

Good for math portion  
Increase length of theory portion  
Add headings  
Draw diagrams

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DATE: / /

### SECTION II

Q6.

(a). Son's age now = 30  
Son's age 5 years ago =  $30 - 5$   
= 25 years old

Five years ago, age of father was thrice the age of son.

Father's age then =  $3(\text{son's age five years ago})$   
=  $3(25)$   
= 75

Current age of father (five years later)  
=  $75 + 5$   
= 80 years old.

(b) Mean =  $\frac{\text{sum of all numbers}}{n}$

Hence  
 $50 = \frac{10 + 30 + y + 50}{4}$

$200 = 10 + 30 + y + 50$

$200 = y + 90$

$200 - 90 = y$

$110 = y$

(c) ii. 2, 6, 18, 54, \_\_\_\_\_

This has the pattern of:

DATE: / /

$$2 \times 2 = 4 + 2 = 6$$

$$6 \times 2 = 12 + 6 = 18$$

$$18 \times 2 = 36 + 18 = 54$$

$$54 \times 2 = 108 + 54 = 162$$

2, 6, 18, 54, 162

ii. ~~3125, 256, —, 4, 1~~

(d) Product of two numbers,

$$x \times y = 320 \quad \text{--- (1)}$$

Ratio of two numbers:

$$x : y = 1 : 5$$

$$\frac{x}{y} = \frac{1}{5} \quad \text{--- (2)}$$

From (2)

$$x = \frac{y}{5} \quad \text{--- (3)}$$

Putting in (1)

$$\left[ \frac{y}{5} \right] \times y = 320$$

$$\frac{y^2}{5} = 320$$

$$y^2 = 1600$$

Taking square root.

DATE:   /  /  

$$\sqrt{y^2} = \sqrt{1600}$$
$$y = 40$$

Finding  $x$  from equation (3):

$$x = \frac{y}{5}$$

$$x = \frac{40}{5}$$

$$x = 8$$

Now, difference between the squares of these two numbers

$$(x^2) - (y^2) = ?$$

$$= 8^2 - 40^2$$

$$= 64 - 1600$$

$$= -1536$$

$$= 40^2 - 8^2$$

$$= 1600 - 64$$

$$= 1536$$

Q7

(b)

| Men | Hours | Days |
|-----|-------|------|
| 195 | 16    | 20   |
| $x$ | 13    | 15   |

$$\frac{x}{195} = \frac{10}{13} \times \frac{20}{15}$$

$$\frac{x}{195} = \frac{200}{195}$$

DATE: \_\_\_/\_\_\_/\_\_\_

200 men are employed to finish the job in 15 days if they work 13 hours a day.

(c)

$$A = \{a, e, i, o, u\}$$

$$U = \{a, b, c, \dots, z\}$$

$$A' = U - A$$

$$= \{a, b, c, \dots, z\} - \{a, e, i, o, u\}$$

$$= \{b, c, d, f, g, h, j, \dots, z\}$$

DATE \_\_\_/\_\_\_/\_\_\_

## SECTION 1

Q2:

### (b) Solid Waste Management

Solid waste is any refuse or waste material including liquid sludge that is produced or usually as a result of human activities. The management techniques used to handle this waste is called solid waste management system.

#### causes:

- domestic and household activities
- agriculture, healthcare industry, retail industry etc.

#### methods:

There are several methods to manage solid waste

→ incineration:

It is the burning of solid waste. However, it is a unhealthy method as it produces a number of toxic gases

→ landfills.

The burying of solid waste over or under the ground is known as landfilling.

These are specific areas away from residential and commercial zones.

DATE: \_\_\_/\_\_\_/\_\_\_

- some developed countries export their solid waste to under developed countries and pay them a certain amount.

## (c) **Balanced Diet**

A balanced diet consists of both micronutrients and macro-nutrients. These are necessary for a healthy living and promotes growth in human bodies.

**macronutrients:** nutrients that are required in the bodies in large quantities. These include, carbohydrates, proteins, fats, fibre and water.

**micronutrients:** nutrients that are required in the body in small quantities. This includes zinc, calcium, iodine etc.

### **proteins:**

- proteins are a chain of amino acids.
- It is found in meat, fish and grains.
- Promotes muscle health, repairs and grows muscles.

### **carbohydrates:**

- nutrients that contain carbon and hydrogen.
- Source of glucose; provides energy for the body.
- found in rice, bread, etc.

### **fats**

- Fats provide energy to the body.
  - Also help in body insulation.
- Healthy fats found in milk, cheese, avocados etc.

DATE: \_\_\_/\_\_\_/\_\_\_

### fibre

Fibres are necessary for a healthy digestive system and absorption of nutrients.

### water

- our bodies are 70% water
- Maintains balance, promotes healthy living, removes unhealthy toxins.

### malnutrition

malnutrition is a result of not having a healthy balanced diet. A lack of essential nutrients, disrupts the normal functioning of body. Certain illnesses can also make human beings prone to malnutrition. As a result, they may need proper treatment to make their bodies function properly.

### (d). Renewable Energy Resources under CPEC

CPEC has brought forth both renewable and non-renewable energy resources.

Renewable Energy sources include wind, solar and hydel energy.

Renewable energy is energy that can be replenished and does not contribute to harmful gases.

DATE: \_\_\_/\_\_\_/\_\_\_

### Solar energy

Solar energy is the use of sun to power electricity. It uses solar cells.

These are used for both domestic and commercial purposes.

### Wind energy

Wind energy is formed as a result of kinetic energy from the flowing of winds.

Windmills are used to collect and convert this kinetic energy into electricity.

### Hydel energy

It uses the movement of water to produce electricity in the forms of ~~dams~~ dams or diversion structure.



Q5.

| (a) | RAM   | ROM   |
|-----|---|---|
| →   | Random Access Memory                                  | Read Only Memory                                |
| →   | Memory that stores and processes information          | Memory that is used when computer boots up      |
| →   | Can be changed, modified, deleted                     | It is permanent and cannot be changed           |
| →   | Increases speed of computer                           | is rather slow                                  |
| →   | expensive   | rather cheap                                    |
| →   | needs power supply to function or information is lost | does not need power supply to store information |

**USB**

Universal Serial Bus is a portable device that is used to store data and information. It comes in various sizes and can store a large number of data

DATE: \_\_\_/\_\_\_/\_\_\_

## (b). Artificial Intelligence

Artificial intelligence is the simulation of human intelligence by machines, especially computer systems.

John McCarthy coined the term Artificial intelligence in 1956.

AI aims to pursue 4 main goals:

→ systems that think like humans

→ systems that act like humans

→ systems that think rationally

→ systems that act rationally

AI has revolutionized the world in many ways.

→ AI has made work easier,

AI can do rational process almost like humans. It is fast and reliable. Many industries and factories use AI to reduce cost and labour.

→ AI has helped in research and development.

→ AI in healthcare, education etc.

## (c) Optical Fiber

Optical fiber is the medium and technology used in the transmission of information in the form of light pulses. Fiber optics is the science of optical fibre.

Optical fibre consists of

- core
- cladding
- buffer
- extra jacket

### core

core is the hollow <sup>inner</sup> tube made of glass or plastic that reflects light.

### cladding

cladding is the layer above core which is made of glass or plastic. Refractive index of cladding is higher than the core.

It reduces the loss of energy by reducing the scattering of light.

It also protects the core.

### buffer:

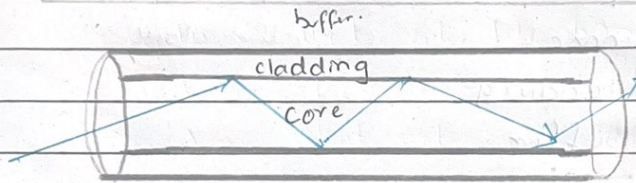
Buffer is usually of rubber that

DATE: \_\_\_/\_\_\_/\_\_\_

provide strength and protection to the optical fibre.

## jacket

The jacket is the outer layer that we see. It is coloured to distinguish it.



## Advantages

- is fast and reliable
- can be used for longer distances
- is more efficient than other forms of data transmission
- one of the main uses is providing internet for domestic and commercial purposes.