

## Question No. 02

### (a) Artificial Intelligence is the New Electricity

#### → Introduction:

The statement "artificial intelligence is the new electricity" highlight the transformative power of AI. AI revolutionized numerous industries. AI become essential component of life like electricity. Power various application from virtual assistants to self driving cars.

1. Transformed Industries: Electricity enabled mass production while AI has automated processes. Can enhanced decision making, and create new business models.

2. Improve Daily life: Electricity powered household appliances while AI enabled personalized recommendation and smart home automation.

4. Safety and Security: Electricity can be hazardous if not use properly while AI raise concern about data privacy.



(b)

## CPU Introduction:

The central processing unit sometime called brain of the computer due to its role in controlling the whole system. While the CPU and human brain are vastly different from each other but there are some interesting similarities.

→ Processing Centers: Both serve as the central processing units because both handling the information and executing instructions.

→ Control and Coordination: CPU control computer and brain control human body functions.

→ Memory and Storage: Both have memory and storage mechanisms.

The CPU uses RAM while human brain consist of short-term and long-term memory to store information.



## (C) → Introduction of Balance Diet:

A balance diet provide necessary nutrients in best propotion to support human health and well-being. It include variety of food such as fruits, vegetables, proteins, grains etc.

But the deficiency of these food groups lead human to many problems/imbalance.

### Deficiency of Vitamin A: The

deficiency of vitamin A lead to night blindness, dry eyes, and weakness.

### Deficiency of Vitamin B: Deficiency

of vitamin B can cause fatigue, weakness, nerve problems etc.

### Deficiency of Vitamin C

Deficiency of vitamin C can result in bleeding gums, poor wound healing and weakeend immune system.

Conclusively, balance diet is very important for our body and its imbalances can cause alot of diseases.



(d)

## → Optical Fibers:

These are thin strands of glass or fibers plastics that transmit signals over long distance. Work on internal reflection while continuously reflecting minimize signal loss.

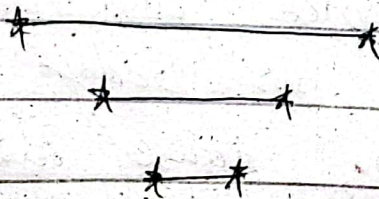
## → GPS:

Global Positioning System  
→ satellite based system that requires location and time information satellites orbiting Earth which continuously transmit signals

## 2D and 3D Location Measurement:

2D → GPS receivers calculate latitude and longitude. And it have two dimensional position in Earth.

3D → Information from additional satellites and the GPS can determine a three dimensional position, including elevation.





## Question. No. 03

(a)

### → Chemical Bonds:

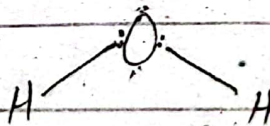
Atoms want to become stable and full their outer shell electrons so atoms form chemical bonds.

These chemical bonds formed by losing, gaining or sharing the electron to complete their valency.

For example HCl. Chlorine has seven outer electron for completion of valence shell it formed chemical bond with hydrogen because hydrogen have one electron in their valence shell.

### Covalent Bond in Water:

A water molecule ( $H_2O$ ) consist of two hydrogen and one oxygen atoms covalently bonded to each other. Oxygen share two electrons with each hydrogen atom forming a stable molecule.



structure of water molecule.



(b)

## Doping:

Doping is the process in which intentionally impurity is introduced to a pure substance to alter its electrical, optical, or mechanical properties. This process is mainly used in semiconductors to control their conductivity.

Types of Ceramics: There are many types of ceramics which are given below.

→ Traditional Ceramics: These are made from clay minerals which is used in pottery, bricks and tiles.

→ Advanced Ceramics: This type of ceramics is engineered materials with specific properties, such as high strength, heat resistance, and electrical conductivity.

Examples: alumina, zirconia and silicon.



## (C) Global Warming:

Global warming is the process in which the temperature of increase gradually from normal temperature. It cause due to many reason. e.g overpopulation etc.

### Merits of Global Warming:

Global warming can longer growing season in some regions for crops and increasing the shipping route due to melting of ice.

### Demerits of Global Warming:

Global warming has many demerits for instance extreme weather events e.g floods, storms, droughts and heatwaves and all these are very harmful for environment. Secondly, rise in sea level which is harmful for ecosystem and coastal community. Thirdly, change in temperature and precipitation patterns can disrupts habitats and harm biodiversity and beauty of environment.



(d)

## Introduction of Polio:

Polio is highly infectious disease which is caused by a virus called poliovirus. It mostly affecting children it can lead the patient into paralysis and even death.

## Challenges in Eradication in Pakistan:

Security Concerns: Due to security issues access to some areas ~~are~~ is very difficult. So, many children remain from vaccination.

## Misinformation and mistrust:

Misinformation and misconceptions about the polio vaccines leading to vaccines deficiency.

Conclusively, Polio is highly infectious disease and it is very difficult to survive with this disease. We want to <sup>take</sup> checkups and test every month and protect our children from polio



## Question No. 06

A

Boat length = 3m

Boat breadth = 2m

Sink of boat = 1cm (1cm = 0.01m)

Mass of the man = ?

As we know that

$$V = L \times B \times h \quad (\text{putting the values})$$

$$V = 3\text{m} \times 2\text{m} \times 0.01\text{m}$$

$$V = 0.06\text{m}^3$$

$$\text{Mass} = \text{Density} \times \text{Volume}$$

$$(\text{Density} = m/v)$$

$$\text{Mass} = 1000 \text{kg/m}^3 \times 0.06\text{m}^3$$

$$\boxed{\text{Mass} = 60\text{kg}}$$

(B)

B

17 balls sell = 720

Loss = Cost of 5 balls

Price of ball = ? (x)

Consider the ball price = x

$$\text{Loss} = 5(x)$$

$$\text{Cost 17 ball} = 17x$$

Cost = Cost price - Selling Price (put values)

$$5x = 17x - 720$$

(subtract 17x from both sides)

$$5x - 17x = 17x - 17x - 720$$

$$-12x = -720 \rightarrow$$



$$12x = 720 \quad \text{Divide by 12}$$

$$\frac{12x}{12} = \frac{720}{12}$$

$$x = 60$$

$$\boxed{\text{Cost price} = 60}$$

(c)

Present age of the son  
considered

$$\text{age of son} = x$$

$$\text{Father age} = x + 24$$

After two years

$$\text{age of son} = x + 2$$

$$\text{age of father} = x + 24 + 2$$

Father age in 2 years = 2 x son's age

$$(x + 26) = (x + 2) \times 2$$

$$x + 26 = 2x + 4$$

$$x - 2x = 4 - 26$$

$$\boxed{x = 22} \quad \text{Present age}$$

→ Rashid typing speed:

$$\text{Page per hour} = \frac{16}{32} = \frac{16}{63} = \frac{16}{3}$$

$$\rightarrow \text{Kamran} = \frac{40}{5} = 8/\text{hours}$$



Combining the speed.

$$\frac{16}{3} + \frac{8}{1} = \frac{16 + 24}{3} = \frac{40}{3} \text{ page/hr}$$

Now time required for 110 pages

$$\frac{110}{40/3} = \frac{110 \times 3}{40} = \frac{33}{4} = 8.25$$

$$4 \overline{) 33} \\ \underline{32} \\ 10 \\ \underline{8} \\ 2$$

So

110 pages required 8.25 hrs

(Question # 08)

(a)

a) Area of the Park = ?

$$\text{Length of Park} = 3x$$

$$\text{breadth of Park} = 2x$$

$$\text{Perimeter of Park} = 2 \times (\text{length} + \text{breadth}) \\ = 2 \times (3x + 2x) = 10x$$

$$\text{Cycle speed} = 12 \text{ km/hr}$$

$$\text{Convert km/hr to m/min} = 12 \times \left( \frac{1000 \text{ m}}{1000} \right) \times \left( \frac{1 \text{ hr}}{60 \text{ min}} \right) \\ = 4 \times 50 = 200 \text{ m/min}$$

1 round in 8 min

$$\text{Distance} = \text{Speed} \times \text{time} = 200 \times 8 = 1600$$

$$\text{Perimeter of park} = \text{Distance}$$

$$\frac{10x}{10} = \frac{1600}{10}$$

$$x = 160$$



Area = Length  $\times$  Breadth

$$\text{Area} = 3x \times 2x = 6x^2 \quad \text{put the value of } x$$

$$\text{Area} = 6 \times (160)^2$$

$$\text{Area} = 6 \times 25,600$$

$$\boxed{\text{Area} = 153,600}$$

(B)

Boy relation with girl.

Father of Uncle = grandfather

Daughter of grandfather = Aunt

Son of Aunt = Cousin

So, Relation of boy to girl =  $\boxed{\text{Cousin}}$

(C)

(C)

Let's, ten's digit =  $x$

One's digit =  $x + 2$

Two digit number =  $10x + (x + 2) = 11x + 2$

$$\text{Sum of digit} = x + (x + 2) = 2x + 2$$

The sum of these two digits = 144

$$(11x + 2) \times (2x + 2) = 144$$

$$22x^2 + 22x + 4x + 4 = 144$$

$$22x^2 + 26x + 4 = 144$$

$$22x^2 + 26x = 144 - 4 = 140$$

$$22x^2 + 26x - 140 = 0 \quad (\text{Divide by 2})$$

$$11x^2 + 13x - 70 = 0$$



$$n = 2$$

Therefore the ten digit = 2

$$\text{Unit digit} = 2 + 2 = 4$$

$$\text{Two digit no} = 24$$

D

(D)

$$\text{LCM of two numbers} = 48$$

$$\text{Numbers ratio} = 2:3$$

$$\text{Sum of number} = ?$$

Considered

$$2y \ \& \ 3y = 6y$$

$$\text{LCM} = 48$$

$$6y = 48$$

Divide by 6

$$\frac{6y}{6} = \frac{48}{6}$$

$$y = 8$$

$$\text{1st number} = 2y = 2(8) = 16$$

$$\text{2nd number} = 3y = 3(8) = 24$$

add these numbers

$$16 + 24 = 40$$