Date: Day: Date:

(Distinguish Byte & Nibble)

No question number
No answer number
This is not the format of a paper.

Aspect	Byte	Nibble
Definitions	A byte is a unit of digital information that consists of 8 bits	A nibble a unit of digital information that consists of 4 bits.
Representation of Bits	Consists of 8 binary digits (bits)	consists of 4 binary digits (bits)
Relation	A byte is composed of two nibbles. Each nibble represents half of the byte	Four nibbles make up a byte.

Follow paper format
Use markers
Write in paragraphs form
Make more headings
Work on math portion

(GPS & GIS)

Aspect	GPS (Global-Positiony-Systar)	GIS (Geographic information system)
Definition	GPS is a satellite-based navigation system that provides precise location information using network of satellite	GIS is a system design to capture, stores, analyse, manages & present spatial or geographic data

Date: Day:

Aspect	GPS	GIS
Purpose	GPS is primarily used for determining accurate position & navigation in real-time.	GPS is used for managing, analyzing data to understand patterns, relationships to make decisions.

Natural & Artificial Satellite

Aspect	Natural Satellite	Artificial Satellite
Definition:	A celestial object that orbits around a planet or another celestial body naturally occurring in space	A human-made object intentionally placed into orbit around a celestial body.
Examples	Moon (orbiting around Earth) Phobos & Deimos (around Mars)	International Space Station (ISS) Hubble Space Telescope (HTS) GPS satellites.
control.	Governed by natural processes	controlled by ground based operations.

(b) Optical fibers.

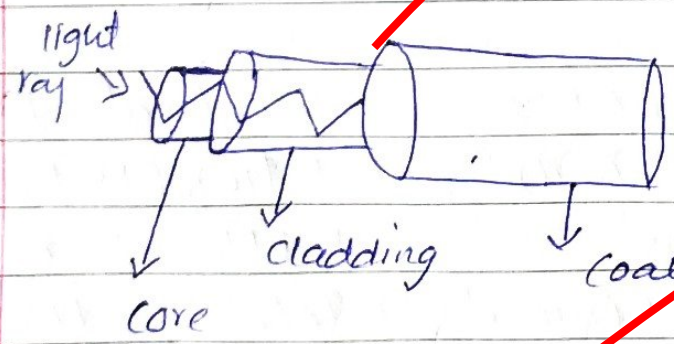
1) Definition:

Optical fibers are thin, flexible strands of transparent material, typically made of glass or plastic, that are used to transmit light signals over a long distances.

2) Structure:

An optical fiber consists of a core, which is the central region through which light travels, surrounded by a cladding layer with a lower refractive index to facilitate light confinement. Surrounded by a cladding layer along with an outermost layer is typically a protective coating.

Diagram of Optical fiber



3) Bandwidth & Speed:

Optical fibers offer a high bandwidth and send data at extremly high speed.

Date: Day:

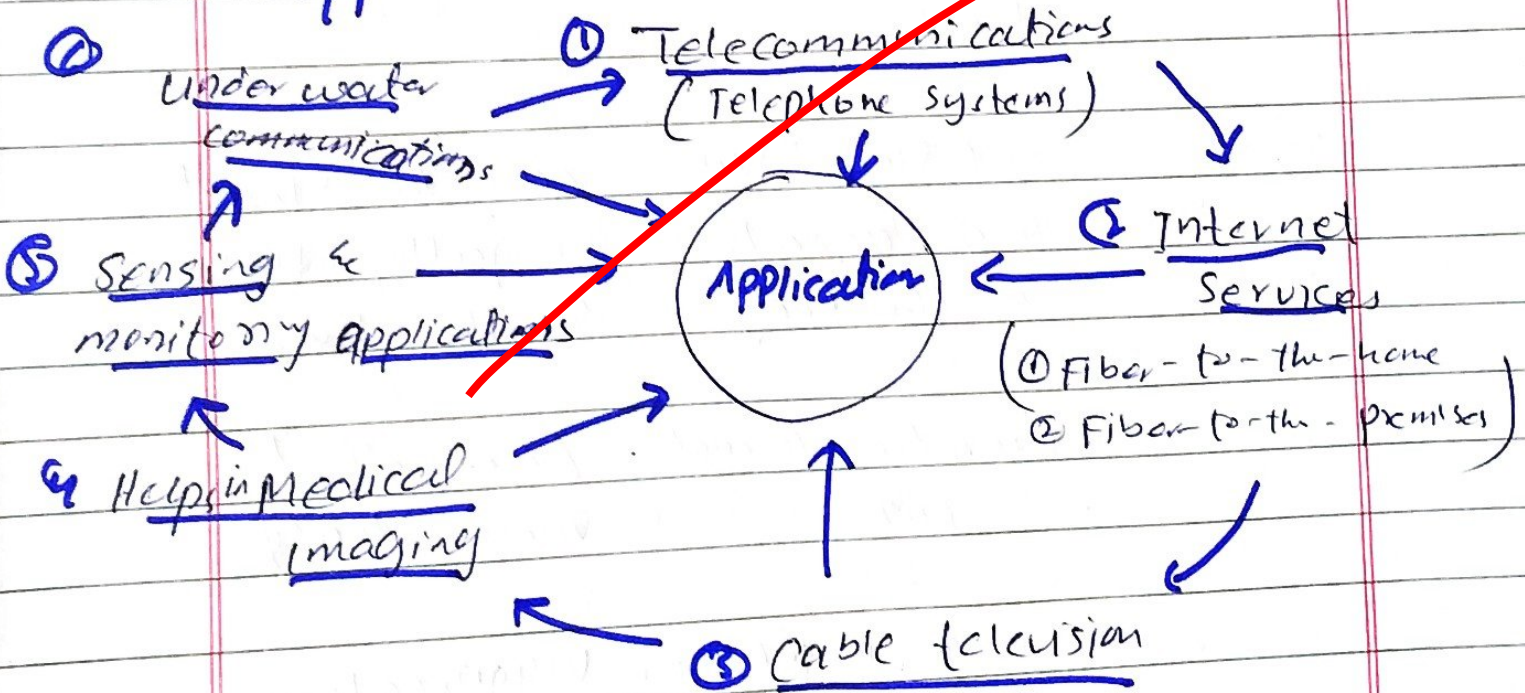
Immunity to electromagnetic interference

Unlike copper cables, optical fibers are immune to electromagnetic interference (EMI) caused by nearby electrical equipment, radio waves, or other sources.

Security & protection:

Optical fibers provide a high level of security & protection for data transmission.

Applications:



(C) Vitamins -

Distinguish water & fat Soluble vitamins

Aspect	water Soluble	fat soluble
Solubility	Dissolve in water	Dissolve in fat
Absorption	Absorbed directly into bloodstream from the digestive tract	Require dietary for absorption
Storage	Not stored in large amounts in the body	can be stored in fatty tissues & the liver.
Excretion	Excreted through urine	Eliminated more slowly.
Functions	Energy metabolism, enzyme functioning, cell growth.	vision, calcium absorption, anti-oxidant activity blood clotting
Examples	Vitamin- C, B1, B2, B3, B6, B12	vitamin: A, D, E, K

Date:

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① Vitamins

Vitamin A

Brief account (Fat soluble)

- It is important for vision, immune functions, and cell growth.

Source: It is found in animal products, liver, dairy, & eggs, as well as in fruits.

Vitamin D

- It helps in calcium absorption and bone health. The best source

Source: is Sun-light. Ricket may caused v-d absorption

Vitamin E

It functions as anti-oxidants. protecting cell from damages.

Source: Seeds & leafy greens.

Vitamin K

It is essential for blood clotting & bone health.

Source.

It is found in leafy greens & vegetables etc.

② Vitamins

Brief account (water-soluble

Vitamin C

It is known as ascorbic acid. It is crucial for collagen synthesis immune function etc.

Source: Fruits & vegetables such as oranges, strawberries etc.

B-Complex

It includes, B1, B2, B3, B5, B7, B9 & B12, having different names & composition. They help in energy production metabolism, nerve functions, & blood cell form

Sources whole grains, legumes, nuts & seeds are the best sources

Date: Day:

2- Reabsorption in tubules

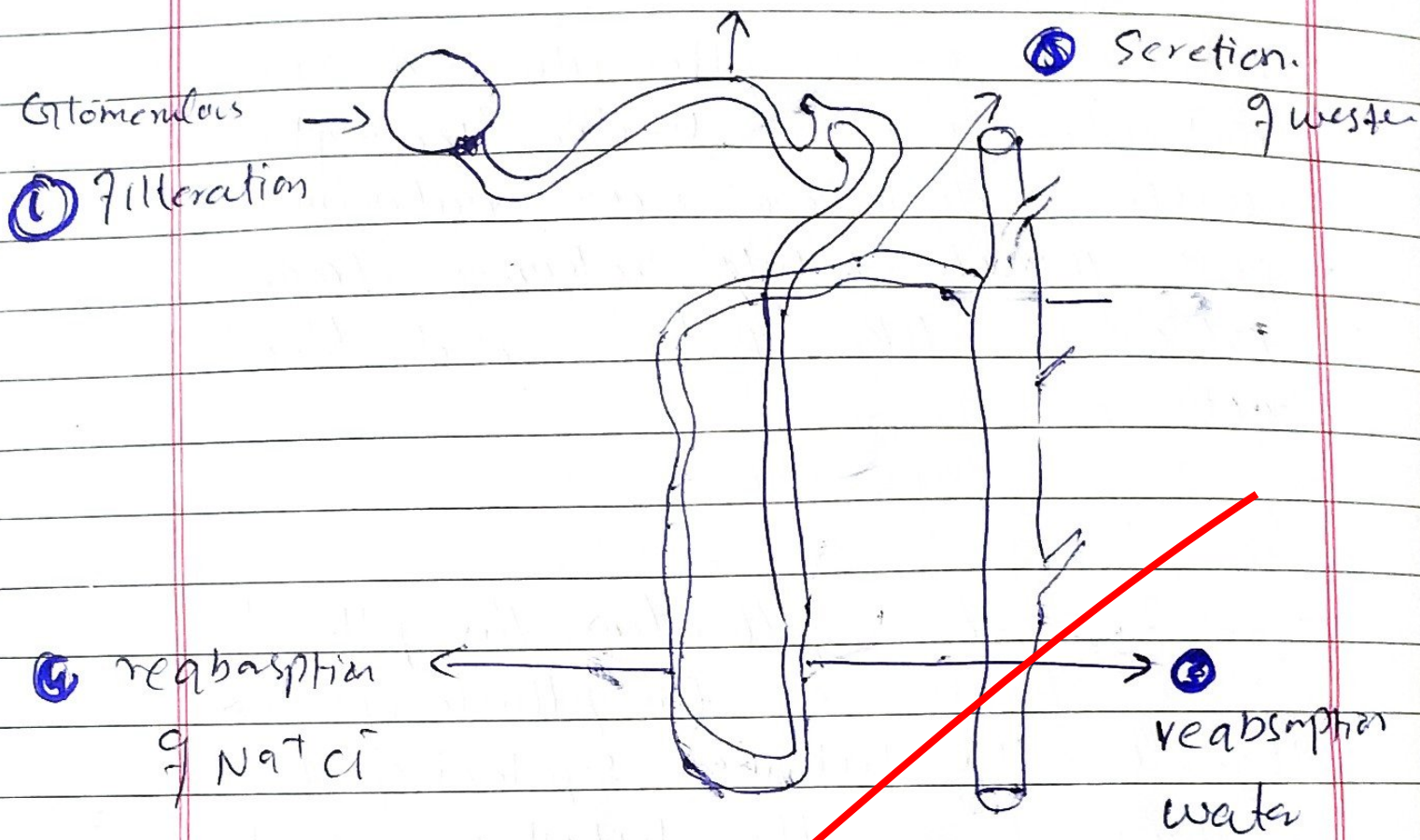


Diagram: Nephron

- Kidneys also help in hormone productions, to maintain acid-base balance inside the body & finally help in urine formation.

Part - II

Q NO: 2

Distinguishing RAM & ROM

Aspect	RAM	ROM
Stands for	Random Access Memory	Read only memory
Volatility	Volatile: Most of the times data is lost when power is removed.	Non-Volatile: It is safer than RAM. Data remains protected when power is removed.
Data-Retention	Temporary storage for active data and instructions	Permanent storage for pre-recorded instructions or data.

Distinguish Network & Internet

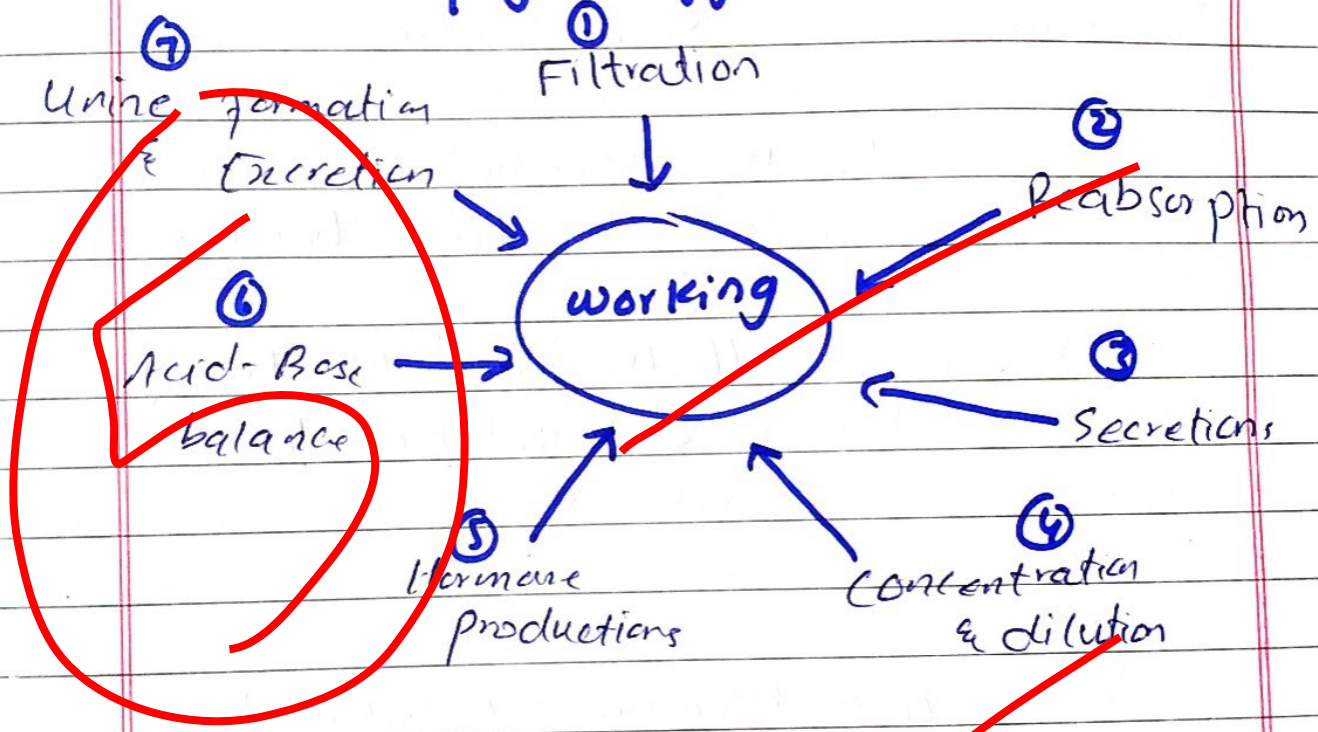
Aspect	Internet	Network
Definition	Global network of interconnected networks.	Collection of interconnected devices.
connectivity	connects millions of networks, devices and users globally	Connects devices within a specific area.
Examples	websites, Servers & devices	Local area Network connects computers & devic

(d) working of Kidney in human physiology.

① Introduction:

The Kidney's are vital organs in human physiology responsible for various important functions.

② Working of Kidney in human physiology:



Over-view of functions / working of Kidney in the body:

a) Filtration:

The kidneys receive a constant blood supply through renal artries. Inside the kidneys, blood enters a structure called nephron, which is the functional unit of the kidneys.

Nephron consists of a glamerulus

and a tubular system.

Function of glomerulus:

It acts as a filter, allowing small molecules such as water, electrolytes, waste products, and some nutrients to pass through while retaining larger molecules like protein and blood cells.

b) Reabsorption:

After filtration, the filtered fluid, known as the filtrate, passes through the tubular system of the nephron. Along the tubules, essential substances like water, glucose, amino acids, and electrolytes are reabsorbed back into blood-stream.

c) Secretion:

In addition to reabsorption, the tubular system also facilitates the secretion of certain substances.

(d) Concentration & Dilution:

Kidneys play a crucial role in maintaining fluid & electrolyte balance in the body. They regulate the concentration of solutes and the volume of water in the filtrate, which determines the concentration or dilution of urine produced.

Date: Day:

Section B

(a)

Solution:

Formula:

We can use the formula for calculating the depreciation of an asset over time and that is

$$\text{Present value} = \text{Initial value} \times (1 - \text{Depreciation Rate})^{\text{no. of years}}$$

$$\text{Present Value} = \text{Initial value} \times (1 - 0.10)^{13}$$

$$RS\,8748 = \text{Initial value} \times (0.90)^{13}$$

- To solve for initial value, rearrange the equation

$$\text{Initial Value} = RS\,8748 / (0.90)^{13}$$

Calculation the expression:

$$\text{Initial value} = RS\,8748 / 0.729$$

$$\text{Initial value} = RS\,12005.51$$

Solved: **Initial value ≈ RS 12005.51**

(c) Diameter of football

Solution:

$$\text{Volume} = (4/3) \times \pi \times (\text{radius})^3$$

Radius of football:

half of the diameter

$$\text{radius} = \frac{12\ \text{cm}}{2} = 6\ \text{cm}.$$

Now can substitute the radius into the volume formula:

$$\text{Volume} = (4/3) \times \pi \times (6)^3$$

$$\text{Volume} = (4/3) \times 3.14 \times (216\ \text{cm}^3)$$

Result $\boxed{\text{Volume} = 904.32\ \text{cm}^3}$

Statement:

The volume of the football would be 904.32 cubic centimeter.

Date: Day:

(d) Perimeter of the pentagon building:

Solutions:

A regular pentagon has all sides equal.

Given that each side of the building is 281m.

Formula:

Perimeter of the building = Length of one side × Number of Side,

= 281m × 5

= 1405m

Therefore, the perimeter of the building is 1405m.

Q NO: 7

(9) Largest number:

Solution:

Let 's assume the first number in the sequence is "x".

20- consective numbers

equation:

$(x+(x+1)+(x+2)+(x+3)+(x+4)+(x+5)+(x+6))/7 = 20$

Simplify equation.

$\frac{7x+21}{7} = 20$

multiplying both sides by 7:

$7x + 21 = 140$

$7x = 140 - 21$

$7x = 119$

$x = \frac{119}{7}$

$x = 17$

First number in the sequence is 17

For getting the largest add 6

Largest number = 17+6 = 23