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QUESTION NO: 1:

A. Differentiate between Vaccine and Antibiotics. Give differences between them.

VACCINE:

A vaccine is human invention. It consists of weakened or inactivated form of pathogen, providing immunity against a particular infectious disease.

Working principle:

Vaccine basically stimulates the immune system to recognize and defend against the actual infectious agent.

Types of Vaccines

There are different types of vaccines now available. The major types of vaccine include:

- i- Inactivated or killed vaccines.
- ii- Live attenuated vaccines.
- iii- mRNA vaccines.

Examples:

- Polio vaccine.
- Hepatitis B vaccine.

ANTIBIOTICS:

Antibiotic is a substance that kills or inhibits the growth of bacteria. Antibiotic drugs are mainly used to treat bacterial infections in humans.

Working principle:

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Antibiotics work by targeting specific processes or structures in bacteria, depriving them of their ability to survive and reproduce.

Major example is of Penicillin. It works by inhibiting the synthesis of bacterial cell walls.

Vaccine

Antibiotic

1) Purpose

→ A vaccine is designed to prevent infections caused by viruses or bacteria.

→ Antibiotic is used to treat bacterial infections.

2) Working Principle

→ A vaccine works by stimulating the immune system.

→ Antibiotic works by inhibiting synthesis of specific structures in bacteria.

Target

Vaccine targets viruses, bacteria or other such pathogens.

These specifically target bacteria not viruses.

Timing of Use

Usually administered before exposure to a pathogen.

Administered after a bacterial infection is diagnosed.

•) Vaccines are the preventive measure

•) Antibiotic is a therapeutic measure.

B- Differentiate between cyclone, Tsunami and Typhoon.

Cyclone

Tsunami

Typhoon

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Definition

Cyclone is a generic term for system of winds rotating inwards to the area of low atmospheric pressure.

Tsunami is a series of ocean waves with excessively long wavelengths and very high energy.

Typhoon is a term for a mature tropical cyclone in the North-West Pacific Ocean.

Causes

Refer to low-pressure system of air rotation.

Tsunami's are caused by underwater earthquakes, volcanic eruptions or landslides.

Are the low pressure waves moving towards high pressure.

Location

Cyclones occurring in South Pacific and Indian Ocean. ✓	Can travel along entire ocean basins at high speed.	- System of waves in Northwest Pacific Ocean ✓
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C- Write a short note on Galaxy.

GALAXY:

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A galaxy is composed of large number of stars, dust and dark matter; bound by gravity.

Types:

Two different types of galaxies include:

Spiral galaxy:

have a central bulge surrounded by spiral arms. ✓

Elliptical galaxy:

- 1) Shaped like elliptical. ✓
- 2) No spiral arms. ✓

Irregular galaxies:

- 1) These lack well defined structure. ✓
- 2) Often smaller and less organized. ✓

Milky Way.

The galaxy in which our solar system exists is Milky Way. It is a spiral galaxy and inhabits large number of stars including the sun. It has other objects like planets and moon etc.

QUESTION NO: 2
Differentiate between good fats and bad fats - Give Examples.

I

Good fats

→ Good fats also known as healthy fats play important role in supporting our health.

Bad fats

Bad fats are the unhealthy fats which are trans and unsaturated in nature.

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Examples

i - Monosaturated fats:

→ The good fats are present in olive oil and nuts.

→ Are associated with good heart health.

i) Saturated fats:
→ Found in red meat.

→ Raise bad cholesterol levels.

ii - Polyunsaturated fats:

→ Found in fatty fish and walnuts.

→ Crucial for overall health.

ii) Trans fats:

→ Artificially created through hydrogenation of oils.

iii) Omega-3 fatty acids:

→ polyunsaturated fats
→ Support heart and brain health.

→ Reduce levels of bad cholesterol.

Occurance

→ Commonly found in plant-based oil.

→ Present in processed foods.

B. Give 5 uses of each of the following:

i- Vitamin-B complex:

Vitamin B complex play essential roles in daily -functions of our body.

1.) Energy metabolism:

Vitamin B complex plays a vital role in conversion of food into energy.

2.) Cell division and DNA synthesis:

B-complex helps in cell division and DNA synthesis critically more during cell repair.

3.) Nervous system function:

Nervous system function is supported by B-complex. as they improve the nerve cells.

4.) Red blood cell formation:

Vitamin B-complex majorly B₉ involved in red

5.) Skin and hair health: ^{blood cell formation.}

Some fraction of B-complex is involved in skin and hair health.

VITAMIN E :

Vitamin E is a fat-soluble vitamin involved in different important functions of body.

i- Antioxidant function protecting cellular function.

ii- Immune system support.

iii- Improvement of neural health.

iv- Helps improve cardiac function.

v- Role in skin maintenance.

Vitamin D:

Vitamin D is a fat soluble vitamin having role in major functions. ✓

① Improvement of Immune health:
Vitamin D plays a role in upgradation of our immune system.

② Bone health:

Vitamin D is crucial for bone health as its deficiency leads to rickets and bone degradation.

③ Calcium absorption:

Acts as a precursor for absorption of calcium in bones. This renders vitamin D vital for normal bone function. ✓

④ Increased mental health.

⑤ Improves muscular system and has role in cardiovascular ^{health} areas.

Iron:

Iron is an important element required for normal ✓ function.

① Oxygen transport:

Being part of haemoglobin iron plays vital role in oxygen transport across whole body.

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② Energy metabolism:-
Involved in energy metabolism as it plays major role in formation of ATP.

③ DNA synthesis:
It is cofactor for enzymes involved in DNA synthesis, rendering it crucial for DNA replication.

④ Brain function:-
It plays role in normal functioning of neurotransmitter assisting brain function.

⑤ Immune system function:-
Iron is involved in normal function of immune system as it plays role for the formation of white blood cells and its function.

C- Explain food adulteration, its effects, types and solution:-

Food adulteration:

It refers to the practise of adding inferior, harmful or cheap substances to food thereby affecting the quality of food.

Types of adulteration includes:

- 1) Fraudulent packaging.
- 2) By removal of a substance.
- 3) Substitution.
- 4) Contamination.

-) Presence of extraneous matter.
-) Intentional adulteration.
-) Incidental adulteration.

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Effects:

- ① The quality of food is compromised.
- ② Advent and spread of diseases.
- ③ Rise in health conditions. ✓
- ④ Loss of consumer confidence.
- ⑤ Negative impact on environment. ✓
- ⑥ Social consequences leading to unrest among society. ✓

Solutions:

- ① Curb on the companies involved.
- ② Strict laws and implementation of food quality laws.
- ③ Imposition ✓ of fine.
- ④ Quality check and strict policies.

D- Five methods of food preservation.

i- Refrigeration:

→ Keeping food at low temperature slows down the growth of microorganisms and enzymes preserving food.

ii- Freezing:

Freezing is another successful method of preservation at low temperature.

iii- Canning:

→ Involves heating food in a closed container to destroy microorganisms. For preserving fruits etc.

iv- Drying / Dehydrating:

→ Removing moisture to avoid dry contamination is another method.

v- Pickling:

1) Preserving food in solution of vinegar, salt and spices.

2) For vegetables like cucumber and fruits.

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