NEW ERA PUBLIC SCHOOL (2021) ①

Subject :- Science Topic :- Winds, Storms and Cyclones

Class :- 7th Lesson no :- 15

Solved Assignment of Term-II

→ Short Answer Questions :-

D. Answer in brief.

Q1 :- What is air pressure?

Ans :- The weight of the air pushing down on any surface is called atmospheric pressure or air pressure.

Q2 :- Why do we observe winds blowing towards the equator?

Ans :- The regions near the equator get direct sunlight and become warm. The land in turn heats the air above it. The warm air is less dense and so rises up, leaving an area of low pressure underneath. Cooler air from the regions north and south of the equator rushes to this area to equalise the pressure. Similarly, the cold air above the polar regions moves towards the equator and is replaced by warmer air from the temperate regions. These movements of air on a global scale give rise to permanent wind currents.

Q3 :- Where is the air pressure high — at the equator or at the Poles?

Ans :- Air pressure is high at the Poles.

Q4 :- What is a thunderstorm?

Ans :- A thunderstorm is a type of storm that

is characterised by violent lightning and thunder. It is formed when warm, humid air rises into the colder regions of the atmosphere on a large scale.

Q5:- How is lightning produced?

Ans:- The movement of water droplets and ice in the clouds leads to the accumulation of electricity in the clouds. When this electricity travels within or between clouds or from the clouds to the Earth, a bright streak of light called lightning is produced.

Q6:- What is a cyclone?

Ans:- A cyclone is a powerful storm that is accompanied by circular winds and heavy rainfall. It develops over the warm waters of a sea or ocean.

Q8:- What is the function of the lightning conductor?

Ans:- A lightning conductor is a metal rod mounted on a structure and intended to protect the structure from a lightning strike.

→ Long Answer Questions:-

E. Answer in detail.

Q1:- Explain how temperature differences result in the movement of air.

Ans:- The sunlight heats the surface of the Earth. The air near the surface also becomes warm and becomes less dense. The warm air rises, thus reducing the temperature. Air moves from regions of

high pressure to regions of low pressure so that the pressure is equalised. Because of this, cool air from the surroundings, which is at a higher pressure, rushes in to the area of low air pressure and takes the place of the warm air. This equalises the atmospheric pressure. This is how movement of air takes place.

Q2:- What is Lift? With the help of an experiment, describe how it occurs.

Ans:- When air is blown above the sheet of paper, the pressure above the sheet decreases. The pressure under the sheet of paper is higher than the pressure above the paper. Thus, the paper is lifted by the higher pressure under it. This phenomenon is called Lift.

Aim :- To observe lift due to moving air.

Materials required :- a small sheet of paper, two table-tennis balls, a drinking straw, string.

Method :- Hold the sheet of paper horizontally in front of your mouth and blow hard just above it. Suspend the table-tennis balls using string as shown in the figure. Blow through a drinking straw between the two balls.

Observations :- We will observe that the sheet of paper is lifted up. We will also find that the two balls move closer together.

→ Draw Fig 15.5 and Fig 15.4 on Pg. no 174 on book

Q3:- Draw a labelled diagram and explain the wind patterns on the Earth.

Ans:- The winds are deflected to the right in the northern hemisphere and to the left in the southern hemisphere due to the rotation of the Earth. Because of this, storms and cyclones rotate in the anti-clockwise direction in the northern hemisphere and in the clockwise direction in the southern hemisphere.

→ Draw Fig 15.6 (Global wind flow patterns) on Pg. no 175 on book.

Q4:- Explain how the monsoons of India are formed.

Ans:- The Indian mainland is near the equator. During the summer, the land is heated greatly. This causes the warming up and expansion of the air over the mainland. The warm air rises up and cooler, moisture-laden air from above the seas moves in over the land, bringing heavy rains. This movement of cooler air takes place in a southwest to northeast direction and is hence called the southwest monsoon.

After September, when the intensity of sunshine decreases, the winds blow in the opposite direction. This is the northeast monsoon.

Q5:- Explain how a cyclone develops.

Ans:- When the water vapour in humid air condenses, heat is released. This warms the air, which expands, becomes less dense and rises. The rising of warm

moisture-laden air and the entry of colder air from the surrounding areas leads to the formation of a weak circulation. This becomes stronger under certain conditions and is called a depression, which can eventually strengthen into a cyclone.

Q6:- Write a short note on tornadoes and their effects?

Ans:- A tornado is a narrow funnel-like column of air rotating at high speed that forms between a storm cloud and the ground.

Tornadoes effect the environment by destroying buildings and trees. Tornadoes also kill animals, which effects the food chain and disrupts the whole environment. Tornadoes destroy our farms, which means there will be food shortage around the surrounding area.

Q7:- List the articles you will pack when there is a cyclone warning given in your region.

Ans:- Emergency kit that contains water, dry food, a torch, extra batteries, a first aid kit, medication and emergency contact information.

Q8:- What precautions should you take during and after a storm?

Ans:- During a storm:-

1. Evacuate your home if it is in a low-lying area or if you are asked to do so by officials.
2. Do not use electrical devices and telephones

during the storm.

3. If you are outside during a storm, donot take shelter under trees. Lightning usually strikes tall structures.

After a storm:-

1. Donot try to wade through flooded roads. The depth of the floodwaters might be more than you expect.

2. Donot touch or go near broken cables since they may still carry electricity and give you an electric shock.

3. Listen to the radio for information about storm damage and the relief measures that are being taken.

→ Objective Type Questions:-

Multiple choice Questions:-

A. Choose the correct option.

Key:-

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

B. Fill in the blanks:-

1. anemometer	4. temperature	7. eye
2. rises up	5. monsoon	8. cyclone.
3. difference	6. depression, cyclone	

C. Say whether the statements are true or false.

1. False
2. False
3. True
4. True
5. True.

Topic :- Light

Lesson no :- 16

→ Short Answer Questions:-

D. Answer in brief.

Q1:- What is a real image?

Ans:- A real image is formed by the actual intersection of reflected light rays and can be formed on a screen.

Q2:- What is a virtual image?

Ans:- A virtual image is formed by the intersection of reflected light rays when extended behind the mirror and not by their actual intersection.

Q3:- What is meant by lateral inversion?

Ans:- The phenomenon in which the left side of an object appears to be on the right in the mirror and the right side of an object appears to be on the left in the mirror is called lateral inversion.

Q4:- What is the 'principal focus' of (i) concave mirror and (ii) convex mirror?

Ans:- (i) Take a small concave mirror. Allow some rays of

sunlight to fall on it. Since these rays come from a great distance they are considered to be parallel to eachother. Move a paper screen in front of the mirror. We will see that at a certain point, a clear image of the Sun is obtained. This point is known as the principal focus of the concave mirror.

(iii) A convex mirror on which sunrays fall doesnot produce any image on a screen. However, a diminished virtual image of the Sun can be seen in the mirror. Rays of light appear to diverge from the point where this image is formed after reflection. This point is the principal focus (F) of the convex mirror. The focus is virtual for a convex mirror.

Q5:- Which kind of mirror/mirrors can give the following kinds of images?

(i) real, virtual and magnified

Ans:- Concave mirror

(ii) Virtual and diminished only

Ans:- Convex mirror

(iii) Virtual and erect

Ans:- Convex / Plane mirror

(iv) Laterally inverted

Ans:- Plane mirror

Q6:- What is dispersion?

Ans:- The splitting of white light into separate colours when it passes through a prism is called dispersion.

→ Long Answer Questions:-

E. Answer in detail.

Q1:- Distinguish between regular and irregular reflection.

Ans:-

Regular reflection	Irregular reflection
In a regular reflection, reflecting surface is smooth and well polished and the rays of light that fall on it are all reflected in the same direction.	In the irregular reflection, the reflecting surface is irregular or rough and the rays of light that fall on it are scattered in all directions.

→ Draw Fig 16.4 (a) Regular reflection (b) Irregular reflection on Pg. no 185 on book.

Q2:- What are the characteristics of images formed by a plane mirror?

Ans:- The image formed by a plane mirror is:

- The object and its image are equidistant from the mirror.
- Image is virtual and erect.
- Image is of the same size as the object.
- It is laterally inverted.

Q3:- Distinguish between concave and convex mirrors.

Ans:-

Concave mirror	Convex mirror
• In a concave mirror, the outer surface of the spherical mirror is silvered.	• In a convex mirror, the inner surface of the spherical mirror is silvered.

• The image formed by a convex mirror is inverted and may be real or virtual, and diminished, enlarged or of the same size as the object, depending on the distance of the object from the mirror	• A convex mirror always forms a virtual, diminished, erect image of an object.

Q4:- How can you experimentally locate the principal focus of a concave mirror?

Ans:- Take a small concave mirror. Allow some rays of sunlight to fall on it. Since these rays come from a great distance they are considered to be parallel to eachother. Move a paper screen in front of the mirror. We will see that, at a certain point, a clear image of the sun is obtained. This point is known as the principal focus (F) of the concave mirror.

Q5:- What are the uses of spherical mirrors?

Ans:- The uses of spherical mirrors are:-

1. Concave mirrors are used as shaving mirrors and as mirrors in compacts so that erect, enlarged images of the face are formed.

2. They are used in the headlights of vehicles, torches, searchlights and projectors.

3. The convex mirror has a wide field of view and hence is used as a rearview or driving mirror in vehicles, to view the traffic behind.

4. Convex mirrors are used in street lights as reflectors to spread light over a larger area.

5. They are also used by security personnel to watch over a large area.

Q7:- Draw diagrams showing image formation by the following, indicating the optical centre, principal axis, principal focus and focal length:
(i) a concave lens and (ii) a convex lens.

Ans:- Draw Fig 16.12 [The optical centre, principal axis, principal focus and focal length of lenses (a) convex lens (b) concave lens] on Pg. no 191 on book.

→ Objective Type Questions:-

Multiple choice Questions.

A. Chose the correct option.

1. d
2. b
3. b
4. C
5. a
6. b
7. d
8. a
9. d
10. b

B. Fill in the blanks:-

1. regular
2. Plane mirror
3. centre of curvature
4. diverge
5. Virtual
6. Concave
7. converging
8. optical centre
9. converge
10. Virtual, real

C. Say whether the statements are true or false.

1. False
2. False
3. True
4. True
5. False
6. False
7. False
8. False

Topic :- Water

Lesson no :- 17

→ Short answer Questions :-

D. Answer in brief.

Q1 :- List three processes in the human body which require the presence of water.

Ans :- The three processes in the human body which require the presence of water are digestion, Transportation and Excretion.

Q2 :- Name the three states of water and the temperature range within which each exists.

Ans :- Water exists in all three states — solid, liquid and gas — at different temperatures.

- At 0°C and below, water exists in the solid state as ice.
- Between 0°C and 100°C, water exists mostly in the liquid state.
- At 100°C and above, water exists in the gaseous state as steam.

Q3 :- What is meant by the condensation of water?

Ans :- Condensation is the process by which water vapour changes into water by cooling.

Q4 :- What is meant by the water cycle?

Ans :- The cyclic pattern in which water moves from the oceans and seas to the air as water vapour,

from the air to the land as rain or snow and from land to the oceans and seas as surface water is known as the water cycle.

Q5:- What role does seawater play in the water cycle?

Ans:- The oceans or sea covers a major part of water because 97.4% of water is ocean water. Water vapour mainly forms by ocean or sea and river water so it plays a very important role in water cycle.

Q6:- What is ground water?

Ans:- Groundwater is the water that has seeped through the topsoil and collected over non-porous rocks under the surface.

Q7:- What is drip irrigation?

Ans:- Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface.

Q8:- Is prevention of water pollution a part of water conservation? Give reasons.

Ans:- Yes, prevention of water pollution is a part of water conservation because if we prevent water from pollution then we conserve it in the form of fresh water for survival.

Q9: How do dams help with water conservation?

Ans:- Dams store excess water during the monsoons. This prevents floods and conserves water for the dry season. This water can be used for irrigation, domestic purposes and electricity generation.

→ Long Answer Questions:-

Q2:- How is water useful to plants?

Ans:- The following are some ways in which water is essential to plants.

1. Water is essential for the germination of seeds.
2. Water acts as a medium for transporting nutrients to the different parts of a plant.
3. Green leaves use water and carbondioxide to prepare food in the presence of sunlight through photosynthesis.

Q3:- With the help of a labelled diagram, explain the water cycle in nature.

Ans:- Water constantly evaporates from oceans, seas, rivers and other water bodies due to the heat in sunlight. The water vapour rises up in the atmosphere. The higher levels of the atmosphere are cooler and so the water vapour condenses to form tiny droplets of water. These tiny droplets form clouds.

When the temperature drops further in some places, the tiny water droplets join to form bigger drops. When the drops become heavy enough they

fall down to the Earth as rain, hail or snow. Some of the water that falls on the land flows back to the oceans and seas through rivers and streams. Thus there is constant movement of water from the various sources through the water cycle.

→ Draw Fig 17.7 (The water cycle) on Pg.no 201 on book.

Q4:- What are the main causes for the scarcity of water?

Ans:- Scarcity of water is a matter of growing concern in India and worldwide. The main factors for this are the following:-

1. The population:- An increased population has increased the demand on water for drinking, cooking, washing and other household activities. Also, the increase in concrete surfaces has decreased the amount of area available for the percolation of water into the soil. This has led to a fall in the water table.

2. Industries:- Industries use large amounts of water for their activities, like transport, cooling of machines and so on..

3. Agriculture:- Farmers are under pressure to increase food production for increasing population. In many parts of India, they depend heavily on groundwater to irrigate their fields because of drought or

because the rains may be either late or insufficient. The crop will die if enough water is not available at the right time.

4. Deforestation :- Large areas of forests have been cleared to get more land to grow crops, to build houses and to build factories. Cutting down forests thus reduces the amount of rain and also the absorption of water by the soil.

Q5 :- What is afforestation and how is it useful in conserving water?

Ans :- Planting of trees in large numbers is known as afforestation.

Afforestation helps to increase rainfall and the roots of the trees help to stop the flow of water and thus increase percolation of water in the soil.

Q6 :- Explain how rooftop rainwater harvesting is carried out, with the help of a diagram.

Ans :- In rooftop rainwater harvesting, the rainwater that falls on the roofs of houses is made to flow through pipes into an underground tank. The tank has an earthen floor filled with different layers of coarse gravel, broken bricks and sand. These layers filter out any silt in the water. The earthen floor helps in the percolation of water into the soil. This recharges

the groundwater and helps to raise the water table.

→ Draw Fig 17.12 (Rainwater harvesting) on Pg. no 204 of book.

→ Objective Type Questions:-

Multiple Choice Questions.

A:- Chose the correct option.

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

B:- Fill in the blanks.

1. 60 %
2. groundwater
3. percolation
4. conservation
5. drip

C:- Say whether the statements are true or false.

1. False
2. True
3. True
4. False
5. False
6. True
7. False
8. False

Lesson no :- 18

Topic :- Forests — Our Lifeline

→ Short answer Questions :-

D. Answer in brief.

Q1 :- What is a forest?

Ans :- A forest is large area of land covered with trees, shrubs and other vegetation.

Q2 :- Under what conditions are tropical rainforests usually found?

Ans :- Tropical rainforests are found in tropical regions where the rainfall is high throughout the year.

Q3 :- Why is the understorey of a forest always in constant shade?

Ans :- The understorey is the layer that is below the canopy. The understorey gets only a small amount of sunlight since the canopy blocks most of it. That is why the understorey of a forest always is in constant shade.

Q4 :- What are scavengers?

Ans :- Scavengers are animals that eat the dead bodies of other animals or plants e.g. vulture, hyena etc.

Q5 :- What is a food chain?

Ans :- A food chain is a sequence of organisms that are each dependent on the previous organism for food. It shows the interdependence of organisms on

eachother.

Q6:- Explain what is meant by predator and prey.

Ans:- Animals that hunt and kill other animals for food are called predators and the animals that are hunted or killed by animals are known as Prey.

Q7:- How do forests increase rainfall?

Ans:- Forests cool the atmosphere because of transpiration. Transpiration also helps to increase humidity in the air. This helps in the formation of clouds which leads to increased rainfall.

Q8:- When forests are cut, soil erosion occurs. Why?

Ans:- When forests are cut, soil erosion occurs because roots of plants and trees hold the soil and prevent it from being eroded by water or wind and when we cut them, the soil becomes loose and is eroded.

Q9:- Name four products that we get from forests.

Ans:- Forests provide many useful products like timber, medicines from neem, cinchona and wood pulp for making paper.

→ Long answer Questions:-

E. Answer in detail.

Q1:- Describe the different layers of a rainforest.

Ans:- Rainforest have four distinct layers — the overstorey or the emergent layer, the canopy, the

understorey and the forest floor.

1. Emergent layer:- It is the top layer of the rainforest. It is the tallest layer of the rainforest and consists of very tall trees (50 m and more in height). The trees in this layer receive maximum sunlight and face high wind speeds.

2. Canopy:- The canopy is the second tallest layer of the rainforest. It is formed by trees that grow to a height of 20-40 m. The canopy protects the layers and ground below from direct sunlight, wind and direct rainfall.

3. Understorey:- The understorey is the layer that is below the canopy. The understorey gets only a small amount of sunlight since the canopy blocks most of it.

4. Forest floor:- The forest floor is the lowermost and darkest layer of the forest. Very few bushes and herbs can grow on the forest floor because almost no sunlight reaches here, and so the forest floor is relatively clear.

Q3:- What are decomposers? Explain the role that they play in a forest.

Ans:- Decomposers are organisms that help to break down the dead bodies of plants and animals into nutrients. e.g. bacteria and fungi.

The role of the decomposers is very important, since forests would not be able to survive if nutrients were not returned to the soil.

Q4:- In what ways are plants dependent on animals?

Ans:- Plants are dependent on animals by the following ways:-

1. Plants depend on insects like the bee and other animals for pollination and also for seed dispersal.
2. Insectivorous plants trap insects to fulfill their nutritional requirements.
3. Animals breathe out carbondioxide. Plants use carbondioxide to make food.

Q5:- Explain a food web with an example.

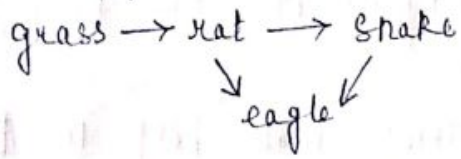
Ans:- A food web consists of several interlinked food chains in a habitat.

In a habitat containing a large number of organisms, an animal becomes a part of more than one food chain. For example, consider the food chains:

grass → rat → eagle

grass → rat → snake → eagle

We can see that the rat is a part of both food chains and a snake can also be eaten by an eagle. The two food chains can be combined.



There are organisms other than the rat that eat plants. There are also other animals that eat the rat. Thus, a number of food chains link up in a habitat to form a complicated food web.

→ Draw Fig 10.6 (An example of food web) on Pg. no 215

Q6:- How are the populations of organisms in the environment kept under control?

Ans:- Food webs make sure that the populations of different organisms in a habitat remain steady. e.g. If the population of rats in a habitat increases, plenty of food will then be available for eagles and snakes. Their population will also increase. They will eat more and more rats. This will cause the rat population to reduce. Once this happens, the food available for snakes and eagles will reduce and their population will again reduce.

Q7:- Why are forests considered a very important natural resource?

Ans:- Forests are considered a very important natural resource because of the following reasons:-

1. Forests provide food and shelter for animals.
2. Forests provide oxygen.
3. Forests absorb carbondioxide from the air during photosynthesis. This helps lower the level of carbondioxide in the air.
4. Forests cool the atmosphere because of transpiration.
5. Forests prevent soil erosion.

Q8:- What are the reasons for deforestation?

Ans:- Land gets scarce as the population grows. The more the population, the more is the demand for houses, roads, fuel, wood and other products like paper, medicines etc. To fulfill these demands, forests are cleared to make space and to get timber. Increased human population and modernization has resulted in the

cutting down of forests on a large scale.

Q9:- List four methods that can be used for preserving forests?

Ans:- We should preserve forest resources by the following actions.

1. Controlling the cutting of trees in forests.
2. Planting trees (afforestation) to cover vast areas of land.
3. Preventing overgrazing by cattle, sheep, goats and other animals.
4. Preventing forest fires that are not natural.

→ Objective Type Questions:-

Multiple Choice Questions.

A. Chose the correct option.

1. c	5. a	9. b
2. c	6. c	10. b
3. c	7. a	
4. c	8. d	

B. Fill in the blanks.

1. overstorey or the emergent.
2. Secondary
3. Consumers or heterotrophs
4. Web
5. nutrients
6. oxygen
7. oxygen
8. erosion

C. Say whether the statements are true or false.

1. True
2. False
3. False
4. False
5. False
6. False
7. False
8. False

Lesson no :- 19

Topic :- Waste Water Management.

→ Objective Type Questions :-

Multiple choice Questions.

A. Choose the correct option.

1. d
2. d
3. b
4. d
5. c

B. Give one word for the following :-

1. Sewage
2. Skimmer
3. Methane

C. Say whether the statements are true or false.

1. False
2. False
3. True
4. False
5. True
6. True