

SECTION-I

Q no 2:

(a) "Artificial Intelligence is the new electricity". Justify with your opinion.

Artificial Intelligence is the new electricity

Artificial Intelligence : The new electricity
It is often described as the new electricity due to its transformative potential across various sectors.

Here is some key points to justify this :

→ Ubiquity and Integration:

Like electricity, AI is also becoming widespread in various industries. From healthcare and finance to education & transportation, AI's applications are extensive and growing, impacting everyday activities and business operations.

→ Productivity and Efficiency

Electricity revolutionized productivity by powering machines and devices that

automate tasks. Similarly, AI improves efficiency by automating complex processes, analyzing large datasets, and providing insights that improve decision-making and operational efficiency.

→ Innovation and New Opportunities

The occurrence of electricity led to the creation of new technologies and industries, such as telecommunication and

electronics. AI is driving innovation in fields like autonomous vehicles, smart homes, and personalized medicine, creating new economic opportunities and transforming existing business models.

→ Economic Growth and Job Creation

While there are concerns about job displacement, AI, like electricity, is expected to create new job categories and opportunities in development, maintenance, and oversight. It contributes

to overall economic growth by enhancing productivity and fostering innovation.

Date: _____

Day: _____

In short, AI's transformative impact, similar to that of electricity, lies in its ability to integrate into diverse sectors, drive efficiency and innovation, and prompt economic growth.

(b)

(b) CPU is the Brain of Computer, how it resembles with human brain is working?

The CPU of the computer and the human brain both work as the central control units of their respective systems, performing tasks that are essential for overall functioning.

Here are several ways in which the CPU resembles the human brain in its working:

→ Processing and Decision-Making:

CPU executes instructions and processes data. It interprets program instructions and performs different operations.

specified by instructions.

Human brain processes information from sensory inputs and make decisions. It interprets signals from environment and control body functions.

→ **Memory Management:**

CPU uses cache, RAM, and storage to manage data and instructions. Cache holds data for quick retrieval, while RAM store data temporarily during active tasks.

Human Brain uses short-term memory and long-term memory. Short-term memory holds information temporarily while long-term memory holds information for extended period.

→ **Energy Consumption:**

CPU requires power to operate and generates heat as a byproduct, necessitating cooling mechanisms.

Human Brain consumes energy in form of glucose and oxygen

and generate heat, regulated by the body's cooling systems.

While the CPU and human brain operate

in vastly different contexts and scales,

their functional similarities in

processing, memory management,

and energy consumption highlighting

the parallel between these two

central control units. Both are

essential for the operation of their

respective systems; managing

complex tasks and adapting to new

challenges.

Date: _____

Day: _____

(c) What do you mean by a balanced diet? Deficiency of vitamins A, B and C can result into what type of imbalances in human body?

Balanced Diet:

“Let thy food be thy medicine”:
Hippocrates

A balanced diet is a diet in which includes right amount of all the nutrients such as proteins, vitamins, minerals, fats, carbohydrates, etc.

For proper growth, development and functioning of the body.

A balanced diet is requisite for the growth and development of the person, especially the children.

It has direct relation with the health of a person.

Deficiency of Vitamins A, B & C:

→ Deficiency of Vitamin A:

Date: | Imbalances: (Vitamin A deficiency)

- Night Blindness and an increased risk of xerophthalmia, which can lead to a complete blindness.
 - Weakened Immune response
 - Dry and scaly skin
- Vitamin B Deficiency Imbalances:

- B1 (Thiamine): Beriberi, which affects the cardiovascular and nervous systems.
- B2 (Riboflavin): causing sore throat, redness and swelling of the mouth and throat and cracked lips.
- B3 (Niacin): Pellagra, diarrhea, and dementia.
- B12 (Cobalamin): Pernicious Anemia, leading to Fatigue, weakness, constipation, loss of appetite, and neurological issues.

→ Vitamin C Deficiency Imbalances:

- Scurvy: Symptoms like fatigue, Swollen gums, joint pain and anemia.

- Wound Healing
 - Immune Functions : Lowered
immune defense,
making the body
more prone to
infections.
-

- (d) Discuss Working of Optical Fibers. What is GPS? How 2D and 3D Locations are measured by Satellites?

Working of Optical Fibers:

Optical Fibers are thin strands of glass or plastic that are used to transmit light signals over long distances. The key principle behind their operation is total internal reflection.

Here how they work:

1. Core and Cladding:

An optical fiber consists of a core surrounded by a cladding layer. The core has a higher refractive index than the cladding.

2. Light Transmission:

When light enters the core at a certain angle, it is reflected off the core-cladding boundary and continues to travel down the fiber.

3. Signal Integrity:

The light signals can carry data over long distances with minimal loss and interference, making optical fibers ideal for telecommunications and networking.

GPS (Global Positioning System)

It is a satellite-based navigation system that allows a GPS receiver to determine its exact location (longitude, latitude and altitude) anywhere on earth. It consists of a network of satellites that continuously transmit time-stamped signals.

→ 2D Location Measurement

To determine a 2D location (latitude and longitude), a GPS receiver needs signals from at least three satellites, to reach it.

In this process involves

- Triangulation
- Intersection

Date: _____

Day: _____

→ 3D Location Measurement

For a 3D location (latitude, longitude and altitude), signals from at least four satellites are required.

This process involves

- Triangulation Plus One
- Spheres Intersection

In both cases, the accuracy of the location depends on factors such as the no. of visible satellites, atmospheric conditions, and the quality of the GPS receiver.

These technologies - Optical fiber and GPS - play a crucial role in modern communication and navigation systems, enhancing connectivity and location based services globally.

Q no 4

Day: _____

(a) Write a note on Liver juice
"Bile".

"Bile :

The Liver's Digestive Secretion"

Bile often refers to as liver juice, is a vital digestive fluid produced by the liver. It plays a crucial role in the digestion and absorption of fats and fat-soluble vitamins in the small intestine.

Production and Storage The liver continuously produces bile, which is composed of bile salts, cholesterol, bilirubin, electrolytes and water.

Storage in Gallbladder Although bile is produced by the liver, it is stored and concentrated in the gallbladder. When food, particularly fatty food, enters the small intestine, the gallbladder releases bile into the duodenum through the bile duct.

Composition of Bile:

Day: _____

Bile composed of: Bile salts, Bilirubin, Cholesterol, Electrolytes and water

- Bile salt: most critical components derived from cholesterol. Bile salts aid in the emulsification of fats, breaking them down into smaller droplets, which enhances the action of digestive enzymes.
- Bilirubin: A waste product formed from the breakdown of hemoglobin in red blood cells. Bilirubin gives bile its characteristic yellow-green colour.
- Cholesterol: Excess cholesterol is excreted in Bile.
- Electrolytes and water: It helps to maintain the fluid balance and consistency of bile.

Functions of Bile :

- Emulsification of Fats : Bile salts break down large fat globules into smaller droplets, increasing the surface area for pancreatic lipase to act upon. This process is essential for the efficient digestion and absorption of dietary fats.
- Absorption of Fat-soluble Vitamins : Bile facilitates the absorption of vitamins A, D, E and K, which are soluble in fats.
- Waste Excretion : Bile serves as a medium for the excretion of waste products such as bilirubin and excess cholesterol.
- Antimicrobial Action : Bile has antimicrobial properties that help to control the growth of bacteria in the small intestine.

Bile is an essential digestive fluid produced by the liver, crucial for the digestion and absorption of fats and

Date: _____

Day: _____

and fat-soluble vitamins.

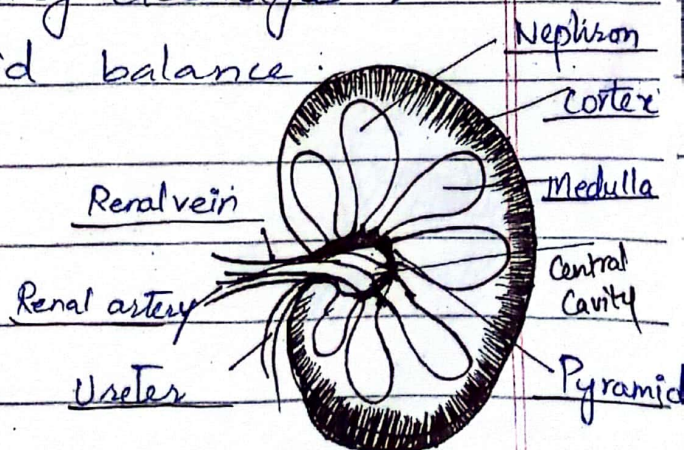
(b)

Describe role of Kidney in excretion.

Kidney :

The Kidney are dark-red, slightly flattened, bean shaped organs about 10cm long, 5cm wide and 4cm thick and each weighing about 270g.

The Kidney is a vital organ in the human body, playing a crucial role in maintaining overall health and homeostasis. It is part of urinary system and is responsible for filtering blood, removing waste products, balancing electrolytes, and regulating fluid balance.



Role of Kidney in Excretion:

Formation of Urine:

- The final product, urine, consists of water, metabolic waste products (such as urea, creatinine, and uric acid), and excess ions.
- Urine is collected in the renal pelvis and then transported to the bladder through the ureters.
- The bladder stores urine until it is excreted from the body through the urethra during urination.

The kidneys are essential for excretion of metabolic waste products, regulation of fluid and electrolyte balance, and maintenance of overall homeostasis.

Day:

(C) Discuss different methods of Solid Waste Management.

Solid Waste Management:

It is the process of collecting, treating, and disposing of solid material that are discarded as useless and unwanted.

It is essential for maintaining public health, protecting the environment and conserving resources.

Various methods are employed to manage solid waste effectively.

1. Landfilling:

It involves the disposal of waste in designated land areas. Waste is compacted and covered with soil, to minimize environmental impact.

It is simple and cost effective.

It requires significant land space.

2. Incineration:

It involves the combustion of waste at high temperature, reducing its volume and converting it into

ash, flue gas and heat.

3. Recycling:

Recycling involves converting waste materials into new products, reducing the need for raw materials.

It conserves natural resources.

It also reduces energy consumption.

4. Composting:

It is the biological decomposition of organic waste (such as food scraps and yard waste) into nutrient-rich compost.

It reduces organic waste in landfills, but it requires space and time for decomposition.

5. Anaerobic Digestion:

Anaerobic Digestion is the microbial breakdown of organic waste in the absence of oxygen, producing biogas (methane) and digestate.

It ~~can~~ ~~re~~ generates renewable energy (biogas).

6. Waste-to-Energy (WTE):

It processes and converts waste materials into energy, typically through incineration, gasification or pyrolysis. It reduces waste volume and landfill use.

7. Source Reduction and Reuse:

It ^{involves} minimizing waste generation through efficient design, manufacturing, and use of products. Reuse involves using products or materials again for the same or different purposes.

8. Vermicomposting:

Vermicomposting uses earthworms to decompose organic waste, producing nutrient-rich vermicomposting.

It produces high-quality compost.

By integrating various approaches, communities can reduce environmental impact, conserve resources and

promote sustainable waste management.

(d) Define the terms:

i) **Anemia:**

It is a medical condition characterized by a deficiency in the number or quality of red blood cells (RBCs) or hemoglobin, which is the protein in RBCs responsible for transporting oxygen from the lungs to the rest of the body. This deficiency leads to reduced energy delivered to tissues and organs, causing various symptoms and potential health complications.

ii) **Appendicitis:**

It is a medical condition characterized by inflammation of the appendix, a small-tube-shaped pouch attached to the large intestine.

It is considered a medical emergency because an inflamed appendix

Date: _____

Day: _____

can rupture, leading to serious complications such as infection and peritonitis.

iii) Spleen:

The spleen is an organ located in the upper left part of the abdomen, just under the rib cage.

It is part of the lymphatic system and plays multiple roles in the body's defense and immune response.

iv) Myopia:

It is also known as nearsightedness, is a common refractive error of the eye where distant objects appear blurry while close objects can be seen clearly. It occurs when the eye's shape cause light rays to bend (refract) incorrectly, focusing images in front of the retina rather than directly on it.

v) Isotones:

Isotones are nuclides (nuclei of atom) that have the same number of neutrons but different numbers of protons. This results in different chemical elements with nuclei that have the same neutron count.

Date: _____

Section - II

Day: _____

Q no 6:

(a)

Solve:

lets denote the no. of blocks of each type by multiplying a x to the ratio

No. of A blocks: $4x$ No. of B blocks: $7x$ No. of C blocks: $3x$ No. of D blocks: x

we know that the no. of A block is 50 more than no. of C blocks!

$$4x = 3x + 50$$

$$4x - 3x = 50$$

$$x = 50$$

By putting the value of x in

we get no. of block B

$$7x = 7 \times 50 = 350$$

Therefore the no. of block B is

350.

(b)

Solve:

→ For Discounted price:

$$\text{Original price} = 80\$$$

$$\text{Discount per} = 15\%$$

$$\text{Discount} = 80 \times \frac{15}{100}$$

$$= 80 \times 0.15 = 12$$

$$\text{Discounted Price} = 80 - 12 = 68$$

→ For sales Tax:

$$\text{sales Tax} = 10\%$$

$$= 68 \times \frac{10}{100} = 68 \times 0.10 = 6.80$$

→ For Final Price:

$$= 68 + 6.80$$

$$= 74.80$$

The Final price of the shoes
is \$74.80.

(c)

Solve : For travel time :

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = \frac{42 \text{ km}}{36 \text{ km/hr}}$$

$$\text{Time} = \frac{42}{36} \text{ hours}$$

$$\text{Time} = 1.1667 \text{ hours}$$

→ For arrival time

Departure + Travel Time

$$= 4:00 \text{ pm} + 1.1667 \text{ hours}$$

$$= 4:00 \text{ pm} \quad 5.1667 \text{ hours}$$

Date: _____

Day: _____

(b) Arrange the jumbled words:

i) teninsuperte
uninterrupted

ii) hweti
white

Qno7

(a)

Volume of cylinder = $\pi r^2 h$

$r = 30 \text{ cm}$ (convert to m : $r = 30 \text{ cm}$
 $= 0.3 \text{ m}$)

$h = 1 \text{ m}$

By putting values:

$$V = \pi \times (0.3)^2 \times 1$$

$$V = 3.14159 \times 0.09$$

$$V = 0.28274 \text{ cubic meters}$$

The volume of cylinder is

approximately 0.28274 cubic
meters.

Date: _____

Day: _____

(b)

Average age = 15 years

Ages in ratios 3 : 5 : 7

The total age of 3 boys is

$$3x + 5x + 7x = 15x$$

→ By find average age

$$\frac{15x}{3} = 15$$

$$15x = 45$$

$$x = \frac{45}{15} = 3$$

→ For individual ages:

$$= 3x \quad (\text{Putting value of } x)$$

$$= 3 \times 3 = 9 \text{ years.}$$

The age of youngest boy is
9 years.

Date: _____

Day: _____

(c) Identify the series

(i) 8, 19, 52, 151, 447

The next number should be 448 instead of 447, so 447 is the wrong in this series

(ii) 11, 13, 17, 19, 23, —

The next number in the series is 29.
