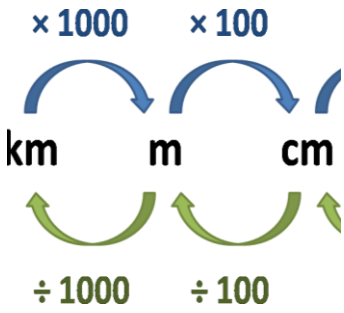
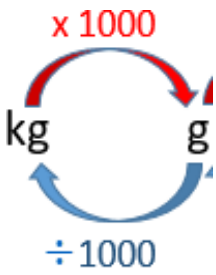
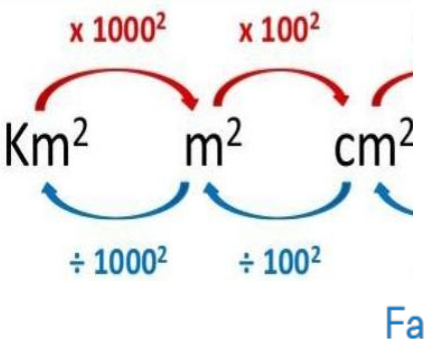






$K = °C + 273$

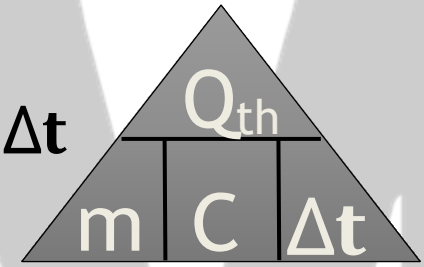
$°F = °C \times \frac{9}{5} + 32$

Fahrenheit Celsius

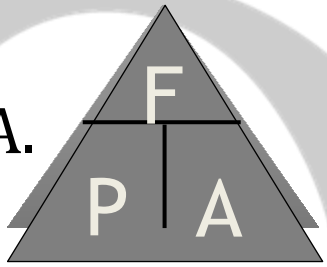
. 101300 N/M^2 =101300 Pascal = 1013 Milli Bar = 1 atm = 760 mmhg

. 1 Bar=1000millibar = 10^5 Pascal = 10^5 N/m^2

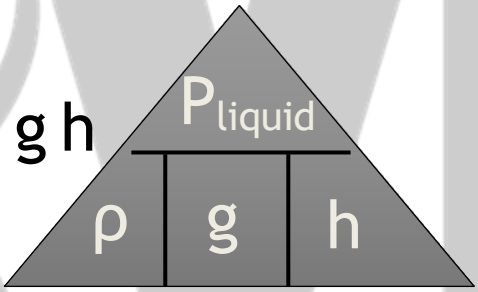
$Q_{th} = m\ c\ \Delta t$



$F = P \times A.$



$P_{liquid} = \rho\ g\ h$

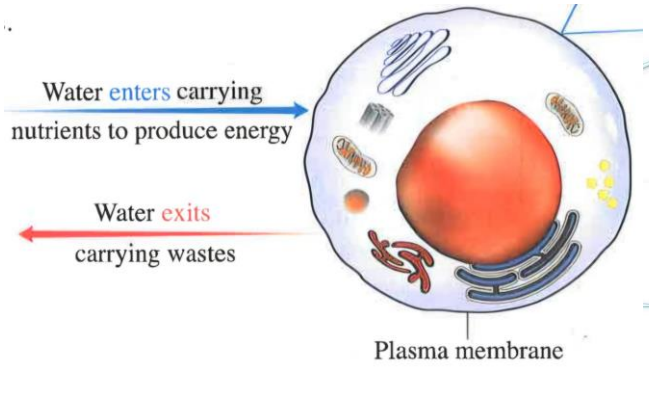


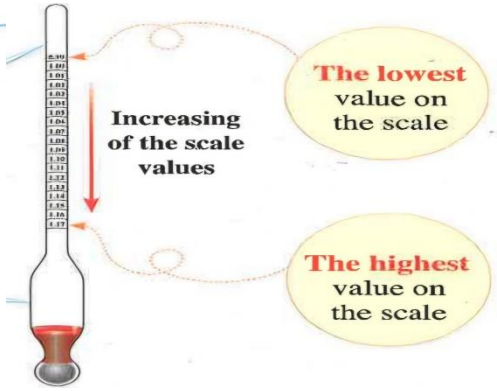
$P_{total} = Pa + P_{liquid} = Pa + \rho\ g\ h$

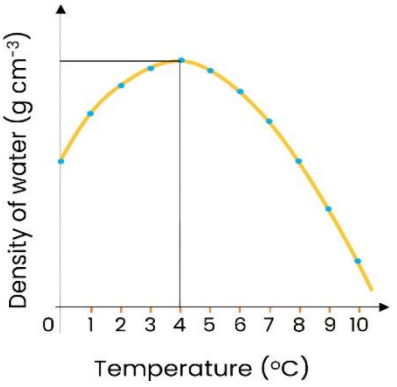
1 Bar= 1 a = 10^5 Pascal = 10^5 N/m²

Devices

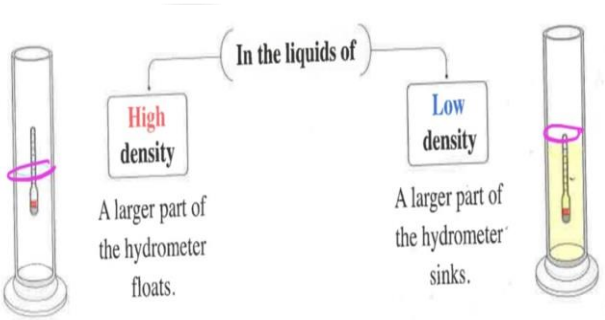
1. Barometer: used to measure atmospheric pressure
2. pH meter: used to measure of how acidic/basic water is.
3. Joule calorimeter: used to determine the specific heat of water.
4. Moisture meter: to detect moisture content in soil.
5. hygrometer: to measure the humidity, or amount of water vapor in the air.
6. Gas Chromatography: It is used to analyze volatile organic compounds such as benzene, and formaldehyde
7. UV spectroscopy :Used to measure oxides of nitrogen and ozone in the air.



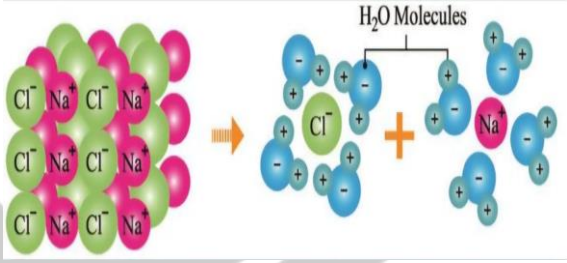


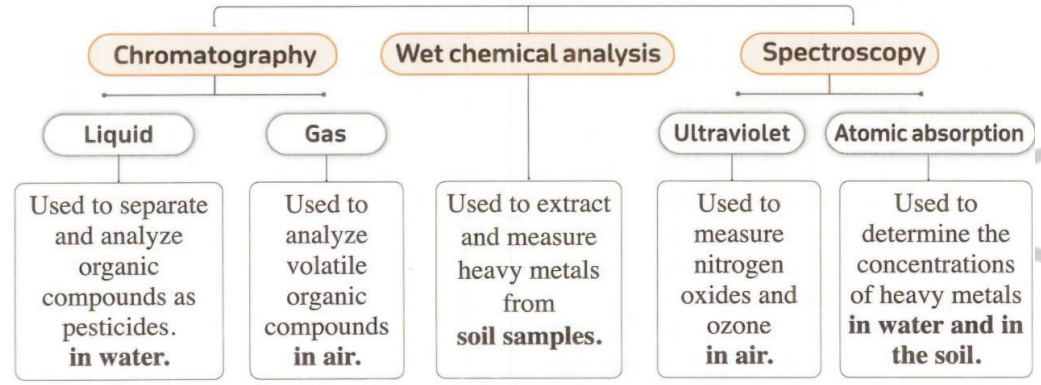


P.O.C	Water (H_2O)	Hydrogen sulphide (H_2S)
1 Type of bonds between the atoms in the molecule	Covalent	Covalent
2 Hydrogen bonds among molecules and each other	Present	Absent
3 Boiling point (at normal atmospheric pressure)	100°C	– 61°C

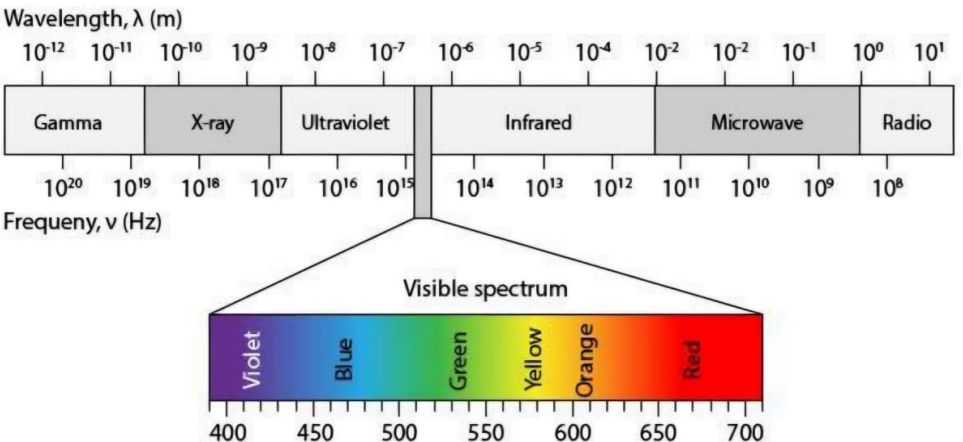


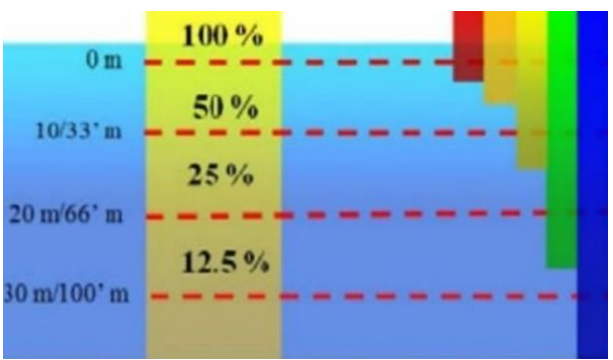
Colligative properties	Solution		Its pure solvent
Vapor pressure	Vapor pressure of solution	<	Vapor pressure of pure solvent
Boiling point	Boiling point of solution	>	Boiling point of pure solvent
Freezing point	Freezing point of solution	<	Freezing point of pure solvent
Osmotic pressure	The osmotic pressure of the solution	>	The osmotic pressure of pure solvent





Water type	The pH value	Acidity or alkalinity
1 Seawater	7.5 : 8.4	Alkaline
2 Fresh water (Rivers and lakes)	6.5 : 8.5	Acidic, neutral or alkaline
3 Distilled water	7	Neutral
4 Groundwater	It depends on the rock structure of the ground	Neutral – Alkaline
5 Clouds water	4.5 : 5	Weak acidic





Increasing the percentage of CO_2 gas in water

Increasing the percentage of CO_2 gas in the atmosphere

leads to

Increasing its solubility in water

leads to

Increasing the concentration of carbonic acid

Decreasing the pH value of water

Acidification occurs

As it can be harmful to many species of aquatic organisms, especially those in sensitive life stages, such as egg and larval stages.

leads to

Decreasing the percentage of dissolved O_2 gas in water

Weak respiration of aquatic organisms

converts

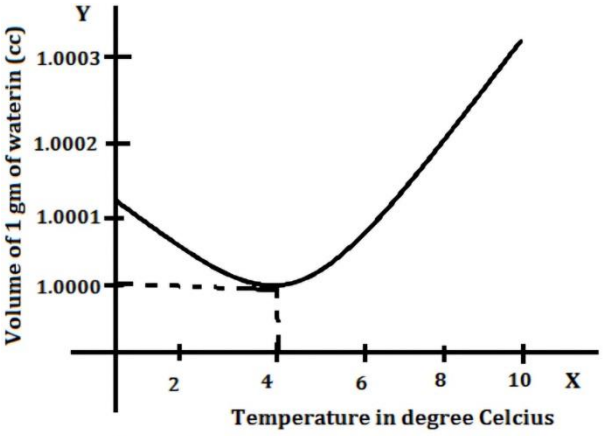
Calcium carbonate (sparingly soluble in water)

into

Calcium bicarbonate (soluble in water)

Reduced calcification

As it obstructs the ability of some organisms such as corals, mollusks and some types of plankton to build or maintain their skeletons.



Variation in volume of water in range of temperature 0 degree to 10 degree

Chemical pollutants

Pesticides

Chemical substances used to control insects and the diseases they cause.
Example: Dieldrin and chlordane.

Heavy metals

They are metals which accumulate in the environment and inside the cells of living organisms.
Example: Lead, mercury and cadmium.

Volatile organic compounds

They are organic compounds that can vaporize into the air and pollute it.
Example: Benzene, formaldehyde and chloroform.

The effect of pollutants on the environment

Water pollution

Example:
Pesticides leaking from farms into waterways
↓ may cause
killing fish and aquatic animals.

Air pollution

Example:
The resulted emissions from factories and cars, such as nitrogen oxides and fine particulate matter
↓ may contribute to
the smog formation that affects the health of plants and animals.

Soil pollution

Example:
The accumulation of heavy metals, such as lead and mercury in the soil as a result of industrial waste or the use of fossil fuels
↓ may affect
the plant growth and make the soil unfit (invalid) for agriculture.

The effect of pollutants on the human health

Respiratory diseases

Example:
Inhaling air contaminated with ozone or particulate matter
↓ can lead to
respiratory diseases, such as:
- Asthma. - Pneumonia. - Bronchitis.

Nervous system disorders

Example:
Exposure to heavy metals, such as mercury and lead
↓ can affect
the central nervous system, leading to neurological disorders.

Chronic diseases

Example:
Exposure to toxic chemical substances such as benzene and formaldehyde
↓ can increase
the risk of getting cancer.

The concentration of **oxygen gas in air** is about **500** times **higher** than The concentration of **carbon dioxide gas** in air

The solubility of **oxygen gas in water** is about **50** times **less** than The solubility of **carbon dioxide gas** in water

The solubility of **both gases in salty water of oceans** is about **(20% – 30%) less** than The solubility of **both gases in fresh water**

Animals

- **Fish: (General term used throughout the document)**
- **Possess adaptations to survive in various aquatic environments (freshwater, saltwater, deep sea).**
- **Examples and specific adaptations:**
- **Deep-sea fish: Adapted to low oxygen and high pressure; some have large gills with fine capillaries for efficient oxygen extraction.**
- **Electric Eel: Deep-water fish with large gills and ability to slow metabolism in low-oxygen environments.**
- **Icefish: Deep-sea fish in Southern Oceans; compressed body, lacks hemoglobin, absorbs oxygen directly from water.**
- **Tilapia: Has a gas-filled swim bladder for buoyancy control.**
- **Salmon: Migrates between freshwater and saltwater; adapts to changes in salinity and oxygen.**
- **Sharks: Maintain water balance by controlling urea levels in their blood.**
- **Rays: Compact bodies, may lack swim bladders; may have liquid-filled bladders and rely on oil-rich livers for buoyancy.**
- **Tuna and Barracuda: Live in warm tropical waters.**
- **Cod: Prefer colder waters.**
- **Predatory fish: Help maintain ecosystem balance by controlling prey populations.**

Plants

- **Plants: Found in various terrestrial and aquatic environments.**
- **Trees: Important for carbon sequestration, climate regulation, and habitat.**
- **Wheat: Agricultural crop negatively affected by high temperatures.**
- **Tomato: Needs specific temperatures for optimal growth.**
- **Tropical plants: Require high humidity.**
- **Desert plants: Adapted to low humidity.**
- **Legumes: Host nitrogen-fixing bacteria in roots, improving soil fertility.**

Conservation Success Stories

- **Bald Eagle: The bald eagle in the United States was endangered due to the use of the pesticide DDT, which affected the birds' reproduction. Because of laws banning DDT and conservation programs, the eagle population increased dramatically, and it was removed from the endangered species list.**
- **Southern White Rhinoceros: Because of conservation and captive breeding efforts, the southern white rhino population has increased from near extinction, showing the effectiveness of these strategies.**

1. Water is composed of two elements, hydrogen and oxygen, in a ratio of **2:1** by volume, respectively
2. oxygen represents **88.89%** of the **mass** of a water molecule and hydrogen represents **11.11%**
3. Two hydrogen atoms are linked to the oxygen atom by two **covalent bonds**, between which an angle measuring about **104.50°.**
4. boiling point of **pure water** which is **100°C** at **normal atmospheric pressure**
5. **hydrogen sulphide**, which boils at**- 61°C**.
6. **pH value** of the solution It is a scale that ranges **from 0 to 14**
7. less than 7 is acidic, greater than 7 is basic, equal to 7 is neutral.
8. Seawater: The pH value of seawater generally ranges from **7.5 to 8.4.**
9. **Fresh water** (rivers and lakes): the pH value varies and normally ranges **from 6.5 to 8.5.**
10. **Distilled water**: It has a pH value of **about 7**, because it is free of most of the impurities and ions.
11. **Groundwater:** is either **neutral or basic**.
12. **Clouds**: are generally slightly acidic, with values ranging from **4.5 to 5, due to carbon dioxide**
13. In case of **pure water**, the mass of **1 cm^3** of it at a temperature of **4°C** equals **1 g.**
14. The **density** of water at **4°C** equals **1 g/cm3,** which is equivalent to **1000 kg / m3** in the **international unit (SI).**
15. Normal **salinity** of ocean water is **35 grams per liter of water.**
16. The **concentration** of **oxygen gas** in the **air** is **about 500 times higher than** that of **carbon dioxide**.
17. **oxygen** gas is about **50 times** less soluble in water **than** that of **carbon dioxide.**

18. The **solubility** of the two gases " O_2 , CO_2" in **salty ocean** water is about **20-30% lower** than their solubility in fresh water.
19. At a depth of **10 meters**, more than **50%** of **visible light** energy is **absorbed**.
20. In clear **tropical waters**, only about 1% of visible light mostly in the blue spectrum reaches a depth of 100 meters.
21. **Nitrogen (N2)**: represents about **78%** of the volume of the atmosphere.
22. **Oxygen (O2)**: represents about **21%** of the volume of the atmosphere.
23. **Argon (Ar)**: an inert gas that makes up about **0.93%** of the volume of the atmosphere.
24. **Carbon dioxide (CO2)**: Makes up about **0.04%** of the volume of the atmosphere and is essential for plant photosynthesis.
25. **Ozone gas (O3)**: The ozone layer is found at an altitude of approximately **10 km - 55 km** from The Earth's surface.
26. **Troposphere**: The layer **closest to The Earth's** surface, with a **thickness** of about **18 km at the equator** and **8 km at the two poles**.
27. **The air temperature** decreases **by one degree** Celsius for every **176 m.**
28. **Stratosphere**: its height up to 50 km above sea level,
29. **The temperature** does not change through the stratosphere layer until an **altitude of 20 km**.
30. **Mesosphere**: A layer about **30 km** thick, with the lowest temperature (**-90 °C**).
31. **Ionosphere**: Extending approximately to **640 km** above sea level.
32. The escape velocity from Earth's gravity is about **11.2 km/s.**

Last Night

1- What role does ozone play in the chemical treatment of water?

a) Desalination of water
b) Has a high ability to absorb organic matter and chemical pollutants.
c) Oxidizes some organic and inorganic to harmless substances.
d) Purification of water from gases

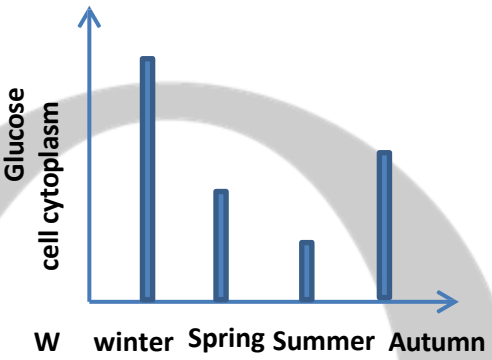
2- Which of the following reactions leads to decay ozone layer?

a) $NO + O_3 \rightarrow NO_2 + O$ c) $NO_2 + O_3 \rightarrow NO + O_2$
b) $NO_2 + O \rightarrow NO + O_2$ d) $NO + O_2 \rightarrow NO_2$

3- The opposite figure shows the amount of Glucose in the cytoplasm of the cells of an Organism.

- study it carefully and then conclude:

Which regions of the globe can this organism Live in?



a) Aquatic temperate zone
b) The frozen polar region
c) Tropical forest zone
d) Desert zone

4- Freezing of and Thawing of water is a reason for ……weathering

a) Mechanical b) Biological c) chemical d) physical

5- One of your friends who lives in America wants you to tell the rest of your classmates in other countries that it is now 86 °F in America.

-The temperature you will send in a way that all your friends in the scientific field will understand =....

a) 86 °F b) 30 °C c) 42 °C d) 303 K

6- Liquid substances often have a higher molecular weight than gaseous substances , despite this, water is a liquid at normal temperature while hydrogen sulfide is a gas (Molecular weight of H_2O= 18, molecular weight H_2S= 34)

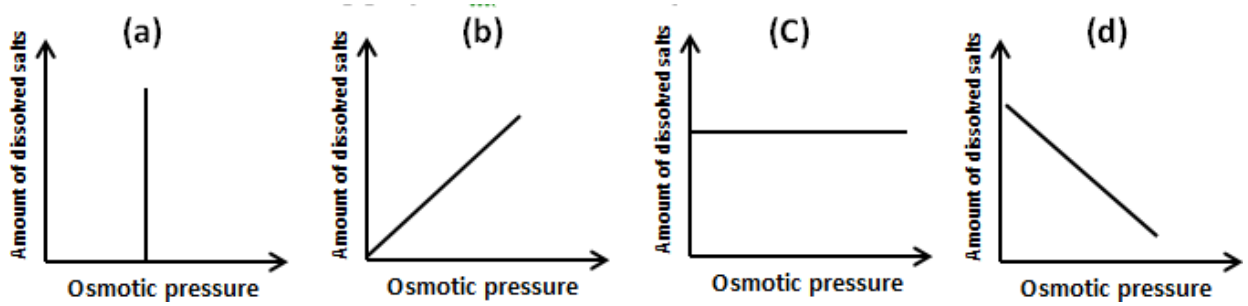
-this is due to……

a) Higher electronegativity of oxygen and lower polarity of water
b) Lower electronegativity of sulphur and higher polarity of hydrogen sulphide
c) Higher electronegativity of oxygen and higher polarity of water
d) Higher electronegativity of sulphur and Lower polarity of hydrogen sulphide

7- The increase in the thicknesses of the soil indicates to all of the following except……

(a) Increasing the effect of living organisms on the rock
(b) Increasing the period of time at which soil is formed
(C) Decreasing the period of time at which soil is formed
(d) The original rocks strongly affected by climate factors

8- Which of the following graphs is scientifically correct?



9- The structural adaptation that common between freshwater fish and salty water fish is.....

a) Compressed body
b) Streamlined body
c) Increased concentration of salts in the cells
d) Decreased concentration of salts in the cells

10-If the boiling point of a liquid is (X) °C at sea level and its boiling point is (Y) °C at mountain level, which of the following is the ratio of X:Y?

a) Greater than one b) Less than one c) Equal to zero d) Equal to one

11- The value 750 mmHg equivalent to .....N/m^2

(a) 99967.11 (b) 89967.11 (C) 101300 (d)1013

12- Which of the following is a reason of abnormal aquatic algae blooms?

(a) Saturation of water with nitrate and phosphate salts
(b) Saturation of water with sulfate and lead salts
(c) Increased salinity of the water body d) Increased solubility of CO_2

13- To treat the weak flowers of plants, fertilizers rich in the element ..... are used

a) P b) K c) N d) S

14-The lowest density of water at .....

(a) Temperature 4 °C
(b) Temperature 5 °C
(C) Temperature 3 °C
(d) Temperature 1 °C

15- The minimum value (V_{rms}) required for propane gas to successes to escape From Earth's atmosphere =.....

a) 11.1 km/s b) 12.2 km/s c) 10.2 km/s d) 11.2 km/s

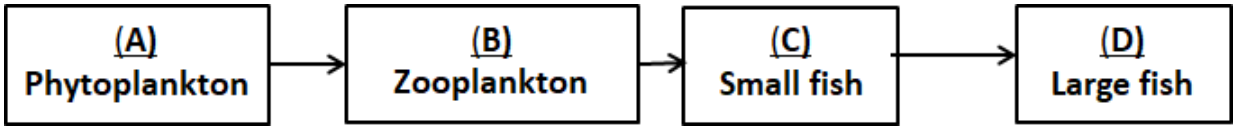
16- The bald eagle is almost extinct because.....

a. The use of DDT, which affected the strength of its wings.
b. The use of chlordane, which affected its ability to reproduce.
c. Lack of raccoons, muskrats and rabbits to feed on
d. The use of DDT, which affected their ability to reproduce

17- A technique that can be used to measure the ratio of harmful gases in the air and heavy elements in the soil is .....

a. Spectroscopy
b. Gas chromatography
c) Liquid chromatography
d) Wet chemical analysis

18- **From the following diagram:**



-All of the following are causes of disruption in this food chain except.....

a. Increasing numbers of (A) and (B)

B) (D) predating (C) in large numbers

c) Increasing numbers of (B) and decreasing numbers of (A) d)Decreasing numbers of (D) and (A)

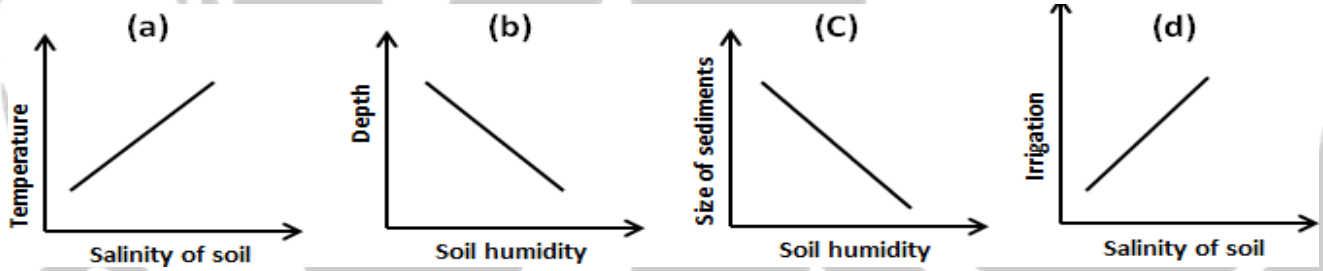
19- If the boiling point of acetic acid under (1 atm) pressure = 118 °C

- Then the expected boiling point under (0.8 atm) pressure =

.....

(a) 111 °C (b) 118 °C (C) 119 °C (d) 125 °C

20- Which of the following graphs is scientifically incorrect?



21- Which of the following represents the largest source of water on the Earth's surface?

A-Oceans. B-Fresh lakes. C-Groundwater. D-Glaciated rivers

22- What is the percentage that oceans, seas and salty lakes represent from the total area of liquid water covering the Earth's surface?

A-70% B- 97% C- 3% D- 30%

23- Which element represents the largest volumetric ratio in the chemical composition of water?

A-Hydrogen B-Oxygen C-Both are equal D-Cannot be determined

24- What type of chemical bonds connect the hydrogen and oxygen atoms in a water molecule?

A-Ionic bonds B-Covalent bonds C-Metallic bonds D-Hydrogen bonds

25- what determines the acidity or alkalinity of water?

A-Concentration of sodium ions

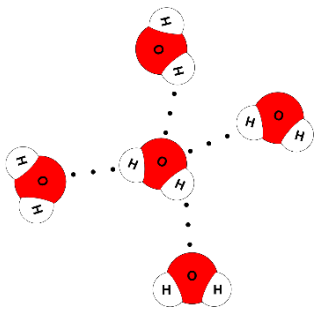
B-Concentration of chloride ions

C-Concentration of hydrogen and hydroxide ions

D-Temperature of the water

26- In the opposite figure what is the type of bond?

	In the water molecule	between water molecules
	Covalent	Hydrogen
	Covalent	Covalent
	Hydrogen	Covalent
	Hydrogen	Hydrogen



27- The plant gets rid of water through the stomata, a process known as……..

A-Transpiration B-Breathing C-digestion D-Absorption

28- What is the biological process that the animals perform and share through it in the water cycle in nature? A-Respiration B-Transpiration C-Photosynthesis D-Growth

29- Four students measured the pH value of four water samples and recorded the valuein the table in the designated place:

Student	a	b	c	d
Water	Sea water	Fresh water	Distilled water	Clouds
PH	7	5.5	5	4.5

30- Table salt solution

	Solution type	relationship [H] and OH	PH value
A	Neutral	[OH = [H+]	Equals 7
B	Acidic	[OH]<[H]	Less than 7
C	Neutral	[OH]<[H]	Equals 7
D	Basic	[OH]>[H+]	Greater than 7

31- Sodium bicarbonate solution

	Solution type	relationship[H] and OH	PH value
A	Neutral	[OH = [H+]	Equals 7
B	Acidic	[OH]<[H]	Less than 7
C	Neutral	[OH]<[H]	Equals 7
D	Basic	[OH]>[H+]	Greater than 7

32- ammonium Chloride solution

	Solution type	The relationship[H] and OH	PH value
A	Neutral	[OH = [H+]	Equals 7
B	Acidic	[OH]<[H]	Less than 7
C	Neutral	[OH]<[H]	Equals 7
D	Basic	[OH]>[H+]	Greater than 7

33- Both the volume of water and the density of water change with temperature

What happens during the procedure described?

Choice	Water Volume	Water Density
A	Increases	Increases
B	Increases	Decreases
C	Decreases	Increases
D	Decreases	Decreases

34- Both the volume of water and the density of water change with temperature What happens during the procedure described?

Choice	Water Volume	Water Density
A	Increases	Increases
B	Increases	Decreases
C	Decreases	Increases
D	Decreases	Decreases

35- Increasing the percentage of CO2 gas in the water works

A-Increase acidification, increase calcification

B-Increase acidification, reduce calcification

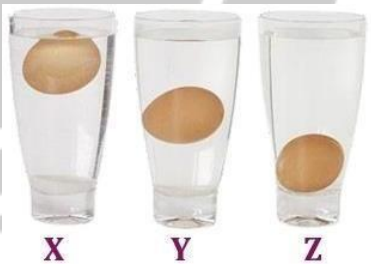
C-Reduce acidification, increase calcification

D-Reduce acidification, reduce calcification

36- Which of the following causes a low Ph

A-Increased O2 B-Increased CO2 C-Decreased O2 D-Decreased CO2

37- The figure shows three cups of water of different salinities, at the same temperature. An egg is placedin each of them (and the eggs are completely identical). The arrangement of the water according to density is:



A-X=Y=Z B- X>Y>Z C-Z>Y>X D-Z>Y=X

38- Ocean currents transport

A- Heat from the poles to the tropics B-Nutrients from the ocean surface to the bottom

C- Nutrients from the ocean bottom to the surface D-Salt from the poles to the tropics

39- The direction in which ocean currents move

	Heat and salts	Nutrients
A	From the poles to the equator	From the ocean surface to the bottom
B	From the poles to the equator	From the bottom of the ocean to the surface
C	From the equator to the poles	From the bottom of the ocean to the surface
D	From the equator to the poles	From the ocean surface to the bottom

40- Which of the following causes decalcification?

A-Increased O2 B-Increased CO2 C-Decreased O2 D-Decreased CO2

41- All of the following are considered a source of dissolved oxygen in water, except:

A) Algae b) Phytoplankton c) Atmospheric air d) Zooplankton

42- Deep-sea fish have arteries and veins that are:

	Strength and durability	Diameter
A	Strong and durable	Thin
B	Small	Thin
C	Strong and durable	Thick
D	Small	Thick

43- The figure shows the migration of salmon, which is adaptation:

A-Behavioral adaptation B-Functional adaptation

C-Structural adaptation D-Functional Structural adaptation

44- The importance of contractile vacuoles in single-celledorganisms living in freshwater is to:

A-Get rid of excess water B-Maintain balance by absorbing water

C-Increase osmotic pressure D-Improve oxygen extraction

45- Osmotic pressure in freshwater fish is:

A-Low, causing water to move into their bodies B-High, causing water to leave their bodies

C-Low, causing water to leave their bodies D-High, causing water to enter their bodies

46- Osmotic pressure in saline water fish is:

A-Low, causing water to leave their bodies B-High, causing water to enter their bodies

C-Low, causing water to enter their bodies D-High, causing water to leave their bodies

47- The streamlined body, mucus and scales help fish to reduce water resistance formoving in water and this is considered as…… adaptation

A-Behavioral B-Functional C-Structural D-Osmotic

48- The importance of the swim bladder (or air sac) in bony fish.

A-Helps them float B-Improves their ability to extract oxygen

C-Reduces water resistance to their movement D-Allows them to withstand high pressure

49- Which of the following fish used to live in deep depths and their body densities are high to bear high pressure?

a) Sardine fish. b)Tilapia fish. c) Ray fish. d) Salmon fish.

50- The thermal energy that is transferred from hot bodies to cold bodies is called:

a) Temperature b) specific heat c) amount of heat d)internal energy

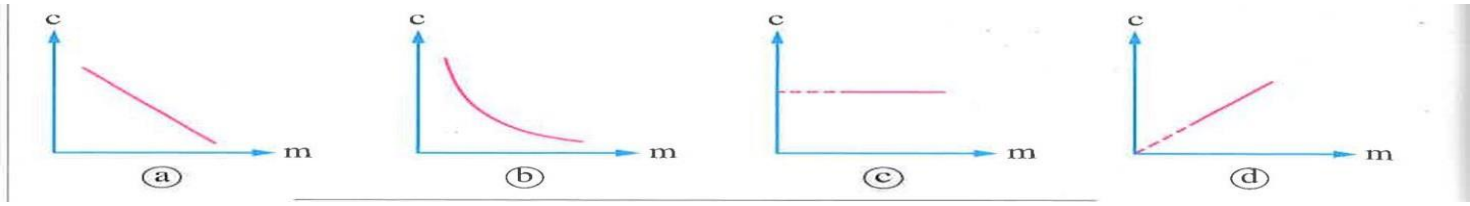
51- Which of the following values on the kelvin scale is equivalent to -10°C?

a) 263 k b) 273 k c) 283 k d) 303 k

52- If the temperature of an object is 283 K, then its equivalent temperature on the Fahrenheit scale is

a)10 °F b) 30 °F c) 50 °F d) 70 °F

53- Which of the following graphs represents the relation between the specific heat (c) of a certain metal and the mass (m) of several bodies of that metal?



54- The following table data shows the specific heat of a group of differentsubstances W,X,Y,Z

Substance	The specific heat(J/KG.°C)
W	450
X	385
Y	897
Z	130

When equal masses of these materials are given the same amount of heat,Which material W,X,Y or Z have a higher temperature?

(a)Substance W b) Substance X c) Substance Y d) Substance Z

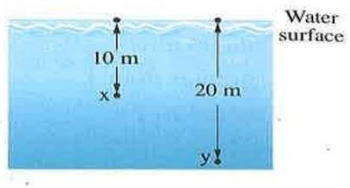
55- Which of the following statements represents the correct arrangement ofthe luminous zones in water according to their depth from top to bottom?

(a)Twilight zone-Aphotic zone-Euphotic zone (b)Aphotic zone-Euphotic zone-Twilight
(c)Euphotic zone–twilight zone-Aphotic zone (d) twilight zone-Euphotic zone-Aphotic

56- The greatest amount of light that penetrates the water surface when theangle between the falling sunlight and the water surface is equal to …….
a) 0°C b) 45°C c) 90°C d) 120°C

57- From the marine organisms that live(s) in the cold regions is/are
A) Coral reefs b)Cod fish c)Tuna fish d)Barracuda fish

58- The opposite figure shows two points (x) and (y) at different depths inside the ocean water. If the energy of visible light at point (x) is E, the energy of visible light at point (y) is approximately equal to
A) E B) ½ E c)1/3 E D) ¼ E



59- When salmon fish migrates from ocean to river, the pressure on its body at the same depth
A- Decreases B- increases C- Doesn't Change D- cant be determined

60- Which of the following is not a measuring unit of the pressure?
A-N/m^2 B-Bar C-Joule D-Pascal

61- 1 Pascal =……..Bar
A-10^4 B-10^{-4} C-10^5 D-10^{-5}

62- If the pressure at a point inside liquid equal to 2 bar, then it is equivalent to …….
A-2 x10^4 Pascal B-2x10^{-4} Pascal C-2x10^{-5} Pascal D-2x10^5 Pascal

63- What is the effect of increasing the concentration of dissolved substances in water on its density?
A-Decreases. B-Increases. C-Does not change. D-Changes randomly

64- What is the main effect of adding solute to water; on its vapor pressure?
A- The vapor pressure decreases B-The vapor pressure increases
C-The vapor pressure is not affected D-The vapor pressure increases then decreases

65- The boiling point of a solution at a mountain top is 108°C, therefore the boiling point of the same solution on the Earth's surface is

A- 106°C B- 104°C C- 108°C D-110°C

66- The role of predatory fish in maintaining ecological balance in aquatic ecosystems leads to

A-Increasing the number of small fish B-Controlling the number of prey fish

C-Reducing the nutrient levels D-Enhancing algal growth

67- When nutrient levels in an aquatic system are excessive, that leads to …….

A) Decrease in plant growth C) Increase in biodiversity

B) Abnormal algal blooms D) Stabilization of the ecosystem

68- Which of the following is an example of overfishing impact on ecological balance?

A-Increase in water quality C- Decline in predator fish populations

B- Rise in biodiversity D-Stability in prey populations

69- The most abundant gas in Earth's atmosphere is:

A. Oxygen B.Argon C. Nitrogen D.Carbon dioxide

70- Nitrogen gas represents about…… of the volume of Earth's atmosphere.

A. 0.1 % B.0.9 % C. 21 % D. 78 %

71- Oxygen gas represents about……of the volume of Earth's atmosphere.

A. 0.04 % B.0.93 % C. 21 % D. 78 %

72- Argon gas represents about ……of the volume of Earth's atmosphere.

A. 0.04 % B. 0.93% C. 21 % D. 78 %

73- Carbon dioxide gas represents about……of the volume of Earth's atmosphere.

A. 0.04 % B. 0.93 % C. 21 % D.78 %

74- The …… Layer has the ability to absorb short-wave ultraviolet radiation.

A. Argon B. ozone C. nitrogen D. oxygen

75- The ozone layer is found at an altitude of approximately …… from The Earth's surface

A. 10 km - 25 km B. 15 km - 35 km C. 15 km - 45 km D.10 km - 55 km

76- …… is the closest layer to the Earth's surface.

A. Ionosphere B. Mesosphere C. Stratosphere D. Troposphere

77- If the air temperature at a certain location on Earth's surface is 40 °C. What is its temperature at the top of a mountain of a height 1760 m from that location?

A)0 °C B) 10 °C C) 20 °C D)30 °C

78- is the lowest layer of the atmosphere with the lowest temperature (-90 ^{o}C).

A.Ionosphere B. Mesosphere C. Stratosphere D. Troposphere

79- Most meteors falling from space burn up as they pass through the ……layer, which protects the Earth from them.

A. Troposphere B. Stratosphere C. Mesosphere D. Ionosphere

80- If the atmospheric pressure at the top of a mountain is 750 mm.Hg, it is equivalent to …….

A. 99967.11 N/m^2 B. 89967.11 N/m^2 C. 101300 N/m^2 D.1013 N/m^2

81- The freezing point of the pure water equal to …….

A.0 °F B. 0 K C. 32 °F D. 32 K

82-The boiling point of the pure water equal to …….

A. 100 °F B. 212 K C. 373 °F D. 373 K

83- If the temperature of an object is 283 K, then its equivalent temperature on Fahrenheit scale is

A. 10 °F **B. 30 °F** **C. 50 °F** **D. 70 °F**

84- The transfer of heat in the form of electromagnetic waves is .....

A) Conduction **B) Convection** **C) Radiation** **D) All the previous**

85- The study of soil is a branch of environmental and agricultural sciences that focuses on:

(a) understanding the properties of soil C. the composition of the soil

(b) the soil effect on plants, animals and environment D. All the previous

86- Soils are formed....., but very .....

A	Continuously	slowly
B	Continuously	rapidly
C	Discontinuously	slowly
D	Discontinuously	rapidly

87- Weathering occurs as a result of..... processes

(a) physical only B. chemical only

C. biological only **D. physical, chemical, or biological**

88- are the largest component of soil

A. Minerals **B. Organic matter** **C. Water** **D. Gases**

89- primary minerals in the soil are the result of the fragmentation of rocks by .....factors.

A. physical only **B. biological only** **C. chemical and biological** **D. chemical and physical**

90- The ability of the soil to retain water varies depending on:

(a) the size of the soil grains only C. the temperature only

(b) the size of the soil grains and temperature D. None of these

91- The soil compaction leads to :

A. the formation of hard, petrified layers beneath the soil surface

B. reducing the soil ability to absorb water and air

C. the soil hinders the growth of plant roots and leads to poor agricultural yields

D. All the previous

92- Which of the following practices leads to the soil compaction?

(a) The use of heavy agricultural machinery in agricultural areas excessively

(b) Groundwater containing salts is transported to the soil surface by capillary action

(c) The repeated irrigation of the soil over time

(d) Flood irrigation of the soil

93- One of the biggest mistakes in agriculture is aiming to grow a single crop on the same soil and repeat this for years in a row is

a- soil compaction

b- increase in the soil salination

C. increase in the soil efficiency and its firtility

D. causes the soil to be exhausted and lack some of the nutrients necessary for the plant to grow

94- In agricultural areas that rely heavily on manufactured nitrogen fertilizers to increase crop yields, excessive ..... contamination of the soil is observed

A. Nitrate **B. iodine** **C. lead** **D. mercury**

95- The figure shows a baby of Blue Baby Syndrome, as a result of drinking…….-contaminated water.

A. mercury **B. lead** **C. nitrate** **D. chlorine**

96- All the following from the ways of soil conservation **EXCEPT**

a. Sustainable agricultural practices

b. Using crop rotation techniques

C. Use the "no-till farming" technique

D. Growing the same crop in the same soil for several consecutive times

97- All the following from the consequences of the falling of acid rain on the soil **EXCEPT**

(a) eroding essential minerals in the soil

(b) decreasing the level of calcium and magnesium in the soil

(c) reducing soil fertility

D. decreasing the level of aluminum in the soil

98- Which of the following measures is preferred to address the effects of acid rain on soil?

(a) Adding large amounts of chemical fertilizers

(b) Increasing the use of pesticides

C. Using lime fertilizers to neutralize acids

D. Removing contaminated soil and discarding it

99- Soil humidity is the total amount of……found in the soil's fine pores or on its surface.

A. Water **B. air** **C. oxygen** **D. nitrogen**

100- Element……in the soil is essential for healthy growth of plant and flower **formation.**

(a) Nitrogen (N) B. Phosphorus (P) C. Potassium (K) D. Aluminum (Al)

101- Element……in the soil helps strengthen plant roots.

(a) Nitrogen (N) B. Phosphorus (P) C. Potassium (K) D. Aluminum (Al)

102- Element……in the soil is essential for the greening of plant leaves.

(a) Nitrogen B. Phosphorus (P) C. Potassium (K) D. Aluminum (Al)

103-……is the foundation of an ecosystem and its health.

A. Deforestation

B. preserving biodiversity

C. increasing the use of fossils fuel

D. increasing the use of non-renewable resources

104-…… Using is an example of resource sustainability

A. solar energy **B. coal** **C. fossils fuel** **D. non-renewable energy**

105- deforestation leads to ……

(a) the loss of natural habitats for millions of animal and plant species

(b) changes in local and global climate

C. the loss of biodiversity

D. All the previous

106-…… is the process of turning fertile land into barren land

A. Pollution **B. Desertification** **C. Deforestation** **D. Global warming**

107- What is the purpose of using activated carbon in water treatment?

A) To increase water temperature
C) To absorb organic materials and pollutants
B) To add minerals to the water
D) To filter out bacteria only

108- Which pollutants are often measured in air analysis by using UV spectroscopy?

A) Phosphates and nitrates
C) Nitrogen oxides and ozone
B) Lead and cadmium
D) Organic matter and chlorine

109- Which of the following is a pesticide that is used to control insects and the diseases they cause?

A)Formaldehyde B) Lead C) Chlordane D) Chloroform

110- Which of the following can be separated and analyzed by Chromatography?

A)Pesticides B) Ozone C) Heavy metals D) Nitrogen oxides

111- What is the main effect of lead exposure on human health?

Ⓐ Increased physical ability
Ⓑ Development of nervous system issues
Ⓒ Improved bone health
Ⓓ Reduced cancer incidence

Essay

1- During the day, beach sand is very hot and seawater is cold, and at night the sand Is cooler than the water. ..... Give the scientific explanation

……. ……

2- What happened when? Vapour pressure of a liquid becomes equal atmosphere Pressure?

……

……

3 -If the temperature at the top of the mountain 0 oC and the height of the mountain 3520 m, Calculate the temperature at the base of the mountain

……

……

Problems

1- A 1.2 kg block of silver heats up from 25°C to 100°C. If the specific heat capacity of silver is 235 J/kg·K, how much heat is absorbed?

……

2- A copper block with a mass of 0.5 kg is heated from 25°C to a final temperature of 75°C. Calculate the amount of heat absorbed by the copper. (Specific heat of copper: 385 J/kg·K)

……

3- If a 0.5 kg block of aluminum cools from 75°C to 25°C, how much heat does it release? (Specific heat capacity of aluminum: 897 J/kg·K)

……

4- A piece of aluminum with a mass of 200g and a temperature of 80°C is dropped into a quantity of water at room temperature. If the final temperature of the system is 40°C, calculate the amount of heat gained by the amount of water. The specific heat of aluminum is 897 J/kg.K.

……

5- A 250 g aluminum block is heated to 100°C and dropped into a container of water at 30°C. If the final temperature of the aluminum is 60°C, calculate the amount of heat transferred from the aluminum to the water. (Specific heat capacity of aluminum: 897 J/kg·K)

……

6- A copper plate absorbs 9,625 J of heat. Its mass is 0.4 kg, and its initial temperature is 30°C. What is its final temperature? (Specific heat of copper: 385 J/kg·K)

……

7- A slide with an area of 0.05 m^2 is subjected to a total force of 1,250 N. Determine the pressure applied to the slide.

……

8- A surface with an area of 0.2 m^2 is exposed to a total force of 9,000 N. Calculate the pressure exerted on the surface

……

9- A plate with an area of 0.15 m^2 experiences a total force of 450 N. What is the pressure acting on the plate?

……

10- A rectangular surface of area 30 cm^2 is subjected to a total force of 3.6 N. Calculate the pressure acting on the surface

……

11- An object with an area of 0.03 m^2 is exposed to a pressure of 5.0×10^3 N/m^2. Calculate the total force acting on the object.

……

12- Calculate the total pressure at a point 30 meters below the surface of the sea. Given that the density of seawater is 1025 kg/m^3, the acceleration due to gravity is 9.8 m/s^2, and the atmospheric pressure at the sea surface is 1.013×10^5 Pa.

……

13- Calculate the total pressure at a point 50 meters below the surface of the sea. Assume the density of seawater is 1025 kg/m^3, g = 9.8 m/s^2, and the atmospheric pressure at the surface is 1.013×10^5 N/m^2.

……

14- A point at the bottom of a freshwater reservoir has a total pressure of 3.013×10^5 Pa. If atmospheric pressure is 1.013×10^5 Pa, calculate the depth of the water. Assume the density of water is 1000 kg/m^3 and g = 9.8 m/s^2

……