rays are parallel.</td><td>(i) The reflected rays are not parallel.</td></tr>
<tr><td>(ii) It occurs on a smooth and polished surface.</td><td>(ii) It occurs on the rough surface.</td></tr>
<tr><td>(iii) Reflected rays are in one direction.</td><td>(iii) Reflected rays are scattered in different directions.</td></tr>
</table></td><td>3</td></tr>
<tr><td>15</td><td>1. Regular reflection will take place because the surface is plane and polished.
2. Diffused reflection will take place because the surface is rough.</td><td>3</td></tr>
</table>

	3. Diffused reflection will take place because the surface is rough. 4. Regular reflection will take place because the surface is smooth and plane. 5. Regular reflection will take place because the surface is plane and polished. 6. Diffused reflection will take place because the surface is rough.	
16	Here, the angle of reflection is 90°. As we know, according to the laws of reflection that angle of incidence is equal to angle of reflection. Here, the angle between the incident ray and reflected ray is 90°. i.e., $\angle i + \angle r = 90°$ Since, $\angle i = \angle r$ We can write, $\angle i + \angle i = 90°$ $\Rightarrow 2\angle i = 90°$ $\Rightarrow \angle i = 45°$ Angle of incidence = 45°.	3
	SECTION D	
17	(a). The image of the child cannot be obtained on the screen because the image is not real. The images formed by plane mirrors are virtual, so these virtual images cannot be seen (or obtained) on the screen. (b) The names of the parts of the eye as shown in the figure are: 1.Ciliary muscle 2.Iris 3.Lens 4.Cornea 5.Retina 6.Optic nerve	2 3
18	(a) phenomenon of dispersion of light and formation of rainbow. (b) Yes, because of multiple reflections. (c)Kaleidoscope, because of multiple reflections it gives different patterns.	2 1 1+1
	SECTION E	
19	a) In all the cases angle of incidence will be equal to angle of reflection because as per laws of reflection angle of incidence is equal to angle of reflection. b)	2

	 c) In regular reflection, light reflected from a smooth surface in a definite direction. In irregular reflection, light is reflected from a rough surface in all directions and not in a definite direction.	1 2
20	a) Myopia or hypermetropia b) Eat a healthy, balanced diet. ...  Maintain a healthy weight. Any 2 c) Diagram + Labelling	2 1 1+1