

PONY

سلسلة كتب الاستاذ

SCIENCE

2029

FINAL

REVISION

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4

PRIMARY
FIRST TERM

Concept

1.1

Adaptation and Survival

Evaluation Weeks 1, 2, & 3

Q1

Choose the correct answer:

- Polar bears have white fur to
a. live in the desert
b. see in the dark
c. stay warm
d. hide from predators or prey
- A penguin's feet stay warm due to its
a. fat layer
b. blood vessels
c. features
d. fur
- A panther chameleon changes its color to blend with the surrounding environment, this is known as
a. echolocation
b. respiration
c. camouflage
d. digestion
- Bull sharks can survive or live in
a. fresh water only
b. salt water only
c. both fresh and salt water
d. seas, rivers, and mud
- In a penguin's body, dense feathers and the thick layer of fat help the penguin to be
a. warm
b. cold
c. predator
d. prey
- An example of a behavioral adaptation in panther chameleons is
a. having a long and sticky tongue
b. puffing up its body when in danger
c. having V-shaped feet
d. having brightly colored scales
- The thick, white fur is a type of adaptation in
a. panther chameleons
b. polar bears
c. fennec foxes
d. caracals
- A fennec fox has to enable blending in the desert.
a. dark colored fur
b. thick, white fur
c. sandy-colored fur
d. colored scales
- Adaptations help living organisms to
a. go extinct
b. survive
c. reproduce
d. both b and c
- Camouflage means that an organism is
a. easy to be seen by predators
b. difficult to be seen
c. easy to be seen by the prey
d. easy to be eaten

- 11 The penguin's feet stay warm due to
- the movement of blood in its blood vessels
 - the thick layers of fat
 - the dense feathers
 - the dense fur
- 12 A Barbary fig has to prevent animals from eating it.
- roots
 - a soft stem
 - sharp spines
 - colored leaves
- 13 The long roots in acacia trees is considered a adaptation.
- structural
 - behavioral
 - physiological
 - both structural and behavioral
- 14 grow in the desert.
- Acacia trees
 - Palm trees
 - Water lilies
 - Mangrove trees
- 15 An organ which mixes food with saliva and crushes it with the teeth is the
- mouth
 - stomach
 - small intestine
 - pharynx
- 16 An organ that stores undigested food and expels it out from the body is the
- esophagus
 - large intestines
 - stomach
 - small intestines
- 17 The leaves in the tree change into needles to prevent it from losing water.
- acacia
 - kapok
 - pine
 - mangrove
- 18 Producing poison in acacia trees is considered a adaptation.
- structural
 - behavioral
 - physiological
 - both structural and behavioral
- 19 trees grow in salt water.
- Kapok
 - Palm
 - Mangrove
 - Pine
- 20 The digestive system starts with the
- Throat
 - nose
 - anus
 - mouth
- 21 Carbon dioxide is a gas to the body if we don't get rid of it.
- beneficial
 - harmful
 - useful
 - a and c

- 7 An ecosystem can be restored by eliminating pollution. (✓)
- 8 The bodies of amphibians are covered with skin that allows water and gas to pass through. (✓)
- 9 The Egyptian frog lives in ponds and streams. (✓)
- 10 Fish breathe through the lungs. (X)
- 11 Inhaled air is rich in carbon dioxide. (X)
- 12 Carbon dioxide gas is expelled from the body during exhalation. (✓)
- 13 Fish need clean and pure water to survive. (✓)
- 14 Frogs can breathe through the lungs. (✓)
- 15 Cutting down forests can cause environmental changes. (✓)

Q3

Complete the following sentences:

- 1 An organ that pushes the food to the stomach is the **esophagus**.
- 2 The muscle that helps in respiration process is the **diaphragm**.
- 3 Amphibians breathe using their **lungs** and **skin**.
- 4 Some of the changes that affect ecosystems are **cutting down trees** and **air pollution**.
- 5 During exhalation, **carbon dioxide** gas is released, while during inhalation, **oxygen** gas is taken in.
- 6 The diaphragm moves upward during **exhalation** and downward during **inhalation**.
- 7 The pharynx is an organ of the **digestive/respiratory** system, while the lungs are organs of the **respiratory** system.
- 8 Fish extract the **oxygen** gas dissolved in water, and humans use this gas during the **inhalation** process.
- 9 **White fur** helps polar animals hide in the snow.
- 10 Bull sharks live in **fresh and salt water**.
- 11 **Buttress roots** help the kapok tree to hold in the soil.
- 12 **The mouth** is among the organs of the digestive system.
- 13 **The nose** is among the organs of the respiratory system.
- 14 The gills in fish are considered a **structural** adaptation.
- 15 Animals that can live both in water and on land are called **amphibians**.

Q4 Write the scientific term:

- 1 It is a type of adaptation that helps animals hide from a predator or sneak up on its prey. (Camouflage)
- 2 They are characteristics that help living organisms survive and reproduce in the ecosystem. (Adaptations)
- 3 It is a change in the structure of an animal's body. (Structural adaptation)
- 4 It is a process in which the lungs expand and fill with air. (Inhalation process)
- 5 It is the system responsible for getting rid of harmful air from the body. (Respiratory system)
- 6 It consists of organs that work together. (System)
- 7 They are trees that grow in Amazon rainforests. (Kapok trees)
- 8 It is a tree that can live and survive securely in water. (Mangrove tree)
- 9 It is a tree that lives in Savannah forests. (Acacia tree)
- 10 They are animals that can live on both land and water. (Amphibians)
- 11 It is the continuous decrease in the number of individuals of an organism until the death of all its members. (Extinction)
- 12 They are special organs in fish that allow them to extract the oxygen dissolved in water and remove carbon dioxide. (Gills)
- 13 They are organs in humans that work to extract oxygen from the air. (Lungs)
- 14 It is a pollution caused by the exhausts of cars and factories. (Air pollution)

Q5 What is meant by:

Camouflage

It is a type of adaptation that helps animals hide from a predator or sneak up on their prey.

Q6 Determine the type of adaptation in the following:

- 1 Panther chameleons have V-shaped feet. (Structural adaptation)
- 2 Fennec foxes live in burrows to stay cool. (Behavioral adaptation)
- 3 Polar bears have thick white fur. (Structural adaptation)
- 4 A panther chameleon puffs up its body to look fierce. (Behavioral adaptation)

- 5 Bull sharks hunt in the day as well as the night. (**Behavioral adaptation**)

Q7

Give an example of:

- 1 An adaptation that enables an animal to hide in its environment.

A polar bear has white fur to hide in snow.

- 2 A structural adaptation of living organisms.

Penguins have a thick fat layer and dense feathers.

- 3 A behavioral adaptation in acacia trees.

Acacia trees produce poison to make the leaves taste very bad.

- 4 A behavioral adaptation in kapok trees.

They can send smelly messages by wind to attract bats.

- 5 A structural adaptation in water lilies.

Water lilies have wide leaves floating on water.

Q8

Answer the following questions:

- 1 Determine some human activities that negatively affect the air.

Cutting down trees – Farming and clearing lands

- 2 Determine some human activities that negatively affect the water.

Water pollution – Throwing waste in waterways

- 3 Determine some human activities that negatively affect the soil.

Cutting down trees – Throwing waste in soil

- 4 Explain how amphibians adapt to the environment.

On land: Amphibians breathe oxygen through their lungs.

In water: Amphibians breathe the oxygen dissolved in water through their skin.

- 5 Mention the role of the diaphragm in the respiratory process.

During inhalation, the air rich in oxygen enter the lungs, and the diaphragm moves down.

During exhalation, carbon dioxide is expelled out of the lungs, and the diaphragm moves up.

Q9

Give reasons for:

- 1 A fennec fox has sandy-colored fur.

To blend in with the sand of the desert and make camouflage.

- 2 A penguin is covered with dense feathers.

To keep its body warm.

- 3 A fennec fox has extra-large ears.

To keep its body cool and to lose heat.

- 4 Palm trees have long and strong roots.

To resist strong winds.

- 5 Animals don't eat acacia trees' leaves.

Because their leaves have sharp spines.

- 6 A Barbary fig has spiny leaves.

To prevent animals from eating its leaves and fruits.

- 7 A kapok tree stay upright in the soggy soil.

Because it has buttress roots that fix it in the soggy soil

- 8 Water lilies have wide leaves.

To float on water and absorb large amounts of sunlight.

- 9 A pine tree has a triangular shape.

To allow snow to slide easily over it without breaking its branches.

- 10 Fish die when they leave the water.

Because they breathe in oxygen gas from the water through their gills.

- 11 Humans must replant forests that they cut.

To restore the ecosystem and decrease pollution.

- 12 Humans and fish are similar in some characteristics.

Both of them breathe in oxygen gas and breathe out carbon dioxide gas.

- 13 Amphibians can live both in water and on land.

Because on land they can breathe using their lungs and in water they can breathe through their skin.

Q10

What happens if:

- 1 The panther chameleon has no V-shaped feet?

It can't hold the branches of the tree.

- 2 Living organisms cannot adapt with environmental or ecosystem changes?

They can't survive or reproduce.

- 3 A fennec fox has short ears?

It can't cool its body and can't hear the prey.

- 4 The Arctic fox doesn't have thick white fur?

It can't keep its body warm and can't hide in the snow.

- 5 Humans don't chew the food?

Swallowing of food would be difficult, so the digestive system can't digest the food well.

- 6 You stop breathing for a long time?

You will die because you need oxygen gas to get energy to survive and grow.

- 7 A plant was transferred from one environment to another?

It may adapt to the new environment or it can't survive.

- 8 Palm trees have no thick and strong roots?

They can't resist strong wind, so the wind will damage them.

- 9 Acacia trees don't produce a poison?

The giraffe will eat its leaves easily.

- 10 Humans' lungs are replaced by gills?

Humans could breathe the dissolved oxygen from water.

- 11 People cut down forests and plow grasslands?

Oxygen gas will decrease, so air pollution will increase.

12 Many communities are built and agriculture is neglected?

Oxygen gas decreases, so air pollution increases.

13 Saliva is not secreted during digestion?

Food can't be moistened and the swallowing of food becomes difficult.

14 The small intestine is not part of the digestive system?

The digestion process can't happen, so the body can't get nutrients to get energy.

PONY

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Q1 Choose the correct answer:

- 1 The main control center of the body is the
 a. nerves b. **brain** c. spinal cord d. stomach
- 2 Echolocation helps dolphins identify the of their prey.
 a. color b. **location** c. smell d. taste
- 3 Feeling hot or cold depends on the sensory receptors in the
 a. **skin** b. eyes c. ears d. stomach
- 4 The organ that processes the information collected from the eyes is the
 a. eye b. spinal cord c. nerves d. **brain**
- 5 The time it takes for the body to react to different information (danger) is called the time.
 a. absorption b. digestion c. **reaction** d. respiration
- 6 Ants communicate with each other using
 a. sight b. **smell** c. touch d. hearing
- 7 The system collects information about what is happening inside and outside the body.
 a. respiratory b. digestive c. **nervous** d. urinary
- 8 Some messages are sent by the nervous system so fast that you are barely aware of them; these are known as
 a. heart b. brain c. **reflexes** d. stomach
- 9 A blind person's cane emits to tell him the directions.
 a. smells b. lights c. **vibrations** d. tones
- 10 Humpback whales communicate with each other through
 a. dancing b. flashing c. **singing** d. light
- 11 Sensory receptors collect information from the surroundings and send it to the for processing.
 a. lungs b. spinal cord c. nerves d. **brain**
- 12 The is the organ responsible for hearing.
 a. eye b. **ear** c. tongue d. mouth

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- 13 The system receives and translates information.
a. digestive b. **nervous** c. respiratory d. urinary
- 14 Sharp sounds are-pitched sounds.
a. no b. low c. medium d. **high**

Q2

Put (✓) or (X):

- 1 Dolphins have a stronger sense of hearing than humans. (✓)
- 2 Bats rely on echolocation to find food. (✓)
- 3 The spinal cord is the main control center in the human body. (X)
- 4 We can differentiate between hot and cold objects using the digestive system. (X)
- 5 Animals that are active at night are called nocturnal animals. (✓)
- 6 Ants can communicate with each other by singing. (X)
- 7 Egyptian jerboas depend on echolocation to find food. (X)
- 8 The brain is the main control center in the human body. (✓)
- 9 We can differentiate between hot and cold objects by the sensory receptors. (✓)
- 10 The scientific idea of a blind person's cane is echolocation. (✓)

Q3

Complete the following sentences:

- 1 The nervous system consists of the **brain**, **spinal cord**, and **nerves**.
- 2 **Bats** and **owls** are examples of nocturnal animals.
- 3 Among the organisms that have the ability to locate their prey by echolocation are **bats** and **dolphins**.
- 4 The brain is part of the **nervous** system.
- 5 The **brain** is like the command for the human body.
- 6 **Nerves** send(s) messages to the brain.
- 7 Dolphins use **echolocation** to know the location of their prey.
- 8 The **brain** processes and interprets data.

Q4

Complete the following sentences using the words between the brackets:

(nerves – echolocation – smelly messages – brain – hearing)

- 1 When the Egyptian jerboa feels danger, the brain sends messages to its legs through the **nerves**.
- 2 Ants communicate with each other by sending **smelly messages**.
- 3 Bats can locate their prey using **echolocation**.
- 4 Sense organs collect information from the surroundings and send it to the **brain** to be interpreted.
- 5 Humpback whales communicate with each other through **hearing**.

Q5

Write the scientific term:

- 1 It is the property by which dolphins and bats can locate their prey. (Echolocation)
- 2 They are animals that are active at night. (Nocturnal animals)
- 3 It is the body system that controls all body functions and nerves are part of it. (Nervous system)
- 4 It is a bird that can turn its head backwards and has a bowl-shaped head with large eyes. (Owl)
- 5 It is the main control unit in the human body. (Brain)
- 6 They are nerves connected directly to the brain. (Eyes nerves)
- 7 It is a property used in blind people canes to help them detect their surroundings. (Echolocation)
- 8 It is the time taken by the body to react to different information, such as danger. (Reaction time – Response time)
- 9 It is the time taken by the body to receive information from the environment. (Reaction time)
- 10 They are organisms that communicate with each other through the sense of smell. (Ants)

Q6 What is meant by:

- Response time

It is the time taken by a living organism's body to respond to danger.

Q7 Mention one function of:

- 1 The brain in the human body.
It is the main control center of the body that translates information and tells the body what to do.
- 2 The spinal cord in the human body.
It carries messages from the brain to body parts and vice versa.
- 3 The nerves in the human body.
They carry messages from the brain to the spinal cord and body parts and vice versa.
- 4 The nervous system in the human body.
It helps the body avoid danger - It gathers information from the environment.
- 5 The cane used by a blind person.
It helps the blind person to walk safely by changing the echo into vibrations that blind person can detect it using touch.

Q8 Mention the similarities between a bat and a blind person cane:

Both of them make echolocation to locate objects:

- They produce high-pitched sounds.
- They depend on echo to locate objects.

Q9 Explain how a bat uses echolocation:

- A bat produces sound waves in the air.
- When the sound waves hit an object, they return back in the form of an echo.
- The bat can detect the echo and locate the object using its sharp hearing sense.

Q10

Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 The brain	a. carry messages from the brain to the spinal cord and other parts of the body.
2 Spinal cord	b. is the main control center of the body.
3 Nerves	c. is a big nerve that runs through the backbone.

1 b 2 c 3 a

B

Column (A)	Column (B)
1 Bats	a. send smelly messages to communicate.
2 Humpback whales	b. use echolocation to locate their prey.
3 Ants	c. are desert rodents with long hind legs.
4 Egyptian jerboas	d. can sing underwater to communicate with each other.

1 b 2 d 3 a 4 c

Q11

Give reasons for:

- 1 Bats can locate their prey in the dark.

Because they have a super sense of hearing and depend on echolocation.

- 2 The Egyptian mongoose makes sounds.

To communicate with each other to move together and search for food.

- 3 Dolphins can hear different types of sounds.

Because they have a super sense of hearing.

- 4 Animals that live in hot places become active at night.
Because the weather is cool at night, so the prey will be available at night, and they will surprise their prey.
- 5 Humpback whales sing underwater.
To communicate with each other during mating or feeding seasons.
- 6 A blind person can detect his surroundings.
Because a blind person uses a special cane that depends on echolocation and can change echo into vibrations to allow him to detect his surroundings using touch.
- 7 The Egyptian jerboa jumps quickly when it senses danger.
Because it has long hind legs to jump for a long distance and long ears to hear the snake so it can run away quickly.

Q12

What happens if:

- 1 Owls don't have large ears?
They can't hear the movement of faraway prey.
- 2 Nerves are not part of the human body?
The messages can't be sent between the brain, spinal cord, and body parts and vice versa.
- 3 Animals cannot locate their prey?
They can't hunt the prey and can't get food, so they will die.
- 4 The Egyptian jerboa hears a snake moving towards it?
It jumps (hops) quickly and runs away in less than one second.
- 5 Your hand touches the thorns of a cactus plant?
I move my hand quickly in less than one second.
- 6 The Egyptian jerboa does not have a long leg?
It can't jump long distances to run away quickly.
- 7 The jerboa does not have an ear that is sensitive to sound?
It can't hear the movement of a snake, so it can't jump and run away from danger.
- 8 Humpback whales cannot sing underwater?
They can't communicate with each other.

Concept

1.3

Light and Sight

Evaluation Weeks 6, 7, &

Q1 Choose the correct answer:

- Light is a form of
a. force b. work c. matter d. **energy**
- Which of the following is an opaque object?
a. Air b. Water c. **Wood** d. Glass
- When light falls on a mirror, it is
a. absorbed b. refracted c. scattered d. **reflected**
- Among natural sources of light is the
a. lamp b. moon c. candle d. **Sun**
- If Hossam wants to make a box to see its contents from the outside, which of the following materials can he use?
a. Cardboard b. **Transparent glass**
c. Opaque plastic d. Carton
- Light travels in lines.
a. zigzag b. **straight** c. circular d. curved
- The process of vision occurs as a result of the of light.
a. scattering b. **reflection** c. absorption d. refraction
- Which of the following materials reflect light best?
a. Wood b. Cloth c. **Mirrors** d. Rock
- Man uses to communicate.
a. echolocation b. camouflage
c. **sight and hearing** d. sleeping
- Your eyes use to collect information.
a. sound b. smell c. sound and light d. **light**
- Travelers use to attract the attention of helicopter pilots to rescue them.
a. sound b. **mirrors** c. wood d. food
- Writing and reading are ways to communication between
a. plants b. animals c. **humans** d. ants

Q4 Write the scientific term:

- 1 It is the organ affected by light and responsible for vision. (Eye)
- 2 They are materials that allow light to pass through them. (Transparent objects)
- 3 They are objects through which light is emitted. (Sources of light)
- 4 They are materials that we can't see through. (Opaque objects)
- 5 It is a pattern that has a meaning. (Code)
- 6 They can communicate together by flashing (lighting). (Fireflies)
- 7 It includes raising your thumb up or down. (Code)

Q5 What is meant by:

- Code **It is a pattern that has a meaning.**

Q6 Answer the following questions:

- 1 Mention two examples of codes used by humans in their daily lives.
Thumb up - Thumb down - Language - Writing - Facial expressions
- 2 Explain how bats communicate with each other.
Bats use sound and echolocation to communicate, as bats produce high-pitched sounds that bounce back to them in the form of echo.
- 3 Mention an example of behavioral adaptation in fireflies.
They change the flash pattern to match the flash pattern of another group to communicate.
- 4 Mention one benefit of the flashes emitted by fireflies.
Fireflies use flashes to communicate to warn other fireflies from predators or to attract a mate.

Q7 Give reasons for:

- 1 The moon is not a source of light.
Because the moon doesn't emit light, but it reflects the sunlight falling on it.
- 2 Fireflies emit a luminous flash.
To communicate together and warn other fireflies from predators or to attract a mate to reproduce.

- 3 Humans sometimes use codes.
To communicate and transmit information.
- 4 Glass is a transparent material.
Because glass allows light to pass through it and objects can be seen through it.
- 5 Wood is an opaque material.
Because wood doesn't allow light to pass through it and objects can't be seen through it.

Q8

What happens if:

- 1 Light falls on a rough surface, such as wood or paper?
Light is reflected in different directions.
- 2 Light falls on a smooth surface, such as a mirror?
Light is reflected in the same direction.
- 3 The backcountry hikers do not have mirrors?
They can't attract the attention of rescue helicopters.
- 4 Codes have no meaning?
The brain can't decode and interpret the meaning
- 5 Fireflies do not emit flashes?
**They can't communicate with each other.
They can't warn other fireflies from predators.
They can't attract a mate to reproduce.**

Concept

2.1

Starting and Stopping

Evaluation Weeks 9 & 10

Q1

Put (✓) or (X):

- 1 Objects do not move if no force affects them. (✓)
- 2 The body is static when it moves from one place to another. (X)
- 3 The engine of a jet plane is weaker than the engine of a car. (X)
- 4 The movement of planets can be seen in the sky. (X)
- 5 Friction acts in the same direction of the motion of the body. (X)
- 6 If a balanced force acts on a body, it moves. (X)
- 7 Opening the desk drawer is a pulling force. (✓)
- 8 An object moves a greater distance if a greater pushing force is exerted on it. (✓)

Q2

Complete the following sentences:

- 1 The body whose position does not change is in a static state.
- 2 Force causes the movement of static bodies.
- 3 The fastest truck in the world is the Shockwave truck.
- 4 The Shockwave truck is stopped by 3 parachutes.
- 5 Opening the door handle is a pulling force.
- 6 The speeds of trucks differ according to the power and number of engines.
- 7 Kicking the ball is a pushing force, while tightening the hook is a pulling force.
- 8 There are two types of forces: pushing and pulling forces.
- 9 A moving object is acted on by unbalanced forces, while a body at rest is acted on by balanced forces.
- 10 There are two types of forces: balanced and unbalanced.
- 11 An apple falling from a tree is caused by the pulling force of gravity, while kicking a ball is an example of a pushing force.
- 12 When an unbalanced force acts on a body, it moves toward the greater force (changes its position).
- 13 An apple falling from the tree is caused by the force of gravity.

- 14 When a force acts against the direction of motion of an object, its speed **decreases**.
- 15 An object moves when an **unbalanced** force acts on it.

Q3 Write the scientific term:

- 1 It is the change in the place of the body from one place to another. **(Motion)**
- 2 It is a force that pulls objects down toward the Earth. **(Gravity)**
- 3 It is the amount of energy required to move an object through the force acting on it. **(Work)**
- 4 It is a force that arises between the surfaces of two bodies in contact. **(Friction force)**
- 5 It is the ability to do work. **(Energy)**

Q4 What is meant by:

- 1 Pushing force
It is a force that you use to move an object away from you.
- 2 Pulling force
It is a force that you use to move an object toward you.
- 3 Movement (Motion)
It is any change in the position of an object relative to a fixed starting point.
- 4 Gravity
It is the force that pulls objects down toward the Earth's center.
- 5 Energy
It is ability to do work or cause a change.
- 6 Force
It is a push or pull that is applied to an object making it change its position.

Q5 Answer the following questions:

- 1 Give an example of an easily seen movement and another that cannot be seen.

We can see a walking person.

We can't see the rotation of Earth around the Sun.

- 2 Give an example of both a pushing force and a pulling force.

Pushing force: Kicking the ball

Pulling force: Gravity pulls objects toward the Earth's center.

- 3 Give an example of an object that is affected by unbalanced forces.

In the tug-of-war game, the rope moves with a greater force when one team pulls the rope with a greater force.

- 4 Mention an example of an object that has balanced forces acting on it.

- You sit on a chair. - A book on the table

- 5 Mention the state of the body when balanced and other unbalanced forces affect it.

Balanced forces: The object will not move.

Unbalanced forces: The object will move toward the greater force.

- 6 Explain the difference in the distance traveled by two cars of different masses.

The small car will move a longer distance.

The big car will move a shorter distance.

Q6 Give reasons for:

- 1 A body does not move when it is acted upon by balanced forces.

Because balanced forces are equal.

- 2 A cart starts moving when the gases come out of the fire extinguishers.

Because the air of the fire extinguisher moves backwards, so the cart moves forward.

- 3 The speed of a jet plane is greater than the speed of a truck.

Because a jet plane has a more powerful engine than a truck.

- 4 The distance traveled by a car varies according to its mass.
Because when the mass of an object increases, the object covers a short distance and vice versa.
- 5 An object moves when unbalanced forces act on it.
Because unbalanced forces are unequal forces, so the object moves toward the greater force.
- 6 The speed of a car decreases when the brakes are applied.
Due to the friction force between the car tires and the road, which slows down the motion of the car.

Q7

What happens if:

- 1 An object is affected by unbalanced forces?
The body moves toward the greater force.
- 2 An object is affected by balanced forces?
It does not move and stays static. سلسلة
- 3 We increase the number of fire extinguishers on the cart?
The speed of the cart increases and the cart covers a longer distance.
- 4 We kick the ball with a certain force?
The ball moves and changes its position.
- 5 We press the brakes of the car?
The speed of the car decreases until it stops because of the friction force between the car tires and the road.

Q1

Put (✓) or (X):

- 1 Kinetic energy is transferred when a moving car collides with another at rest. (✓)
- 2 The kinetic energy of objects increases as their speed increases. (✓)
- 3 A ball at rest on the ground has kinetic energy. (X)
- 4 When a roller coaster reaches the top, it stores kinetic energy. (X)
- 5 When an electric heater is turned on, it produces thermal energy. (✓)
- 6 The energy stored in food is chemical energy. (✓)
- 7 The energy stored in a spring is kinetic energy. (X)
- 8 Electrical energy is converted into light energy in the heater. (X)

Q2

Correct the underlined words:

- 1 A person at the top of a tower has the most kinetic energy. (potential)
- 2 Potential energy is transferred from your foot to the ball when you kick it. (Kinetic)
- 3 The ability to do work or make a change is known as power. (energy)
- 4 Kinetic energy is the energy stored inside the body. (Potential)
- 5 In an electric fan, electrical energy is converted into chemical energy. (kinetic)
- 6 An example of kinetic energy is gravitational energy. (potential)
- 7 An example of potential energy is sound energy. (chemical)
- 8 The gasoline inside a car stores kinetic energy. (chemical)

Q3

Complete the following sentences:

- 1 An object at the top of a hill has no kinetic energy.
- 2 Energy is what affects different objects and makes them change their position.
- 3 The speed of a roller coaster increases as it moves towards the bottom of the ramp.
- 4 Kinetic energy increases as the speed of the object increases.

Final Revision

- 5 The energy used to carry a roller coaster up is **electric energy**.
- 6 When a skateboarder reaches the top of a hill and stops, his kinetic energy is **zero**.
- 7 When you push a small box with your foot, energy is transferred from **your foot** to **the box**.
- 8 A **battery** has chemical potential energy.
- 9 As the mass of an object increases, the **potential** energy increases.
- 10 In a flashlight, **chemical** energy is converted into **light** energy.
- 11 As the height of an object increases, the **potential** energy increases.
- 12 Chemical energy is considered **potential** energy.
- 13 Light energy is considered **kinetic** energy.
- 14 The forms of energy are divided into two main types: **potential energy** and **kinetic energy**.
- 15 When you clap your hands, **kinetic** energy is converted into **sound** energy.
- 16 In an electric fan, **electrical** energy is converted into **kinetic** energy.
- 17 The factors affecting kinetic energy are **the speed** and **the mass**.

Q4 Write the scientific term:

- 1 It is the energy stored inside objects. (Potential energy)
- 2 It is the energy possessed by an object due to its motion. (Kinetic energy)
- 3 It is the energy that gasoline stores inside the car. (Chemical energy)
- 4 It is an energy that includes light energy. (Kinetic energy)
- 5 It is the force that is affected by the heights of objects. (Gravity)

Q5 What is meant by:

- 1 Energy
It is the ability to do work or make a change.
- 2 Kinetic energy
It is the energy of an object due to its motion.
- 3 Potential energy
It is the amount of energy that is stored in an object due to its position.

Q6 Answer the following questions:

1 Mention the type of energy in the following:

a. A book on a table.

Gravitational potential energy

b. The energy stored in batteries.

Chemical potential energy

2 Mention one form of kinetic energy.

Movement of sound waves in the air – Movement of light waves in the air

3 Mention one form of potential energy.

Gravitational potential energy – Chemical potential energy

Q7 Give reasons for:

1 A book on the table has energy.

Because it is placed on a height from the Earth's surface, so it has potential energy.

2 The food we eat has energy.

Because it stores chemical energy.

3 A car on the road has energy.

Because it has kinetic energy to allow it to move.

Q8 What happens when:

1 We turn on the gas oven.

The chemical energy changes into thermal energy.

2 We turn on the fan in the house.

The electrical energy changes into kinetic energy.

3 We squeeze a spring.

It stores potential energy, and when you leave it, potential energy changes into kinetic energy.

Concept

2.3

Energy and Motion

Evaluation Weeks 13 & 14

Q1

Put (✓) or (X):

- 1 The greater the angle of inclination, the greater the speed of the moving object is. (✓)
- 2 When the speed of a car increases, its kinetic energy decreases. (X)
- 3 When a car stops suddenly, the passengers rush backward. (X)
- 4 The risks resulting from a collision increase with the increase in mass. (✓)
- 5 Mass is one of the factors that affect speed. (✓)
- 6 The direction of movement of an object affects the force of its collision. (✓)
- 7 Energy before collision is different from energy after collision. (X)
- 8 The thermal energy produced by the pendulum is due to the force of gravity. (X)
- 9 The more speed doubles, the greater the kinetic energy. (✓)

Q2

Correct the underlined words:

- 1 The speed decreases by increasing the distance. (time)
- 2 The wrecking ball is a ball of light mass. (heavy)
- 3 The material moves when the collision between two bodies occurs. (energy)
- 4 When the speed of a body increases, the force of the collision decreases. (increases)

Q3

Complete the following sentences:

- 1 A wrecking ball is made of steel.
- 2 The speed increases by increasing the angle of inclination.
- 3 The unit of speed is kilometers/hour or meters/second.
- 4 Energy is transferred when collision occurs.
- 5 A wrecking ball is used in knocking down walls or parts of buildings.
- 6 When a tennis ball hits the racket, we hear a popping sound.
- 7 The kinetic energy of a body increases with increasing its speed.

- 8 The distance traveled by a body is measured in **meters or kilometers**.
- 9 Kinetic energy increases with the **mass** and **speed**.
- 10 Among the security and safety equipment in the car are the **seatbelt** and **airbag**.
- 11 Speed depends on two main factors, which are **distance** and **time**.
- 12 The stronger **force** increases the risk during collision.
- 13 When the mass of a body increases, the force of collision **increases**.
- 14 Fuel consumption increases in **fast** cars.
- 15 The total energy before the collision is **equal to** the total energy after the collision.
- 16 The risk of collision increases by increasing the **mass** and **speed**.
- 17 Newton's cradle loses energy in the form of **sound** and **thermal** energy.

Q4 Write the scientific term:

- 1 It's a physical quantity determined by distance and time. (Speed)
- 2 It's the distance traveled during a unit of time. (Speed)
- 3 It's a very heavy ball used to knock down buildings. (Wrecking ball)
- 4 It is a safety equipment that prevents the body from moving forward when a car crashes. (Seatbelt)
- 5 It occurs when two things bump or crash each other. (Collision)
- 6 It's a tool used to show energy transitions during collision. (Newton's cradle)
- 7 It's an audible energy produced during a collision. (Sound energy)
- 8 It's the energy stored in Newton's cradle when lifting a ball upwards. (Potential energy)

Q5 Answer the following questions:

- 1 Mention a means of safety in the car.
Seat belts - Airbags
- 2 Mention the equation by which the speed of a car can be determined.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

- 3 Mention the energy transitions in Newton's cradle.
Potential energy changes into kinetic energy.
Part of the kinetic energy changes into sound energy and thermal energy.
- 4 Mention the relationship between energy before collision and energy after collision.
The energy before collision is equal to the energy after collision.
- 5 Mention the relationship between the speed of the body and its kinetic energy.
When the speed increases, kinetic energy increases.
- 6 Mention the relationship between the speed of the body and the force of collision.
When the speed increases, the force of collision increases and causes more damage.
- 7 A car traveled a distance of 200 kilometers in two hours. Calculate its speed.
Speed = Distance \div Time = 200 \div 2 = 100 km/hr.
- 8 Calculate the speed of a car that travels a distance of 500 km every 5 hours.
Speed = Distance \div Time = 500 \div 5 = 100 km/hr.

Q6 Give reasons for:

- 1 A driver uses the seatbelt while driving.
To prevent his body from moving forward when the car stops suddenly.
- 2 A larger body in mass causes more damage in collision.
Because it has more mass, so it has more kinetic energy and more speed, making it cause more damage.
- 3 The airbag is very important in the car.
Because it slows the speed of the driver and it absorbs the energy of collision.
- 4 In a Newton's cradle, energy loss occurs in the form of thermal energy.
Because some of the kinetic energy changes into thermal energy due to the friction between the string and other parts of Newton's cradle.

- 5 The collision increases with increasing the mass.

As the mass increases, its kinetic energy increases and it causes more damage.

Q7

What happens if:

- 1 A ball collides with the tennis bat?

The bat transfers its kinetic energy to the ball, so the ball moves faster and changes its direction.

- 2 The angle of inclination of a moving object increases?

The speed and the kinetic energy of the object increase.

- 3 Two cars moving in the same direction collide?

The collision causes less damage.

- 4 Two cars moving in opposite directions collide?

The collision causes more damage.

- 5 Two bodies collide with each other?

The energy transfers between them and we can hear a pop sound.

- 6 The speed of a body increases? (According to its kinetic energy)

When the speed increases, kinetic energy increases.

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