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Question no. 1

A- Differentiate between good and bad fat. Give examples.

Good fats are those fats that are essential for the body. There are three types of fats: Saturated fats, unsaturated fats and trans fats.

- Saturated fats: They are solid at room temperature, such as milk, cheese, meat etc. If saturated fat raises cholesterol less than 10 per cent daily, they are healthy fats.
 - Fish and poultry have less saturated fat

- Unsaturated fats: It is liquid at room temperature. They are of two types:

Mono-unsaturated fats:

- Lower LDL (Low density lipoprotein)
They are bad for human health.
- Increase HDL (High density lipoprotein)
Good for human health. They are found in nuts, grains, seeds, vegetables etc.

Poly-unsaturated fatty acids

Omega-3 and omega-6 fatty acids
Soyals, grains, nuts, sunflower, sesame oils.

Trans-fats: They are found in bakery products. It raises cholesterol level.

- Triglycerides (good fats) are reserve source of energy. They produce vitamins (A, D, E, K) fat soluble vitamins.

- These vitamins prevent the radicals from spreading into body, released by hydrogenation of fatty acids.

- It regulates prostaglandins and steroid hormones release.

- They maintain proper cellular functioning and coordinate the brain functioning.

B- Give five uses of each of the following:

Vitamin B complex: They are fat soluble vitamins. They can be vitamin B₉, B₁, B₂, B₃, B₅, B₆, B₁₂

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- Vitamin B₁ (Thiamin), B₂ (Riboflavin), B₃ (Niacin), B₅ (pantothenic acid), B₆ (pyridoxin), B₉ (Biotin), B₁₂ (folic acid) etc.

- Vitamin's are essential to the normal functioning of body.

- B₉ (Biotin) prevents from aging. Prevents anti-free radicals process of aging in skin. Essential for the regeneration of skin.

- Folic acid (B₁₂) it is a complex of substances that regulate hormonal functioning. It is essential for lactating women.

- Vitamin B₁ (Beri Beri: weakened heart, nerve and muscle degeneration, pain and swelling)

- B₂ for eye irritation, inflammation and breakdown of skin cells.

- B₃: Pellagra (The 3 D's, Dermatitis, Diarrhoea, Dementia)

Vitamin E:

It inhibit lipid peroxidation. It prevents free radicals generated from lipids breakdown from entering

into cells. It helps membrane in permeability of selective components.

Vitamin D:

It prevents the osteolysis of bones. It prevents bones from degeneration. Vitamin D can be get through food or from sun. It is essential to the normal functioning of bones.

Iron:

Iron is a necessary component of blood cells formation. Hemoglobin cannot synthesize blood cells without iron. Iron attaches as receptor on hemoglobin cell, along with magnesium as an essential component form blood molecules. Moreover, it prevents blood from clotting with the help of vitamin K. Green vegetables and meat is the rich source of iron. However, it is also available in market in the form of iron supplements.

What is food adulteration?

Food adulteration is the contamination of food caused by harmful or deleterious mixing of substance into food or the removal of essential components from food.

Types of food Adulteration:

- ① Poisonous and deleterious substances
- ② Filth and foreign matter
- ③ Economic Adulteration: Food is adulterated by removal of valuable constituents. For instance, water is added in meat to increase its volume and weight. Similarly, olive oil is diluted with tea tree oil.
- ④ Microbial contamination: Presence of 'Salmonella' in the food.
- ⑤ Intentional Adulteration: Addition of washing soda and chalk in sugar to increase its quantity
- ⑥ Incidental Contamination: Presence of pesticides residues, tin from can, micro-plastics from plastic cans, dropping of rodents and larvae in food.

Effects:

① Stunted growth of children: Pakistan is second biggest milk consumer country after Ireland. However, by WHO, more than 50 per cent children of Pakistan has stunted growth. Per capita yearly consumption of Pakistan is 117 litre milk. 124 is of Ireland.

② Causes Diseases: Contaminated food cause liver, kidney and lungs disorders. Due to contaminated food and Beverages Hepatitis A has spread to the half of the population of Pakistan. Kidney damage and dialysis is the common event.

Solution:

① Punjab food authority must play its part on launching crack down on food criminals.

② Pakistan has devolved the jurisdiction of food and health to the

provinces. With the devolution of power, every province is responsible for its own department of food. There is a need of coordination by state and provinces on this matter.

Explain Five food purification methods:

'Food preservation is any of the method by which food is preserved from microbial attacks or other contaminants after harvesting and slaughter.'

- Preservatives are chemical substances that prevent spoilage, browning, discoloration, fermentation appearance of food. It prevents texture of food as well.

There are following methods of food preservation:

- ① **Freezing:** Freezing is one of the most common methods of food preservation. When food is frozen, water in the food is frozen as a result microbial activities dependent on availability of water (80%) stops.
- ② **Acids:** Microbs are sensitive to acids. When acids are added they halt their activity in a chain like process.
- ③ **Sugar and salt**
Meats are preserved by placing them in salts. Sugar syrups are used for fruits.
- ④ **Drying:**
By removing water from food. It can be preserved by drying.
- ⑤ **Confit:** Meat is preserved by salting it. Cooking it at 100 °C in some kind of fat and then preserving it. This method was common in Europe before refrigerators.

Question 1

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Define vaccine and antibiotics:

"Vaccines are given to create resistance in human body to specific disease causing microorganisms such as bacteria and viruses".

Anti-biotics : Anti (Against) bios (life)

"Antibiotics are chemical compounds used to kill or inhibit the growth of microorganisms".

Vaccine

- Contain an agent that resembles to disease causing micro-organism
- Types : Attenuated, killed, Toxoid, Conjugated
- Given as a prior preparation in order to make antibodies

Antibiotics

- Killed micro-organisms : medicines that kill micro-organisms
- penicillin, Cephalosporin, Aminoglycosides, Tetracyclin, Macrolides
- prescribed by doctor after disease

Vaccines

- Discovered by Edward Jenner
- provide protection for a long period of time

Antibiotics

- By Alexander Fleming
- provide protection for a short period of time

Differentiate between cyclones, Tsunami and Typhoons

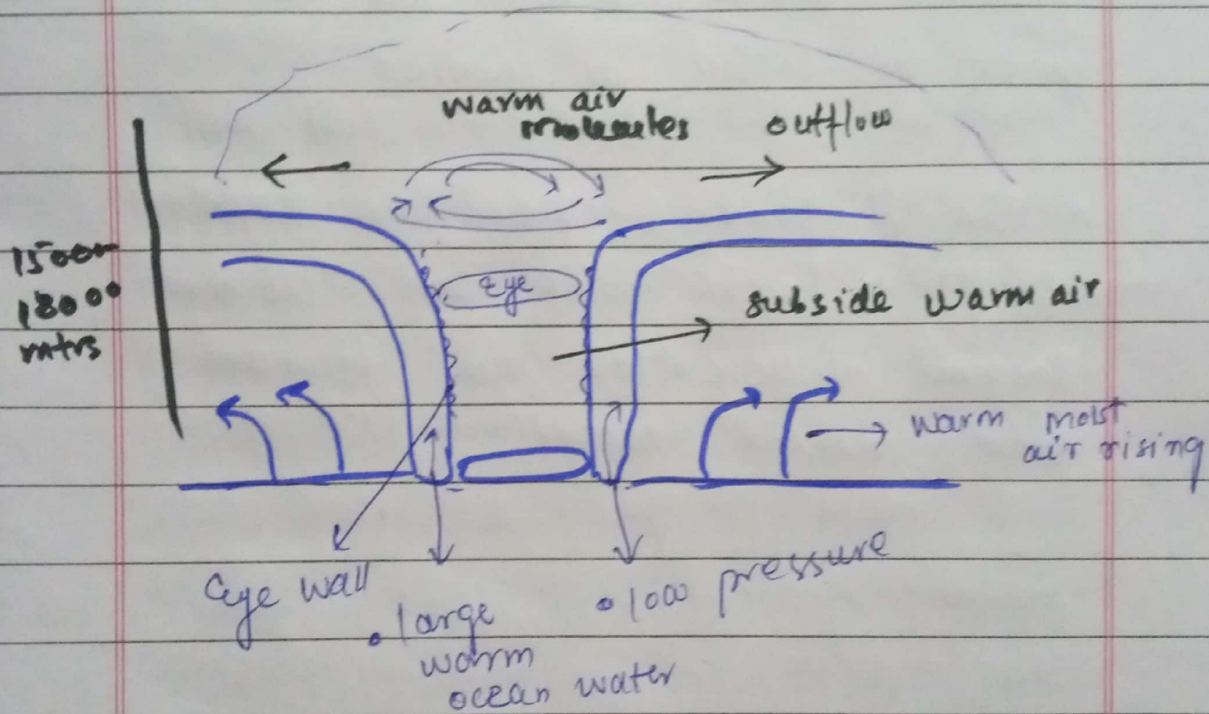
Tropical cyclones:

These are closed circulatory system in the atmosphere which combines strong winds and low pressure that rotates counter clockwise in northern hemisphere and clockwise in southern hemisphere.

- In Indian ocean they are called cyclones. In South China sea they are called Typhoons.
- In western Australia, they are

Called Willy Willies. In East and West of USA, they are called Hurricanes

"Tropical cyclones originate over ocean in tropical areas and coastal regions"



- Air cools become dense and move upwards. It intensified the storm by increasing the diameter of the storm

TSUNAMI :

- Tsunami is a Japanese word meaning 'harbour wave'. These are abnormal

Sea waves caused by rapid displacement of body of water.

• Tsunami can be generated by underground, Undersea earthquake, landslide, volcanic and Asteroid crash. It causes displacement of gigantic water masses, the sea bed must be lifted or lowered.

• The distance between one wave crest to next wave crest (100 and 300 km) differentiate the tsunami from normal waves.

Effects of Cyclones, Tsunami and Typhoons:

- ① Shipwrecks can be left ashore cause pollution
- ② Animals washed up to shore and died.
- ③ Crops damaged as the land gets flooded near the shore
- ④ Some people might get trapped under buildings.

- Economic declines are huge.
- In 2004, Indian ocean Earthquake causes tsunami, it was the most lethal ever to have recorded.
 - 230,000 deaths in 14 countries - Sri Lanka, India and Thailand.
 - Sunda Strait (Indonesia) 2018

C- Write a short note on Galaxy?

Galaxy is a gravitationally bound system of stars, stellar remnants, inter-stellar gas, dust and dark matter.

- **Black hole:** Any substance which interact via gravity with visible matter. Black hole has huge gravitational force. It attracts molecules inside it. Not even light can escape its grasp.

- **Milky Way:** large spiral system consisting of several hundred thousand stars one of which is the sun.

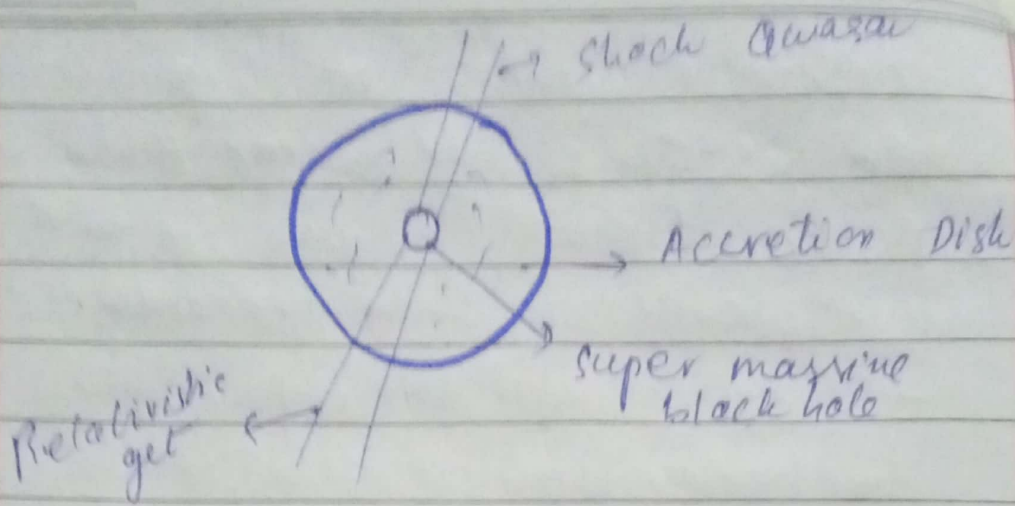


Fig: Spiral Galaxy

Supernova: A powerful and luminous explosion of a star. A star that suddenly increases greatly in brightness because of catastrophic explosion.

Nebula:

Solar system is formed out of a huge cloud of gas and dust called nebula.

Solar System

- | | |
|-------------|-----------------|
| 1 Sun | 3 Dwarf planets |
| 2 planet | 4 Satellites |
| 5 Asteroids | 6 Meteoroids |
| 7 Comets | 8 other objects |

Sun is the biggest object in

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our solar system consisting of
99% of solar mass

Planets: mercury, venus, Earth, Mars,
Jupiter, Saturn, Uranus, Neptune

Inner planets: Closest to the sun,
small, made up of rocks, terrestrial
planets, high density, weak
magnetic force.

They are mercury, venus, Earth,
Mars.

Outer planets: Far from sun, large
mass, gaseous, low density, strong
magnetic force, many moons.

They are Jupiter, Saturn, Uranus, Neptune.

Dwarf planets:

It has not cleared the neighbourhood
around its orbits e.g. Pluto, Ceres
Small sized, less gravitational pull

Satellites: They are moons. It is
a body in space that orbits
around a larger body.
Moon: the largest body in

our solar system.

Asteroids and Meteoroids:

Largest non-planetary and non-lunar objects in the solar system.

100 meter in diameter.

Its diameter is 480 km.

Meteoroids:

A small body traveling through space. originates from comets and asteroids.

Comets:

It is a celestial body that orbits around the sun. It is made up of tail of gaseous components.

Earth: It is the fifth largest planet in our solar system, biggest of all planets. only planet where life exist.

- Immanuel Kant Hypothesis
- Chamberlin Moulton hypothesis
- Big Bang theory
- steady state theories.

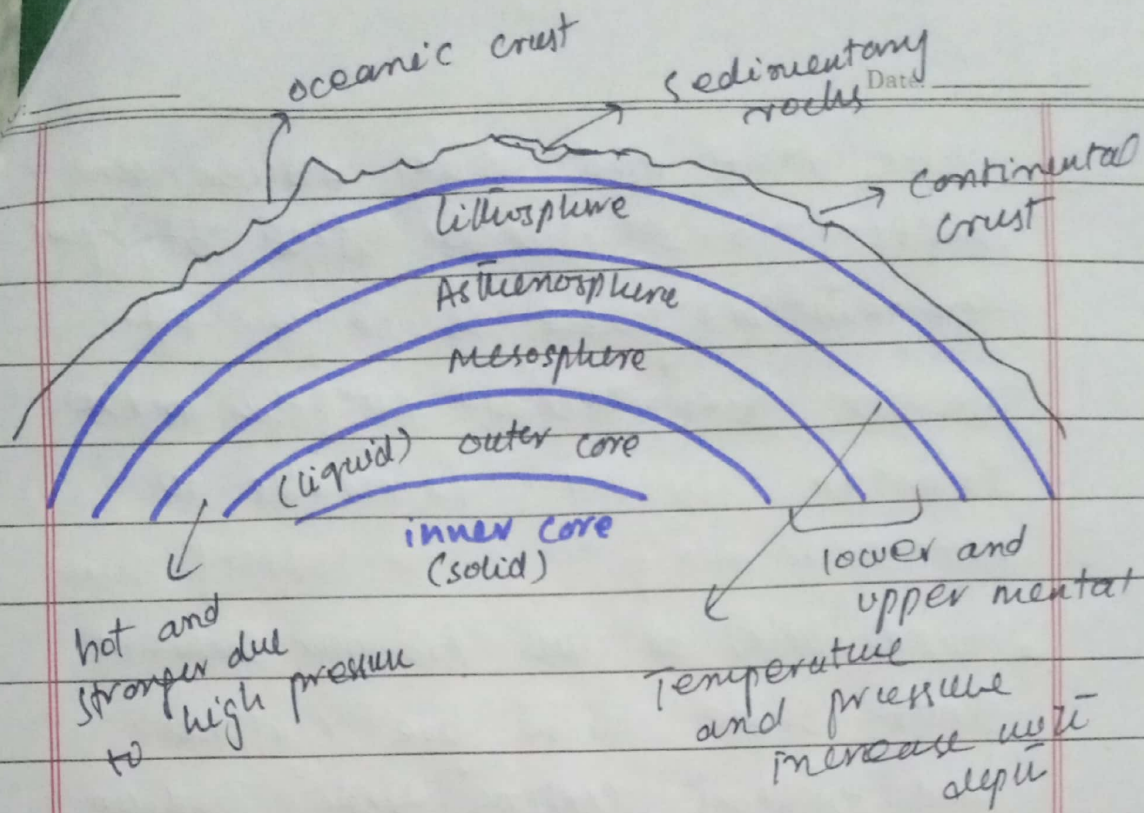


Fig: Structure of Earth

D. Explain DRM:

DRM stands for disaster Risk Management.

"Disaster Risk Management is a strategy through which disasters are managed either prior to their occurrence or after it."

- As the environment is continuously bearing transition, Pakistan is at high risk of disasters. Such as there is increase in monsoon

veins, more and more glaciers are melting and due to high atmospheric temperature there is high off season precipitation. All this makes Pakistan highly vulnerable to floods.

- Meanwhile, on the Arabian sea, in Sindh shore, there are cyclones and typhoons coming from Indian oceans.
- Earthquake is also most common in Pakistan in Balakot, Karachi, Sindh and Balochistan. FATA region is the most vulnerable of it.
- In such circumstances, the disasters are on verge, there is a need of effective management strategy.
- In 2023, in Kashmir, due to high fog many of the people died due to gaseous release from their cars as they stuck in fog.

Disaster Risk Management Strategies:

- ① National Disaster Risk Management Authority must play its part.
- ② There must be a comprehensive federal and provincial plan in this regard.
- ③ In 18th Amendment to the Constitution of Pakistan, the power of disaster management is given to provinces.
There is a need to strengthen the capability of provinces.
- ④ Rather than involving state institutions like Armed forces for disaster management, the civilian institutions should be made competent and vigilant enough to tackle disastrous situation.
- ⑤ Incorporation of Technology in DRM is the need of the hour.

- ⑥ Incorporation of satellites in disaster prone area for priority determining the intensity of floods, cyclones is also a significant step.
- ⑦ For overcoming flood in country, there is a need to build dams. There is a need of genetically modified crops. For instance, Pakistan has imported Eucalyptus from Japan. It is a plant that absorbs large amount of water and filter harmful substances from the roots of other plants to help them grow well.
- ⑧ There must be separate state machinery for disaster management. For instance, helicopters and drilling machines must be separate from the normal usage machines.
- ⑨ There must be separate hospitals for disaster prone people. Meanwhile, there must be shelter and food facilities at its disposal.

⑥ There must be some special strategies for women as they are the most vulnerable sections of society. children must also be protected from after effects of disasters such as malnutrition.
