

Q.No.1

(A) Define vaccine and Antibiotics. Give differences between them.

VACCINE:

It is the administration of killed or attenuated live (half-killed) micro-organisms (bacterial or virus) into the body to protect it against the specific disease by stimulating the formation of antibodies.

For example,

Vaccines for measles, chickenpox, COVID-19 etc.

ANTIBIOTICS

They are used to treat or prevent some form of bacterial infection. Small molecular compounds used to protect humans and animals by killing bacteria or preventing them from reproducing and spreading.

For example

Penicillins, Cephalosporins, Aminoglycosides and Tetracyclines etc.

Difference between Vaccines and Antibiotics.

	VACCINES	ANTIBIOTICS
1) Definition	The administration of dead or inactivated micro-organisms used to provide immunity to particular human beings.	The small molecular compounds used to treat bacterial infections in animals and
2) Source	They are produced by live or inactive microbes, toxins and antigens.	These are prepared naturally or synthetically by different chemicals.

	VACCINES	ANTIBIOTICS
3) Function	These are used to build immunity and prevent viral infections-	They are used to treat bacterial and parasitic infections
4) Adverse Effects	It can cause allergy and swelling	It can cause gastric discomfort and allergic reaction-
Example	Vaccines for COVID-19, polio, smallpox etc	Penicillins, Cephalosporins etc

(B) Differentiate between cyclones, Tsunami and typhoons.

INTRODUCTION

Cyclones, tsunami and Typhoons all are natural disasters but they are distinct phenomena.

DIFFERENCES BETWEEN THEM

1- FORMATION AND NATURE

Cyclone

They are formed by large scale system of winds around a low-pressure centre forming in tropical and sub-tropical regions.

Typhoon

It specifically refers to tropical cyclone formed by large scale system of winds around a low-pressure centre in the northwestern Pacific Ocean-

Tsunami.

It is a series of oceanic waves caused by undersea earthquakes, volcanic eruptions or other underwater disturbances-

2. GEOGRAPHICAL NAMES

Cyclone

It is used for storms in The South, Pacific and Indian Ocean.

Typhoon

The term is used for storms in the northwestern Pacific Ocean-

Tsunami

It is a geographical event not tied to specific regions affecting coastal areas globally-

3. METEOROLOGICAL CHARACTERISTICS

Cyclone

They are characterized by intense low pressure systems, strong winds and heavy rainfalls-

Typhoon

They are also characterized by intense low pressure systems, strong winds and heavy rainfalls just in a specific region-

Tsunami-

It is not a meteorological phenomenon; rather it involves the displacement of water due to underwater seismic activity-

4. CAUSES

Since cyclone and typhoon are basically the same phenomenon occurring in different regions their causes are
Cyclone/Typhoon

Atmospheric conditions leading to the development of low-pressure systems over warm ocean waters

Tsunami-

Underwater earthquakes, volcanic eruptions or landslides

causing vertical displacement of water results in tsunami.

S. SCALE OF IMPACT

Cyclone/Typhoon

Localized impact on coastal regions, potentially causing storm surges, flooding and wind damages.

Tsunami-

It can have widespread and devastating impact across entire coastlines reaching far inland.

CONCLUSION

Cyclones and Typhoons are same meteorological phenomena occurring in different regions while tsunami is a natural disaster caused by underwater earthquakes.

C. Note on Galaxy-

GALAXY

It is a fundamental unit of universe. The vast, gravitationally bound systems of stars, interstellar gases, dust and dark matter.

1. Components

1. Galaxy is composed of stars, dark matter and interstellar medium.

i. Stars-

Galaxy host billions to trillions of stars each with its unique life cycle.

ii. Dark matter

It is a significant invisible component providing gravitational stability.

iii. Interstellar Medium

Gas and dust between stars which are crucial for star formation.

2. Structure

Based on the structure, galaxies are classified into three types

Spiral Galaxies

It is characterized by central bulge, spiral arms and a rotating disk.

Elliptical Galaxies

They are oval-shaped with stars orbiting randomly lacking distinct structures.

Irregular Galaxies

They lack regular structure often resulting from gravitational interactions with other galaxies.

3. The Milky Way

The Milky Way galaxy, our galaxy is a barred spiral galaxy. It has diameter of 105 light years and contains 200 billion stars. The nearest neighbour is Andromeda Galaxy about 2,200,000 light years away.

In summation, galaxy represents the cosmic entity that shape the structure of universe.

QNo. 2

(A) Difference between good and bad fats.

	GOOD FATS	BAD FATS
1- Types	They are monosaturated and polyunsaturated fats	They are saturated and trans fats
2- Chemical Structure-	They have double bonds in their fatty acid chains.	The saturated fats have single bonds while trans fats are artificially created through hydrogenation.
3- Sources and Composition-	They are found in plant based oils, nuts, seeds and fatty fish. They tend to be liquid at room temperature	They are found in animal products, processed foods and certain cooking oils. They can be solid at room temperature or artificially solidified.
4- Health Impacts	Support cardiovascular health by improving cholesterol levels and providing essential fatty acids.	It can raise LDL cholesterol contributing to heart diseases.
5- Examples	Olive oils, nuts, seed oil. etc	butter, full fat dairy, margrines etc.

(B) USES OF FOLLOWING-

i. Vitamin B-Complex

1. It is used for energy metabolism - Vitamin B₁, B₂ and B₃ play crucial role in converting food into energy by aiding in metabolic processes.
2. Vitamin B₇ and B₁₂ contribute to maintenance of cellular health.
3. They are essential for proper functioning of nervous system and neurotransmitter synthesis.
4. Vitamin B₆, B₉ and B₁₂ are vital for the production of red blood cells, preventing anemia.
5. Vitamin B₇ and B₃ are essential for healthy hair, skin and nails.

ii. Vitamin E

1. It acts as a powerful antioxidant, protecting cells from oxidative stress and damage caused by free radicals.
2. It promotes skin health by supporting collagen production and protecting against UV radiation.

Teacher's Signature _____

3. It supports the immune system enhancing body's ability to defend itself against infections.
4. It helps to maintain cardiovascular health.
5. Vitamin E contribute to eye health.

ii) Vitamin D

1. It facilitates the absorption of calcium, crucial for strong bones and teeth.
2. It promotes bone mineralization preventing osteoporosis and rickets.
3. It is vital for immune system support.
4. Vitamin D regulates mood and prevent depression.
5. It contribute to muscle health and function.

iv. Iron

1. It is key component of hemoglobin and facilitates the transport of oxygen in the body.
2. It is involved in the production of Adenosine triphosphate (ATP), body's energy currency.
3. Iron aids in the production of white blood cells.
4. It plays a role in cognitive functioning especially during growth.
5. It is essential to prevent anemia (iron-deficiency).

(c) FOOD ADULTERATION

It refers to the intentional addition or contamination of food products with substances that may be harmful for health.

This deceptive practice compromises the safety, nutritional value and overall quality of food

posing risks to consumer health-

TYPES

There are two types

1. Intentional Adulteration:-

Intentional addition of harmful substances to enhance appearance or increase weight often for economic gains-

2. Incidental Adulteration

Unintentional contamination during cultivation, processing storage or transporting-

EFFECTS

Food adulteration pose certain risks like health risk, undermining consumer confidence etc-

1. Health Risks-

The consumption of adulterated food can lead to various health issues ranging from mild illnesses to severe toxicity-

2. Economic Fraud

Consumers pay for lower quality or misrepresented products leading to financial losses

3. Undermining Consumer Confidence-

Food Adulteration erodes trust in food safety regulations and food industry as a whole-

SOLUTIONS:

1. Strict Regulations and Enforcement-

Governments should enact and enforce strong food safety regulations with severe penalties for adulteration-

2. Regular Monitoring

Regular inspections and testing of food products at various stages of supply chain can detect adulteration.

3. Public Awareness

Educating consumers about recognizing and reporting adulteration empowers them to make informed food choices.

CONCLUSION

Food adulteration poses health risks and erodes trust in food companies. It can be addressed by regulatory measures like monitoring, public awareness and the guilty should be held accountable.

D. FOOD PRESERVATION

Food preservation refers to various techniques and methods employed to extend the shelf life of food, preventing spoilage, decay and growth of micro-organisms.

METHODS

1. Refrigeration

It refers to keeping food at low temperatures typically around $0-4^{\circ}\text{C}$ to slow down the growth of micro-organisms and maintain freshness. Perishable items like dairy products, meats, fruits and vegetables are commonly preserved foods through this method.

2. Canning

It involves heating food in a sealed container to destroy or inactivate micro-organisms, enzymes and air, preventing Spoilage - Vegetables, soups and various sauces like marinara are stored this way.

3. Drying / Dehydration:

It refers to removing moisture from food items, ~~in~~ inhibiting growth of bacteria, yeast and mold, thus extending shelf life - Commonly preserved food through this method include dried fruits, jerky, seaweed, herbs etc -

4. Freezing

It involves lowering temperature of food to below freezing, inhibiting microbial growth & enzymatic reactions - Meats, prepared meals, vegetables and fruits are preserved through freezing -

5. Pickling

It is method of ~~storing~~ submerging food in a solution of vinegar, salt and spices creating acidic environment that prevents growth of spoilage micro-organisms. Vegetables and some meats are pickled to preserve for longer periods.

CONCLUSION

Preservation methods helps ^{to} maintain quality of food, nutritional value over extended periods of time reducing wastage and spoilage -