

# Questions

## Unit (1)

### (1) Write the scientific term (What's meant by):

- 1- Elements have luster, good conductors of heat and electricity, malleable and ductile and they contain less than 4 electrons in outer most energy level. (.....)
- 2- The only non-metal that exists in a liquid state.(.....)
- 3- An atom gives an electron or more during the chemical reaction. (.....)
- 4- An atom gains one electron or more during the chemical reaction. (.....)
- 5- An atom that doesn't give or gain any electrons.(.....)
- 6- A bond resulting from the electric attraction between a positive ion and a negative ion. (.....)
- 7- A bond arises between two hydrogen atom, where each atom shares with one electron. (.....)
- 8- A bond resulting from the participation of each of the two atoms with three electrons. (.....)
- 9- The number of electrons gained, lost or even shared by an atom during a chemical reaction. (.....)
- 10- A set of atoms joined together, behave like one atom only, having a special valency and can't be existed soley. (.....)

- 11- Compound dissolved in water producing positive hydrogen ions.
- 12- Substances are dissociated in water producing negative hydroxide ions. (.....)
- 13- Compounds resulted from the combination between oxygen and an element even through it is metal or non-metal. (.....)
- 14- Compounds produced as a result of the chemical combination of a positive metal ion or positive atomic group with a negative atomic group or negative non-metal ion except oxygen.(.....)
- 15- A set of chemical formula and symbols expressing the reactants, the products and the reaction conditions. (.....)
- 16- Reactions which involve combination of two or more substances to form a new compound. (.....)
- 17- White fume formed on placing a glass rod wet with ammonia close to the mouth of a test tube containing conc. hydrochloric acid. (.....)
- 18- Poisonous gases that affect on both the eye and the nervous system. (.....)

### (2) Complete the following statements:

- 1- The positive ion carries a number of positive charges ..... the number of given electrons.
- 2- During the chemical reaction, sodium atom  ${}_{11}^{23}\text{Na}$  ..... one electron and changes into ..... ion.
- 3- The number of electrons in the outer shell of magnesium  ${}_{12}^{24}\text{Mg}$  atom is ..... while that of magnesium ion is .....

- 4- ..... is the only liquid metal element, while ..... is the only liquid non-metal element.
- 5- The negative ion carries a number of negative charges equal to the number of ..... electrons.
- 6- During the formation of sodium chloride,  ${}_{17}\text{Cl}$  atom ..... one electron and changes into to ..... ion.
- 7- The chemical bond in magnesium oxide molecule is ....., while bond in oxygen molecule is .....
- 8- The bond in hydrogen molecule is a ..... bond while the bond in nitrogen molecule is a ..... bond.
- 9- The valency of aluminium  ${}_{13}\text{Al}$  is ..... while that of calcium  ${}_{20}\text{Ca}$  is .....
- 10- The valency of sulphur atom may be ....., ..... or .....
- 11- The symbol of sulphate group is ..... and it is formed of ..... atoms of ..... different elements.
- 12- The chemical formula of sodium carbonate is ..... and it consists of ..... atoms of ..... different elements.
- 13- If the chemical formula of aluminium sulphate is  $\text{Al}_2(\text{SO}_4)_3$ , so the valency of aluminium atom is ..... while the valency of sulphate group is .....
- 14- The valency of sodium in sodium carbonate  $\text{Na}_2\text{CO}_3$  is ..... and its valency in sodium chloride  $\text{NaCl}$  is .....
- 15- On dissolving in water, acids give positive ..... ion and alkalies give negative ..... ion.

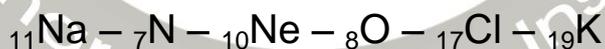
- 16- Mineral acids are formed when hydrogen is joined with one of ..... atomic groups except ..... group.
- 17- The symbol of all mineral acids begin with ..... atom, while the symbol of all bases end by ..... group.
- 18- ..... is from the salts that dissolve in water, while ..... is from the salts that insoluble in water.
- 19- In the reaction  $2\text{Mg} + \text{O}_2 \xrightarrow{\Delta} 2\text{MgO}$
- The ..... bond in oxygen molecule is broken to give .....
  - The magnesium atom combines with ..... atom to form ..... molecule.
- 20- If 48 gm of magnesium combine with 32 gms of oxygen, they produce ..... gm of .....
- 21- When fuel is burned in air, it gives .....
- 22- Sulphur oxides such as ..... and ..... are acidic gases which cause building .....
- 23- Burning of coal and cellulose fibers causes ..... pollution and .....

### **(3) Give reasons for:**

- When an atom gives an electron or more, it becomes a positive ion.
- When an atom gains an electron or more, it becomes a negative ion.
- Nobel gases don't participate in chemical reactions under ordinary state.
- The bond in a molecule of magnesium oxide is an ionic bond.
- Ionic bonds produce compounds only not elements, while covalent bonds produce both types an element and compound.

- 6- The bond in water molecule is a single covalent bond.
- 7- The bond in nitrogen  ${}_{7}\text{N}$  is a triple covalent bond.
- 8- Both sodium  ${}_{11}\text{Na}$  and chlorine  ${}_{17}\text{Cl}$  are monovalent although they have different atomic number.
- 9- An oxygen atom joins two atoms of sodium when composing one molecule of sodium oxide.
- 10- All acids turn the colour of litmus paper to be red and having a sour taste, while all bases turn the colour of litmus to be blue with a slippery taste.
- 11- We can obtain sodium chloride solution and not silver chloride solution.
- 12- A chemical equation should be balanced.
- 13- A white fumes are formed when ammonia gas reacts with conc. hydrochloric acid.
- 14-  $\text{CO}_2$  gas acts as greenhouse effect.
- 15- Carbon monoxide is a dangerous gas.

**(4) Write the electronic configuration for the following atoms:**



Then indicate:

- 1- The type of each element (metal – non metal – Nobel gas)
- 2- The type of ion for each of them (positive – negative – no ions)
- 3- The element that has no ability to form a bond is .....

### **(5) Two elements ${}_8A - {}_{12}B$**

- 1- Which one is a metal and which and which one is non-metal.
- 2- What is the kind of bond formed between the two atoms of (A)
- 3- Show by drawing the bond formed between A and B elements and mention the name of the formed compound if you know that A is Magnesium & B is Oxygen.

### **(6) Write the names of the following compounds and mention the number of atoms for each:**



### **(7) Write the chemical formula:**

- |                     |                      |
|---------------------|----------------------|
| 1- Sodium hydroxide | 2- Sodium sulphate   |
| 3- Copper nitrate   | 4- Magnesium oxide   |
| 5- Sulphuric acid   | 6- Copper sulphate   |
| 7- Aluminium oxide  | 8- Calcium nitrate   |
| 9- Calcium chloride | 10- Sodium carbonate |

### **(8) Write the chemical equation representing the following reactions, then indicate the type of each reaction:**

- 1- Burning of carbon in the presence of oxygen.
- 2- Reaction of ammonia gas and hydrochloric acid.
- 3- Reaction of carbon monoxide with oxygen.

### **(9) Calculate the masses of reactants and products:**



knowing that the mass of O = 16 , C = 12 , Mg = 24

# Unit (2)

### (1) Complete the following:

- 1- Universal forces in nature are divided into 3 divisions which are attraction force, ..... force and ..... force .
- 2- Object's center of gravity is the point at the center of the object at which the forces of ..... affects it.
- 3- ..... and ..... are the factors affecting the attraction force between the Earth and the object.
- 4- The object's weight increases as the height from Earth's centre .....
- 5- Electromagnet is made by the idea of changing ..... energy into ..... energy.
- 6- Electromagnet is used in making ..... and .....
- 7- Electric generator changes ..... energy into ..... energy.
- 8- Electric motor changes ..... energy into ..... energy.
- 9- Strong nuclear forces are used in producing ..... and in ..... purpose.
- 10- Egypt seeks to use ..... energy in producing electricity.
- 11- If a football player is tripped during running forward, he will be ..... and ..... on the ground.
- 12- ..... force prevents feet from slipping on roads during .....
- 13- ..... forces are resistant forces originated between a moving object & the medium touching it.
- 14- The contraction and ..... of muscle help the body organs to .....
- 15- If car (A) moves with higher speed than car (B), the driver in car (A) will see in the mirror that car (B) moves in ..... direction.

- 16- Transitional motion is not considered as periodic motion because it has ..... and ..... point and it doesn't ..... its motion.
- 17- Sound waves and ..... waves are examples of ..... waves.
- 18- Water waves is an example of ..... waves, while light waves is an example of ..... waves.
- 19- Thunder sound transfers in a form of ..... waves, where as lightning flash transfers in a form of ..... waves.
- 20- Light waves can spread out in all media and ..... with velocity of ..... m/s.
- 21- When the displacement value of an object is fixed, it is said that the object .....

### **(2) Choose the correct answer:**

- 1- A force is an effect .....
- a) always changes the phase of an object motion only
  - b) never changes the phase of an object motion
  - c) always changes both object's phase and direction.
  - d) may change the phase of an object motion.
- 2- An object's weight on the Earth's surface is related to ..... forces.
- a) electromagnetic
  - b) attraction
  - c) weak nuclear
  - d) strong nuclear
- 3- The bar used in electromagnet is made of .....
- a) isolated copper
  - b) steel iron
  - c) wrought iron
  - d) aluminium
- 4- Electromagnet is used in making the ..... set.
- a) calculator
  - b) electric bell
  - c) microscope
  - d) night vision

- 5- The electric motor changes the .....
- a) mechanical energy into electric energy.
  - b) electric energy into magnetic energy
  - c) electric energy into mechanical energy
  - d) magnetic energy into mechanical energy.
- 6- Some electric power stations work by ..... energy.
- a) attraction      b) magnetic      c) nuclear      d) electromagnetic
- 7- When the horse is tripped, the horse rider is suddenly rushed forward, this is related the force of .....
- a) inertia      b) centrifugal      c) attraction      d) horse pushing
- 8- All the following forces are due to inertia except .....
- a) once the car starts moving forward, the passengers are rushed back
  - b) passengers are rushed forward if the moving car stopping suddenly.
  - c) if a football player is tripped during running forward, he will be rushed forward
  - d) the attraction of bodies to the Earth
- 9- Electric fan still works for few seconds after cutting the electric current due to .....
- a) friction      b) gravity      c) inertia      d) electromagnet
- 10- The car brake performance is an application of .....
- a) attraction forces      b) friction forces
  - c) electromagnetic forces      d) forces of inertia
- 11- Car tires are covered with a very coarse substance to .....
- a) reduce the friction with the road
  - b) reduce the air resistance
  - c) increase the attraction of wheels
  - d) increase the friction with the road

- 12- ..... is from the forces inside living systems.
- a) the contraction and relaxation of muscles
  - b) forces of inertia
  - c) electrostatic forces
  - d) friction forces
- 13- When two cars move in the same direction with a velocity 80 km/h, the driver of the first car imagines that the second car moves with ..... km/h.
- a) zero
  - b) 80
  - c) 160
  - d) no correct answer
- 14- All of the following are periodic motion except the ..... motion
- a) fan
  - b) pendulum
  - c) train
  - d) sunflower
- 15- Mechanical waves are characterized by .....
- a) their speed is greater than electromagnetic waves
  - b) their speed is 300 million m/s
  - c) they need a medium to propagate through.
- 16- We see lightning before hearing thunder because .....
- a) lightning occurs before thunder
  - b) sound needs a medium to travel through.
  - c) the velocity of light is 340 m/s
  - d) the velocity of light is much greater than that of sound.
- 17- ..... are used in night vision apparatus.
- a) Infrared rays
  - b) Ultraviolet rays
  - c) Gamma rays
  - d) rays
- 18- Visible light is used in all the following applications except .....
- a) night vision apparatus
  - b) television cameras
  - c) photographic cameras
  - d) data shows

### **(3) Write the scientific term:**

- 1- The ability of the Earth to attract an object to its center.
- 2- An instrument used to change electric energy into magnetic energy.
- 3- The force that accompanies the massive amount of energy and it is stored in the nucleus.
- 4- Property of an object has to resist the change of its phase unless an external force acted on it.
- 5- Resistant forces originate between the object in motion and the medium.
- 6- Forces that helps living organisms to do its biological operations.
- 7- It is the motion of an object in which its position changed relative to a fixed point from initial to final position.
- 8- The motion which is regularly repeated in equal periods of time.
- 9- Waves which are accompanied by electromagnetic forces.
- 10- The distance covered by an object in a unit time.

### **(4) Put (√) or (×) of the following:**

- 1- As the height from the Earth's surface increases, the value of Earth's gravity acceleration decreases. ( )
- 2- The electric current has a magnetic effect. ( )
- 3- Dynamo changes electric energy into mechanical energy. ( )
- 4- Strong nuclear forces are used in medicine. ( )
- 5- Friction is a property of an object that has to resist the change of its phase. ( )
- 6- Friction prevents feet from slipping on roads during walking. ( )
- 7- Heart muscle contraction and relaxation is one of the forces inside living organisms. ( )
- 8- Liquid transport through pores and the wall of cells from the higher concentration to the lower one. ( )

- 9- When you are in a moving car and another car moves beside you in the same direction with the same speed, you will imagine that the two cars don't move. ( )
- 10- Motion is divided into two types which are circular motion and translational motion. ( )
- 11- We hear thunder before seeing lightning. ( )
- 12- Ultraviolet rays are used in examining and curing sets for the human body. ( )
- 13- Infrared rays are used in sterilizing the sets of surgical operation rooms. ( )
- 14- X-rays are used in examining mineral raws in industry. ( )

### **(5) Give reasons:**

- 1- Object's weight changes from one place to another on the Earth's surface.
- 2- Gravity acceleration changes of Earth's surface from one place to another.
- 3- The importance of dynamo in the case of cutting off the electric current.
- 4- The car passengers are rushed forward when the moving car stops suddenly.
- 5- In a car at rest, passengers are rushed backward when the car moves suddenly.
- 6- Policemen advise drivers using safety belts in cars.
- 7- Cars that travel on snow have to carry chains that fit around the tires.
- 8- Cars tires are covered with a very coarse substance.
- 9- Lubricants and oiling mechanical machines.
- 10- Importance of the forces inside living systems.
- 11- Circular motion is a periodic motion.
- 12- We receive the sunlight, while we can't hear the sound of solar explosions.
- 13- Astronauts can't hear each other voices directly in space.
- 14- X-rays used in photographing bones.

### **(6) What's meant by:**

- |                    |                               |
|--------------------|-------------------------------|
| 1- Object's weight | 2- An object's weight is 60 N |
| 3- Inertia         | 4- friction                   |
| 5- Relative motion | 6- transitional motion        |
| 7- Periodic motion | 8- speed                      |

### **(7) Problems:**

- 1) If the earth's gravity acceleration in a place is  $9.8 \text{ m/s}^2$ , find the weight of the following:
- a) 0.3 kg mass ball                      b) 50 kg mass boy
- 2) The weight of object on Mars is 32 Newton and on Earth is 80 Newton, what's the gravity acceleration on Mars if the gravity acceleration on earth is  $10 \text{ m/s}^2$ .

### **(8) Give an example indicating each of the following:**

- |                     |                        |
|---------------------|------------------------|
| 1- Relative motion  | 2- Transitional motion |
| 3- Vibrating motion | 4- Circular motion     |
| 5- wave motion      | 6- Mechanical waves    |

### **(9) Mention the name of rays (or waves) used in each of the following:**

- 1- Medical examining
- 2- Making remote sets to control and start electric sets
- 3- Photographing

### **(10) Mention one application for each of the following:**

- |                |                  |                     |
|----------------|------------------|---------------------|
| 1- sound waves | 2- infrared rays | 3- ultraviolet rays |
| 4- X-rays      | 5- Gamma rays    | 6- visible light    |

### **(11) Compare between:**

Mechanical waves and electromagnetic waves.

### Unit (3)

#### (1) Complete the following:

- 1- The types of telescopes are ..... and .....
- 2- The planets revolve around the sun in ..... orbits which lie in a plane ..... on the sun's axis of rotation.
- 3- The nearest planet to the sun is ..... and the farthest one from the sun is .....
- 4- Mercury, ....., ..... and Mars are the inner planets.
- 5- ..... planet has 27 moons revolving around it, while ..... planet has 12 moons revolving around it.
- 6- The comet consists of two parts which are ..... and .....
- 7- The planet Earth occupies the ..... position according to the distance from the sun where it's far from the sun about ..... km
- 8- Green plants use ..... gas in photosynthesis process.
- 9- Ground water exists in the ..... of the rocks that forming the Earth's mass.
- 10- Granite rock consists of ....., ..... and ..... minerals, while basalt rock consists of ....., ..... and ..... minerals.
- 11- The main component of Sandstone is ..... mineral.
- 12- Marble is resulted from transformation of .....

### **(2) Choose the correct answer:**

- 1- The distance between stars are measured in ..... unit.  
a) meter                      b) kilometer                      c) Newton                      d) light year
- 2- The distance covered by light in two years equals ..... km.  
a)  $9.467 \times 10^{12}$                       b)  $9.467 \times 10^6$   
c)  $18.934 \times 10^{12}$                       d)  $18.934 \times 10^6$
- 3- The telescope is used to study the .....  
a) minerals                      b) earthquakes                      c) volcanoes                      d) celestial bodies
- 4- The big-sized, less dense planet which consists of gaseous elements is the .....  
a) Earth                      b) Mercury                      c) Jupiter                      d) Venus
- 5- The densities of inner planets ranging between .....  $\text{gm/cm}^3$ .  
a) 3.3 to 1.3                      b) 3.3 to 5.5                      c) 0.7 to 1.3                      d) 0.7 to 5.5
- 6- Which of the following planets has the largest gravity on its surface? ...  
a) Mars                      b) Mercury                      c) Venus                      d) Earth
- 7- The mass of the biggest meteorite found up till now reaches ..... tons.  
a) 100                      b) 80                      c) 50                      d) 10
- 8- ..... comet is the most famous one.  
a) Galileo's                      b) Halley's                      c) Newton's                      d) Noble's
- 9- Regarding the volume, the Earth occupies the ..... order in the solar system.  
a) third                      b) fourth                      c) fifth                      d) eight
- 10- Ozone layer protects life on the Earth by absorbing ..... rays.  
a) infrared                      b) visible                      c) invisible                      d) ultraviolet
- 11- ..... rock is characterized by that it is heavy, rough, solid, cohesive and it isn't easily broken.  
a) Basalt                      b) Marble                      c) Limestone                      d) Granite

### **(3) Write the scientific term:**

- 1- The bigger unit which forms this universe. (.....)
- 2- The farthest four planets from the sun. (.....)
- 3- An inner planet has no atmosphere. (.....)
- 4- The satellites of the planets. (.....)
- 5- The most famous comet which completes its revolution around the sun each 76 years. (.....)
- 6- The biggest inner planet. (.....)
- 7- The most abundant gas in air. (.....)
- 8- A layer of molten metal's with a thickness 2100 km. (.....)
- 9- It is a very hot thick liquid underneath the Earth's crust. (.....)
- 10- Masses of molten materials that spread on sides of a volcano. (.....)

### **(4) Give reasons for:**

- 1- Astronomers do not measure the distance between stars in kilometers.
- 2- Mercury, Venus, Earth and Mars are called the inner planets.
- 3- The density of outer planets is low.
- 4- The presence of white colour surrounds the planet Earth.
- 5- Steadfastness of the hydrosphere on the Earth's surface.
- 6- The Earth's inner core is rich in iron and nickel.
- 7- Volcanic rocks contain small circular holes.
- 8- The components of basalt rock cannot be seen by the naked eye.

### **(5) Compare between:**

- 1- Outer planets and inner planets
- 2- Sandstone and limestone

# Model Answers

## Unit (1)

### (1) Write the scientific term (What's meant by):

- |                                  |                  |                         |
|----------------------------------|------------------|-------------------------|
| 1- Metals                        | 2- Bromine       | 3- positive ion         |
| 4- negative ion                  | 5- Nobel gas     | 6- Ionic bond           |
| 7- single covalent bond          |                  | 8- triple covalent bond |
| 9- the valency                   | 10- atomic group | 11- acids               |
| 12- bases                        | 13- oxides       | 14- salts               |
| 15- chemical equation            |                  |                         |
| 16- direct combination reactions |                  | 17- ammonium chloride   |
| 18- nitrogen oxides              |                  |                         |

### (2) Complete:

- |   |  |
|---|--|
| 1- equal to                             | 2- loses – positive                        |
| 3- two – eight                          | 4- mercury – bromine                       |
| 5- gained                               | 6- gains – negative                        |
| 7- ionic – double covalent              |  |
| 8- single covalent – triple covalent    | 9- trivalent - divalent                    |
| 10- divalent – tetravalent – hexavalent |  |
| 11- $(\text{SO}_4)^{-2}$ – five – two   | 12- $\text{Na}_2\text{CO}_3$ – six - three |
| 13- trivalent – divalent                | 14- monovalent – monovalent                |
| 15- hydrogen – hydroxide                | 16- negative – OH                          |
| 17- H , OH                              |  |
| 18- sodium chloride – silver chloride   |  |

- 19- a) double covalent – two oxygen atoms  
b) oxygen – magnesium oxide
- 20- 80 – magnesium oxide
- 21- Carbon oxides, Sulphur oxides, Nitrogen oxides
- 22- sulphur dioxide – sulphur trioxide – corrosion
- 23- air – lung cancer

### **(3) Give reasons:**

- 1- because the number of electrons becomes less than the number of protons.
- 2- Because the number of electrons becomes more than the number of protons.
- 3- Due to the completeness of their outermost energy level with electrons so they are stable.
- 4- Because magnesium loses two electrons and changes into positive ion, while oxygen gains the two electrons and changes into negative ion, then electric attraction occurs between positive and negative ion.
- 5- Because ionic bond arises between two different atoms, while covalent bond arises between two similar or different non-metal atoms.
- 6- Because oxygen atom shares two hydrogen atoms by two electrons, one for each hydrogen atom.
- 7- Because each nitrogen atom shares with three electrons to form triple covalent bond.
- 8- Because during chemical reactions, sodium atom loses one electron, while chlorine atom gains or shares with one electron.
- 9- Because oxygen is divalent, while sodium is monovalent.



**(6) Write the names of the following compounds and mention the number of atoms for each:**

- 1- Carbon dioxide (3 atoms)
- 2- Sodium phosphate (8 atoms)
- 3- Aluminum sulphate (17 atoms)
- 4- Calcium hydroxide (5 atoms)
- 5- Sulphuric acid (7 atoms)

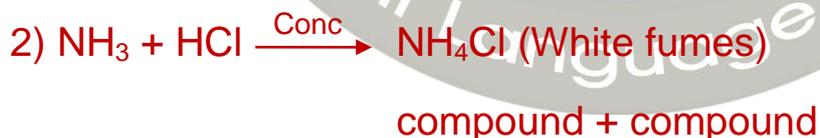
**(7) Write the chemical formula:**

- |                                   |                                     |                                      |                                      |
|-----------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|
| 1) NaOH                           | 2) Na <sub>2</sub> SO <sub>4</sub>  | 3) Cu(NO <sub>3</sub> ) <sub>2</sub> | 4) MgO                               |
| 5) H <sub>2</sub> SO <sub>4</sub> | 6) CuSO <sub>4</sub>                | 7) Al <sub>2</sub> O <sub>3</sub>    | 8) Ca(NO <sub>3</sub> ) <sub>2</sub> |
| 9) CaCl <sub>2</sub>              | 10) Na <sub>2</sub> CO <sub>3</sub> |                                      |                                      |

**(8) Write the chemical equation representing the following reactions, then indicate the type of each reaction:**



Element with Element  
(non metal + non metal)



Element and Compound

### **(9) Calculate the masses of reactants and products:**

1) Mass of reactants =  $(2 \times 24) + (2 \times 16) = 80$  gm

Mass of products =  $2(24 + 16) = 80$  gm

2) Mass of reactants =  $12 + (2 \times 16) = 44$  gm

Mass of products =  $12 + (2 \times 16) = 44$  gm

## **Unit (2)**

### **(1) Complete the following:**

1- electromagnetic – nuclear forces

2- gravity

3- Object's mass – earth's gravity acceleration

4- decreases

5- electric – magnetic

6- electric winches – electric bells

7- mechanical – electric

8- electric – mechanical

9- electric energy – military

10- nuclear

11- rushed forward – fall down

12- friction – walking

13- friction

14- relaxation – move

15- opposite

16- initial – end – repeat

17- water – mechanical

18- mechanical – electromagnetic

19- mechanical – electromagnetic

20- space – 300 million

21- at rest

### **(2) Choose:**

1- d

2- b

3- c

4- b

5- c

6- c

7- a

8- d

9- c

10- b

11- d

12- a

13- a

14- c

15- c

16- d

17- a

18- a

### (3) Scientific term:

- |                          |                                 |
|--------------------------|---------------------------------|
| 1- Object's weight       | 2- electromagnet                |
| 3- nuclear force         | 4- inertia                      |
| 5- friction forces       | 6- forces inside living systems |
| 7- transitional motion   | 8- periodic motion              |
| 9- electromagnetic waves | 10- speed                       |

### (4) Put (√) or (×):

- |         |         |         |         |
|---------|---------|---------|---------|
| 1- (√)  | 2- (√)  | 3- (×)  | 4- (×)  |
| 5- (×)  | 6- (√)  | 7- (√)  | 8- (×)  |
| 9- (√)  | 10- (×) | 11- (×) | 12- (×) |
| 13- (×) | 14- (√) |         |         |

### (5) Give reasons:

- 1- Because Earth's gravity acceleration changes from one place to another.
- 2- Because the distance between Earth's surface and the earth's center changes from one place to another as the Earth has non-spherical shape.
- 3- Because it is used in generating electric energy.
- 4- Due to inertia force, as they try to maintain their state of motion.
- 5- Due to inertia force, as they try to keep their static state.
- 6- Because safety belts work on stopping the forces of inertia to prevent car passengers from being injured when a sudden change in motion occurs.
- 7- To increase friction to control the motion.
- 8- To increase friction between tyres and the road to help car in starting and stopping motion.
- 9- To decrease friction between moving parts of machine.
- 10- To enable living organisms to do their biological operations and keep their survival and vitality.
- 11- Because it is a motion which is regularly repeated in equal periods of time.

- 12- Because the sunlight is electromagnetic waves which can travel through space, while the sound of solar explosions is mechanical waves which can't travel through space.
- 13- Because there is no medium for sound waves to travel through.
- 14- Because they detect the bone fractures

### (6) What's meant by:

- 1- Object's weight: the ability of the Earth to attract that object to its center.
- 2- This means that the force of the Earth to attract this object toward its centre is 60 Newton.
- 3- A property of an object that has to resist the change of its phase from rest to motion in straight line with regular speed unless an external force acted on it.
- 4- Resistant forces originate between the object in motion and medium touching it in the opposite direction.
- 5- Change in an object's position or direction as the time passes relative to another object or fixed point.
- 6- The motion in which the object's position is changed relative to a fixed point from time to time between initial and final positions.
- 7- Motion which is regularly repeated in equal periods of time.
- 8- The displacement covered by an object in a unit time.

### (7) Problems:

1) The weight of the object = object's mass × earth's gravity acceleration

a) The weight of the ball =  $0.3 \times 9.8 = 2.94$  Newton

b) The weight of the boy =  $50 \times 9.8 = 490$  Newton

2) Object's mass =  $\frac{\text{object's weight on Earth}}{\text{earth's gravity}} = \frac{80}{10} = 8$  kg

Gravity acceleration on Mars =  $\frac{\text{weight on Mars}}{\text{mass}}$

Gravity acceleration on Mars =  $\frac{32}{8} = 4$  m/sec<sup>2</sup>

**(8) Give an example:**

- 1- A car moves relative to a tree.
- 2- motion of bicycle or car
- 3- vibration of pendulum
- 4- motion of an arm of fan
- 5- Water waves
- 6- sound waves

**(9) Name of rays**

- 1- Gamma rays or X-rays
- 2- infrared rays
- 3- visible light or infrared rays

**(10) Mention one application:**

- 1- Examining and curing set for human body by ultrasonic waves.
- 2- cooking food
- 3- Sterilizing the sets of surgical operations.
- 4- photographing bones
- 5- In medical purposes
- 6- In photographic cameras

**(11)**

Mechanical waves	Electromagnetic waves
1- They are produced by the vibration of the medium particles 2- They need a medium to travel or transfer through. 3- Their speed is relatively low speed of sound is 340 m/s <b><u>Examples:</u></b> sounds waves - water waves	1- They are accompanied by electromagnetic forces. 2- They spread in all media and space 3- Their speed is very high speed of light is 300 million m/s <b><u>Examples:</u></b> Light waves – X-rays

### Unit (3)

#### (1) Complete the following:

- 1- reflecting – refracting
- 2- oval or semi-circular or elliptical – perpendicular
- 3- Mercury - Neptune
- 4- Venus – Earth
- 5- Uranus – Neptune
- 6- head – tail
- 7- Third – 150 million
- 8- carbon dioxide
- 9- pores and cracks
- 10- (quartz – feldspar – mica) , (olivine – pyroxene – feldspar)
- 11- quartz
- 12- limestone

#### (2) Choose:

- |      |      |      |       |       |      |
|------|------|------|-------|-------|------|
| 1- d | 2- c | 3- d | 4- c  | 5- b  | 6- d |
| 7- b | 8- b | 9- b | 10- d | 11- d |      |

#### (3) Scientific term:

- |                |                   |              |
|----------------|-------------------|--------------|
| 1- Galaxy      | 2- outer planets  | 3- Mercury   |
| 4- moons       | 5- Halley's comet | 6- the Earth |
| 7- Nitrogen    | 8- Outer core     | 9- Magma     |
| 10- Lava flows |                   |              |

#### (4) Give reasons:

- 1- Because these distances very large to be measured by kilometers so it is measured by the light year.
- 2- Because they are nearest four planet to the sun.
- 3- Because they consist mainly of gaseous elements.
- 4- Due to the presence of the atmosphere that appears as a white colour around the earth.
- 5- Due to the gravitational force of the Earth.

- 6- Because they are from heavy elements that descend towards the center of the earth due to its rotation around its centre.
- 7- Due to the extruding of gases from volcanic flows during their cooling and formation of rock.
- 8- Because it is a volcanic rock which has very small crystals.

### (5) Compare:

1)

Points of comparison	The inner planets	The outer planets
<b>1. Definition</b>	They are the nearest four planets to the Sun.	They are the farthest four planets from the Sun.
<b>2. Their arrangement from the Sun:</b>	Mercury - Venus - Earth and Mars	Jupiter - Saturn - Uranus and Neptune.
<b>3. Size:</b>	Small in size.	Big in size.
<b>4. Structure:</b>	Rocky components	Solidified gases
<b>5. Density:</b>	High	Low
<b>6. No. of moons rotating around them:</b>	A few number of moons (except Mercury and Venus have no moons).	Large number of moons.

2)

	Sandstone	Limestone
<b>Colour</b>	yellow	White
<b>Texture</b>	Coarse - Sand grains	Smooth touch
<b>Mineral</b>	quartz	Calcite (CaCO <sub>3</sub> precipitates in Lime Solution)
<b>Reaction with dilute hydrochloric acid</b>	No reaction take place	Effervescence due to evolving of CO <sub>2</sub> gas.