

PART-II

Section-I

Q.2

a)

Malnutrition:

Malnutrition is a condition that occurs when the body does not get enough nutrients to function properly. It can refer to both undernutrition, which is lack of sufficient nutrients, and overnutrition, which is excess of nutrition.

Causes of Malnutrition:

- **Poverty:** Limited financial resources causes lack of access to food can leading to malnutrition.
- **Inadequate dietary intake:** A diet which lacks in essential nutrients, such as proteins, vitamins, and minerals, can lead to malnutrition.
- **Infections and diseases:** Infections and diseases can interfere with nutrient absorption which causes malnutrition.
- **Poor sanitation and hygiene:** It can increase the risk of infection

and diseases, leading towards malnutrition.

• Climate and environmental factors: These factors can affect food production and availability, contributing to malnutrition.

Consequences of Malnutrition:

- Delays in the growth of children.
- Increased risk of infections and diseases.
- Increased risk of chronic diseases, such as diabetes and heart disease.
- Impaired cognitive function
- Increased risk of mortality.

b. Difference between food Contamination and adulteration:

<u>Contamination</u>	<u>Adulteration</u>
• Addition of substances unintentionally.	• Addition of substances intentionally.
• Occurs during growing, harvesting, processing, packing, or transportation.	• Adulterants are added to food to improve its texture or appearance or disguise poor quality or spoilage.
• Includes substances like, bacteria, viruses, fungi, parasites, heavy metals and physical objects.	• For instance, water added to milk.

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| <ul style="list-style-type: none">• Can pose health risk if present in high levels.• Regulated by government agencies to ensure that levels of contaminants are within safe limits. | <ul style="list-style-type: none">• Can pose health risk if they displace essential nutrients.• Regulated by government agencies to ensure that adulterants are not used in a way that harms consumers. |
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C. Computer Buses:

- Set of parallel lines, that are used to transfer data between different components of computer, is termed as Computer buses.
- It can be referred as communication system.
- The capacity of computer buses depend on the number of DATA lines in it.
- Central processing unit (CPU) communicates with other components of computer through buses.

Internal Buses:

- Used to connect main components of a computer
- These are part of mother board
- Normally, computer have 70-100 lines.

External Buses:

- Made up of electronic pathways that connects the different external devices to the computer.

Difference Between RAM and ROM:

RAM	ROM
• Stands for Random Access Memory	• Read only Memory (Full form of ROM)
• Volatile memory	• Non-volatile memory
• Data is lost when power is off.	• Data is retained even when power is on.
• Used for temporary data storage.	• Used for permanent data storage.
• Read and write operations	• Read-only operations.
• Smaller capacity than ROM	• Larger capacity than RAM
• Faster access time than ROM	• Slower access times than RAM
• Cheaper than ROM	• More expensive than RAM
• Includes SRAM, DRAM, SDRAM	• Includes PROM, EPROM, EEPROM, Flash Memory and Mask ROM

d. Geo-stationary Satellites

Geo-stationary satellites refer to the satellites that orbit the earth at a specific altitude (about 35,786 km) and remains fixed over one longitude at equator. These satellites appear motionless at fixed position in the sky to ground observers.

Difference Between Natural and Artificial Satellites:

<u>Natural Satellites</u>	<u>Artificial Satellites</u>
<ul style="list-style-type: none"> • Objects that orbit a planet or other celestial body, naturally. 	<ul style="list-style-type: none"> • Objects that are intentionally launched into orbit around earth or other celestial body.
<ul style="list-style-type: none"> • Examples include the Moon, and asteroids that orbits the sun. 	<ul style="list-style-type: none"> • Examples include communication, weather and scientific research satellites.
<ul style="list-style-type: none"> • Formed as a result of natural process such as accretion. 	<ul style="list-style-type: none"> • Constructed by humans using various materials such as metals.

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| <ul style="list-style-type: none">• Can be observed with telescopes and other astronomical instruments. | <ul style="list-style-type: none">• Can be tracked and monitored using radar and other technologies. |
| <ul style="list-style-type: none">• Have irregular shapes and may be composed of rock, ice, and dust. | <ul style="list-style-type: none">• Have regular shapes and are designed to withstand space conditions. |
| <ul style="list-style-type: none">• Have been studied extensively by astronomers. | <ul style="list-style-type: none">• Have revolutionized modern communication, navigation and contributed in space exploration. |

Artificial Satellites of Jupiter:

There is only single man-made satellite orbiting the planet Jupiter, the space probe Juno.

Q.5
a)

Radioactivity:

Due to nuclear instability, an atom's nucleus exhibits the phenomenon of Radioactivity.

Energy is lost due to emitted radiation of unstable nucleus of an atom.

Difference Between Natural And Artificial Radioactivity

Natural Radioactivity Artificial Radioactivity

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| <ul style="list-style-type: none"> • Occurs spontaneously in nature | <ul style="list-style-type: none"> • Induced through human intervention |
| <ul style="list-style-type: none"> • Radiates from naturally occurring isotopes | <ul style="list-style-type: none"> • Radiate from induced isotopes created in a laboratory. |
| <ul style="list-style-type: none"> • Examples are radium, Uranium, Carbon-14 | <ul style="list-style-type: none"> • Examples are Cobalt-60, Iodine-131, Technetium-99m |
| <ul style="list-style-type: none"> • Have constant rate of emission. | <ul style="list-style-type: none"> • Controlled amount and type of radiation emitted |
| <ul style="list-style-type: none"> • Used for medical imaging, nuclear power. | <ul style="list-style-type: none"> • Used for cancer treatment, scientific research. |

b) Polio:

Polio, short form of poliomyelitis, is a highly contagious viral disease caused by poliovirus. It primarily affects the children and the age of 5, but it can also affect older children and adults. Polio is transmitted through the fecal-oral route, typically by contaminated

food, water, or surfaces.

Symptoms:

Initial symptoms are fever, headache, vomiting, stiffness of the neck and pain in the limbs. Later, one in 200 injections leads to irreversible paralysis, usually in legs.

Causes of Spreading:

Polio spreads through coughing or sneezing or from coming in contact with faces of an infected person. The virus is transmitted by person-to-person spread through the fecal-oral route or by common vehicle.

Prevention and Vaccine

Vaccination: It is most effective way to prevent polio. It is given as a part of routine of immunization schedules for infants and children.

- Inactivated Polio Vaccine (IPV)
- Oral Polio Vaccine (OPV).

Vaccination Campaigns: National and global campaigns provide supplementary doses of polio vaccine to maximum population and interrupt the transmission of poliovirus.

Improved sanitation and hygiene: Maintaining good sanitation practices and improved hygiene can help in preventing the spread of virus.

Surveillance and Outbreak response: Countries conduct surveillance to monitor polio cases and identify areas where the virus is circulating. Rapid response to the outbreaks can prevent the further transmission of virus.

C) Steps Involved in Solid Waste Management:



Waste generation happens everywhere: households, offices, restaurants and industrial sectors.

Step 2 → On-Site handling

On-site handling refers how the company, household, or any other source of solid waste generation stores the particular type of waste.

Step 3 → Waste Collection

During waste collection, garbage trucks come to a facility and collect the waste from garbage cans, recycling bins and skip bins.

Step 4 → Waste Transfer

After collection, waste is brought to a waste transfer station where waste is sorted and consolidated from various sources so that it can be transported to the proper facility.

Step 5 → Waste Processing And Disposal

After arriving at appropriate facility, the facility then

must process and dispose the materials. For instance, a paper waste goes to a recycling facility for processing, garbage goes to landfill and hazardous waste goes to a special facility for safe disposal and storage.

Issues of Solid Waste Management in Our Country

Solid waste management is a major issue in our country, Pakistan, with limited resources for waste management. Some main issues of solid waste management in our country include:

Lack of infrastructure: Many cities in our country lack basic waste management infrastructure, such as collection vehicles, disposal facilities and recycling centers which leads to the improper waste disposal.

Limited resources: Lack of funding and resources is a major challenge in Pakistan. Insufficient budget and trained personnel often lead to

improper wastemanagement.

Lack of public awareness: In our country, there is lack of awareness about importance of proper waste management which leads to the illegal dumping of wastes.

Lack of effective regulations: There is lack of enforcement of effective regulations in Pakistan. Many companies operate without permits and regulations are not properly imposed.

d) Population Planning

Population planning is the practice of managing the growth rate of human population.

It refers to a policy of attempting to limit the growth in numbers of population, especially in poor or densely populated parts of the world by programmes of contraception or sterilization.

Benefits:

Reduces Poverty: Slowing fertility rates are strongly linked to reduction in poverty.

Saves the lives of mothers and babies: Ill-timed pregnancies and births contribute to high maternal and infant mortality rates.

Provides opportunity for economic growth: population planning can help slow unstable population growth that threatens the economic growth.

Part II

Q.6

9)

Solution:

Percentage increase = $\frac{\text{New value} - \text{Original value}}{\text{Original value}} \times 100$

Given information:

Enrollments in Jan 2022 = 850

Enrollment in Jan 2023 = 1120

By putting these values;

$$\text{Increase percentage} = \frac{1120 - 850}{850} \times 100$$

$$= \frac{270}{850} \times 100$$

$$= 31.76\%$$

Therefore, the increase percentage for the enrollment is 31.76%.

b) Solution:

Let the age of the son be x ,
then the age of the man 2
years ago was $5x - 2$.

The sum of the squares of
their ages 2 years ago was 114

$$\Rightarrow (5x - 2)^2 + x^2 = 114$$

Expanding the equation

$$25x^2 - 20x + 4 + x^2 = 114$$

$$26x^2 - 20x - 110 = 0$$

Using quadratic equation

$$x = \frac{20 \pm \sqrt{(20)^2 + 2(26)(20)}}{2(26)}$$

$$x = \frac{20 \pm \sqrt{400 + 4400}}{52}$$

$$x = \frac{20 \pm \sqrt{4800}}{52}$$

$$x = \frac{20 \pm 69.28}{52}$$

$$x = 1.72 \text{ years.}$$

Hence, the age of the son
is approximately 1.72 years.

c) Solution:

Each head will have at least
two legs.

$$\Rightarrow 48 \times 2 = 96 \text{ legs.}$$

$$\text{Remaining legs} = 140 - 96 = 44$$

which must belong to quadrupeds

$$\Rightarrow 44/2 = 22 \text{ Cows \& 26 hens}$$

Therefore, number of hens is 26.

d) Solution:

let a = average speed for the trip

let d = half of the distance.

As we know that;

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

so for the first half, $\text{time} = \frac{d}{40}$

and for the 2nd half, $\text{time} = \frac{d}{60}$

$$\text{Total distance} = \frac{2d}{a}$$

$$\text{Hence, } \frac{d}{40} + \frac{d}{60} = \frac{2d}{a}$$

$$\text{or } \frac{1}{40} + \frac{1}{60} = \frac{2}{a}$$

$$\frac{3+2}{120} = \frac{2}{a}$$

$$5/120 = 2/a$$

$$5a = 240$$

$$a = \frac{240}{5}$$

$$a = 48 \text{ km/h}$$

Therefore, the average speed of the car is 48 km/h.

Q.7

a) Solution:

Let the number be x .

According to the condition given in statement;

$$\frac{x}{6} + 50 = 60$$

$$\frac{x}{6} = 10$$

$$x = 60$$

Hence the number is 60.

b) Solution:

The given sequence is

0, 16, 24, 34, 40, 48

The logic is

$$8 \times 1 = 8$$

$$8 \times 2 = 16$$

$$8 \times 3 = 24$$

$$8 \times 4 = 32$$

$$8 \times 5 = 40$$

$$8 \times 6 = 48$$

But in the given sequence 32 is replaced by 34. Therefore the odd one is 32.

c) Solution:

Height of the tower is perpendicular of right angle triangle $\Rightarrow P = 15\text{ m}$

The base from the tower
 $B = 20\text{ m}$

The aerial distance is the hypotenuse of right angle triangle. Let h is the hypotenuse

$$h^2 = P^2 + B^2$$

$$h^2 = 15^2 + 20^2$$

$$h^2 = 225 + 400$$

$$h^2 = 625$$

$$h = 25\text{ m.}$$

Hence the aerial distance is 25 meters.