

Part II Section - 1

Q: 2

a Define the term malnutrition?
elaborate its major causes and
Consequences?

Ans

Malnutrition:

Malnutrition occurs when an organism gets too few or too many nutrients, resulting in health problems - specifically, it is a deficiency, excess or imbalance of energy, protein and other nutrients.

Major Causes:

- Poverty
- Food Insecurity
- Inadequate dietary intake
- Diseases
- Medical Conditions
- Social factors
- Cultural factors
- Environmental factors

Poverty :

poverty often means limited access to diverse and healthy food.

Causes	Accidental, during production, processing, storage or handling	Deliberate for profit or deception
Nature	unintentional	Intentional
Examples	Bacteria in meat, pesticide in vegetables	Water in milk, chalk powder in flour
Impact on health	food borne illness	long term health issues or toxicity
Detection	often require lab testing	can be detected by appearance or taste

c What are computer buses?

Differentiate RAM and ROM?

Ans

Computer buses:

A computer bus is a set of electrical pathways used for communication between different parts of a computer system such as CPU, memory and input/output

devices.

Function: Buses carry data, addresses, and control signals.

Types:

Data bus

Address bus

Control bus

System bus

Internal bus

External bus

Differentiate between RAM and ROM:

RAM	ROM
• Random memory access • Temporary memory that store data • Currently in use • Volatile: data is lost when power is off • Read and write operations are allowed	• Read only memory • permanent that stores firmware or system data • Non-volatile data remain even without power • Mostly read only writing is limited or not allowed

• Faster	Slower compared to RAM
• Used to store programs and data CPU is currently using	Stores firmware like BIOS or bootloader.
• Data can be changed.	— Data is written once and rarely changed.
• DRAM, SRAM	PROM, EPROM, EEPROM

d What are geo-stationary satellites?

Distinguish natural and artificial satellites, how many artificial

Satellites of jupiter are there?

Ans

Geo-stationary Satellites:

It is a satellite that orbits the earth directly above the equator at a fixed position relative to earth surface.

Distinguish natural and artificial satellite :

Natural satellite	Artificial satellite
• A celestial body that naturally orbits a planet. - • The moon (earth's natural satellite) • Formed by natural cosmic process • Follow natural orbital paths due to gravity • can last billions of years.	• A man made object placed in orbit around body in space. • Hubble space, Telescope, GPS. • Built and launched by humans • controlled and adjusted using onboard system • limited by fuel, mission duration

Artificial Satellites of Jupiter:

- Galileo (orbited Jupiter from 1995 to 2003)
- Juno (currently orbiting Jupiter since 2016)
- Voyager 1 and 2
- Pioneer 10 and 11
- New Horizons (flybys)

Q: 4 a Differentiate between temperature and tropical cyclones?

Ans	Feature	Temperature	Tropical cyclones
	Region	Mild-latitudes 30° to 60°	Tropical regions 5° to 20°
	Cause	Interaction of warm and cold air masses	Warm ocean water and low pressure
	Core	Cold	Warm core
	Temperature	Core system	System
	Structure	Frontal system with distinct warm and cold fronts	No fronts, Circular Symmetric Structure
	Energy	Temperature	Latent heat
	Source	Constant between air masses	from warm ocean water
	Season	Can occur year round	Mostly in warm seasons (summer/fall)
	Direction	West to east	East to West
	Examples	Mid latitude storms	Hurricanes, cyclones, typhoons

b Differentiate star and planet... How
star become a black hole?

Ans **Star:**

A luminous celestial body that generates its own light and heat through nuclear fusion

Light emission:

Emits its own light and heat.

Temperature:

Extremely hot (thousands to million of $^{\circ}\text{C}$)

Size:

Much larger than planets.

Position:

Centre of solar system.

Examples:

Sun, Alpha Centauri.

Planet:

A non-luminous celestial body that orbit a star.

Light emission:

Reflects the light of a star.
(does not emit its own light)

Temperature

Much Cooler compared to stars

Size :

Smaller than stars

Position :

Orbits around a star

Examples:

Earth, Jupiter, Mars

Star become black hole:

A black hole begins forming when a massive star exhausts its nuclear fuel and can no longer support itself against gravity.

- Star runs out of fuel.
- Core collapse
- Supernova explosion
- Black hole forms

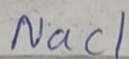
C Why do atoms form chemical bonds? Explain structure of water?

ms Atoms form chemical bonds

to achieve greater stability, typically by reaching a full outer electron shell.

Main types of chemical bond:

Ionic bond. When electrons are transferred from one atom to another e.g.



Covalent bonds: When atom shares electrons e.g. water

Metallic bonds:

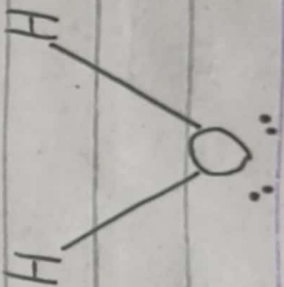
When electrons are shared among many atoms in a sea of electrons.

Structure of water:

Water is a simple molecule

consisting of one oxygen bonded to two different

hydrogen atoms. Because of higher electronegativity of oxygen atom. The bonds are polar covalent.



Q What are conductors, semiconductors, metals, plastics and ceramics?

Give an example of each

Ans **Conductors:**

Conductors are materials that allow electric current (the flow of electrons) to pass through them easily. This is because they have free electrons.

Examples:

- Copper: wire for electricity
- Aluminium
- Gold
- Silver
- Iron

Semi-conductor:

Materials that have electrical conductivity between that of

Conductors like metals (and
insulators like glass)

Examples:

- Silicon
- Germanium
- Gallium arsenide

Metals:

Elements that are typically
shiny, good conductors of
heat and electricity, malleable
(can be hammered into sheets)
and ductile (can be drawn
into wires).

Examples:

- Copper
- Iron
- Gold etc

Plastics:

plastics are synthetic or
semi-synthetic polymers
that can be molded
or shaped, often using
heat and pressure.

Examples:

- polypropylene
- polystyrene

Ceramics:

Ceramics are inorganic non-metallic materials formed by shaping and firing at high temperatures.

Example:

Glass

bricks

Cement

Pottery

Section II

Q6 a The sum of three consecutive prime numbers is 159, find the numbers?

Ans Let the three consecutive prime number be

P_1, P_2, P_3

Given

$$P_1 + P_2 + P_3 = 159$$

$$47 + 53 + 59 = 159$$

So prime numbers are
47, 53 and 59.

b The perimeter of a circle having
a radius 6cm is equal to?

Ans The perimeter of a circle is
same as its circumference

$$\text{Circumference} = 2\pi r$$

for radius $r = 6\text{cm}$

$$\text{Circumference} = 2 \times \pi \times 6 = 12\pi$$

$$12\pi \approx 37.70 \text{ cm}$$

So, Approx 37.70 cm

c Find the percentage of a man when
then average age of the man,
wife and their child 3 years
ago was 27 and that of
wife and child 5 years ago
was 20 years?

Ans present age of man = M

present age of wife = W

present age of child = C

The average age of man, wife and child 3 years ago is 27.

So, their total ages 3 years ago

$$(M-3) + (W-3) + (C-3) = 3 \times 27 = 81$$

Simplify:

$$M + W + C - 9 = 81 \Rightarrow$$

$$M + W + C = 90 \rightarrow \text{eq (1)}$$

Their ages of wife and child 5 years ago was 20.

So, total their ages

$$(W-5) + (C-5) = 2 \times 20 = 40$$

Simplify:

$$W + C - 10 = 40 \Rightarrow$$

$$W + C = 50 \rightarrow \text{eq (2)}$$

Subtract

Eg $\rightarrow$ eq (2) from eq (1)

$$M + W + C = 90$$

$$W + C = 50$$

$$M = 90 - 50 = 40$$

The present age of man is 40

d Solution:

The 1st no is x

The 2nd no is y

The 3rd no is z

Ratio of first to second
is $2:3$

$$\frac{x}{y} = \frac{2}{3} \Rightarrow x = \frac{2}{3} y \text{ --- eq (1)}$$

Ratio Second to third
 $5:8$

$$\frac{y}{z} = \frac{5}{8} \Rightarrow z = \frac{8}{5} y \rightarrow \text{eq (2)}$$

Sum of three numbers : 98

$$x + y + z = 98$$

Substitute $x = \frac{2}{3} y$ and

$$z = \frac{8}{5} y$$

$$\frac{2}{3} y + y + \frac{8}{5} y = 98$$

So

$$\frac{2}{3} y = \frac{10}{15} y, y = \frac{15}{15} y$$

$$\frac{8}{5} y = \frac{24}{15} y$$

Now

$$\frac{10}{15}y + \frac{15}{15}y + \frac{24}{15}y = 98$$

$$\frac{49}{15}y = 98$$

Solve y

$$49y = 98 \times 15$$

$$49y = 1470$$

49 divide both sides.

$$y = \frac{1470}{49} = 30$$

Second no = 30

7 (a) Solution:

Let two numbers be x and y

$$x + y = 23 \quad \text{--- eq ①}$$

$$xy = 132 \quad \text{--- eq ②}$$

So,

$$t^2 - (x+y)t + xy = 0$$

$$t^2 - 23t + 132 = 0$$

$$t = \frac{-(-23) \pm \sqrt{(-23)^2 - 4(1)(132)}}{2(1)}$$

$$t = \frac{23 \pm \sqrt{529 - 528}}{2}$$

$$t = \frac{23 \pm \sqrt{1}}{2}$$

So,

$$t = \frac{23 + 1}{2} = 12$$

$$\text{and } t = \frac{23 - 1}{2} = 11$$

The two numbers are 12
and 11

b Solution:

let the number be x

$$40\% \text{ of } x = 20\% \text{ of } 650 + 190$$

Calculate 20% of 650

$$20\% \text{ of } 650 = \frac{20}{100} \times 650 =$$

130

$$0.40x = 130 + 190$$

$$0.4x = 320$$

Solve x

$$x = \frac{320}{0.4} = 800$$

$$x = 800$$

C

Solution :

Let the marked price of car be M .

After 20% discount, the price is 70 million

$$\begin{aligned}\text{Selling price} &= M - 20\% \text{ of } M \\ &= 70 \text{ million}\end{aligned}$$

$$\begin{aligned}M - 0.20M &= 70 \Rightarrow \\ 0.80M &= 70\end{aligned}$$

Solve M ,

$$M = \frac{70}{0.80} = 87.5 \text{ million}$$

Marked price of car is 87.5 million

d Solution:

Let the number be x
first increase the number
by 10% : $x + 0.10x$
 $= 1.10x$

The decrease the new number
by 10% : $= 1.10x - 0.10$
 $(1.10x) = 1.10x \times 0.90 =$
 $0.99x$

Net change $= 0.99x - x =$
 $-0.01x$

So

Net change is 1%
