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Good for theory portion
Increase length
Add more headings
Draw diagrams
Work on math portion

General Science and Ability

Q No. 2

a)

Key Features of COP-28: loss and damage fund:

In November 2023, COP-28 was held in UAE. The CEO of AbuDhabi's largest fossil fuel compory "ADNOC", Mr. Salman Al Jabir, was the President of last year's Conference of parties. It was one of the largest summits in history regarding climate change. The key development of COP-28 was the creation of loss and damage fund. Developing countries raised their voice regarding this matter in the previous COPs. Pakistan actively advocated for the creation of this fund in COP-27. It is an essential step towards the mitigation of losses which occurred due to climate change.

Important Features:

1. The initial pledge was made for 300 Billion dollars.
2. US alone contributed 3B$ and EU pledged for 300M$.
3. The overall fund couldnot exceed 5B$.
4. The fund was made by a joint concensus of climate activist and fossil fuel industry.
5. The fund shall be given to countries on certain conditions.

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6. Most of these conditions include a strong commitment towards sustainable developing and reducing the emission of green house gases.

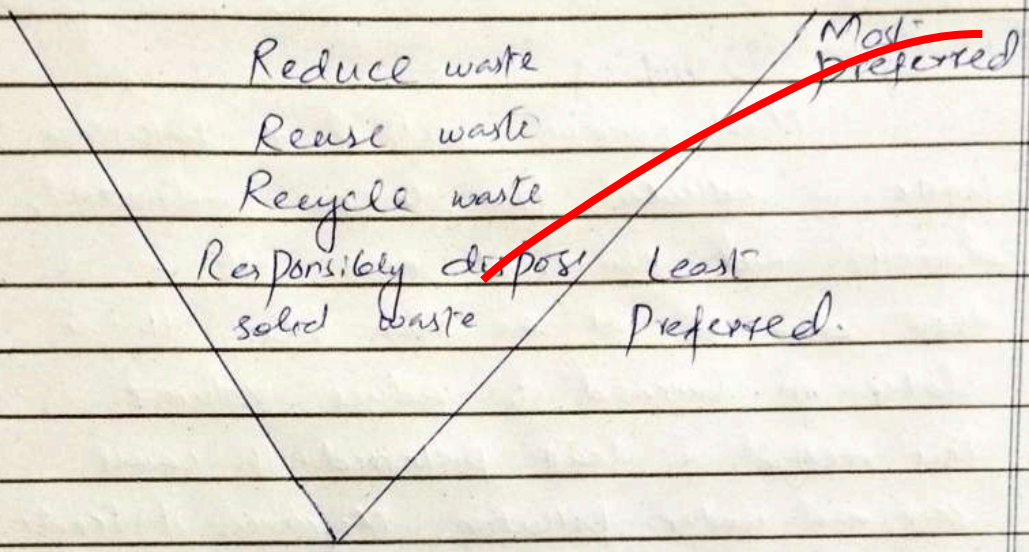
Financial Issues of developing countries; Challenges and limitation.

1. Although initially 300 B$ were asked by the developing countries, only 4B $ could be raised.
2. Developing countries dont only require fund, They also require the infrastructure and capacity for utilising these funds for climate change mitigation. Unfortunately, most of the 3rd world countries that are badly affected by climate change dont have the capacity and resilience to bear these changes.
3. In developing countries, more than 40% of population is living in poverty. These poor communities are especially vulnerable to climate change. Without human development, it is very difficult to manage the effects of climate change.

6. Solid waste management; Discuss different methods.

Solid waste management is defined by "Reducing, reusing and disposing solid waste in a way that reduces its volume while causing minimal harm to the environment".

R's of solid waste management:



Reduce waste:

1- Dont buy single use item
2. Dont hoard items that you dont need

Reuse waste:

1- Reuse is different from recycle.
2- In reuse, the product isn't processed again, instead it is reused for some other purpose
eg empty plastic bottles as vase.

Recycle

1- Here waste is segregated and reprocessed.
2. e.g recycling plastic for producing RDF pellets

Responsible Disposal:

Steps:
Collection → Transportation → Segregation → Disposal

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Methods:

1- Open Dumping

Most common method in Pakistan. Waste is collected from various industrial, domestic and commercial areas. It is then dumped at an open site. It is later on burned to reduce volume. This method is least preferred. It causes air and water pollution. Moreover, it leads to spread of diseases

2- Land fills:

It is a preferred method. In a land fill, waste is stored and alternatively layered with clay. Landfill is designed in a way that it is covered with impermeable clay on all sides. Rain water is collected in a separate drain. The leechate water is not released in the ground. This method reduces waste without causing harm to the environment

3. Incineration:

Waste is burned at a specific Pressure and high Temperature. It is mostly used for harmful waste

4- Balanced Diet

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" A diet which contains all essential macro and micronutrients in adequate amount for the growth and nourishment of body "

Purpose of balanced diet:

1- **Ensure growth and development:**

A diet which is adequate in nutrients and minerals ensures growth and development

2- **Prevent diseases and disability:**

One essential purpose of balanced diet is to prevent diseases. All parts of body require energy. Specific vitamins and minerals are required by specific organs. A balanced diet prevents diseases and disability. It ensures longivity, mental and physical wellbeing

Components of Balanced Diet:

1- **Essential food groups**

a) Proteins e.g meat
b) Carbohydrates e.g vegetables, fruits, flours
c) Fats e.g oils, ghee

Ratio

Carbohydrates : 50-60%
Proteins : 30%
Fats : 10-20%

Vitamins:

→ Water soluble vitamins
Vit B, C, E

→ Fat soluble vitamins
Vit A, D, K, E

Minerals:

→ Macrominerals
Iron, Calcium etc

→ Microminerals
zinc, iodine etc

Water:

A balanced diet requires 10-12 glass of water daily

d) Renewable Energy Sources in CPEC

China Pakistan Economic Corridor has completed a decade. The 64 B$ project has brought many improvement in Pakistan's energy, infrastructure and transportation. Important renewable energy sources include

1. Wind Energy.

The coastal belt of Pakistan is spread on 1400 km. Winds blow at a high speed in these areas. Under CPEC two wind power plants have

been installed. One in Balochistan and one in Sindh. The powerplant in Dalbandin is almost functional now. Each project is capable of generating 700 MW of electricity

Solar Power plant:

Quaid-e-Azam Solar power plant in Bahawalpur is installed under CPEC. It can add 1100 MW of electricity in the system

Hydroelectric Power Plant:

More than five hydroelectric power plants are added in the generation sector. They are installed in Sahiwal, Sukkur, Kemari and Kumrat

Q NO 5

a) Distinguish between RAM and ROM

RAM	ROM
Random Access Memory	Read only Memory
It is a temporary memory	It is a permanent memory
The memory is volatile	The memory is non-volatile.

It doesn't contain bootup instructions to start the computer. The data in RAM can be read, written, changed, stored or deleted.	It contains boot-up instructions to start the computer. The data in ROM can only be read.
The examples of RAM include - Dynamic RAM - Static RAM.	The examples of ROM include - P-ROM - EP-ROM

6)

How AI has revolutioned the world? Justify

Artificial Intelligence.

Artificial intelligence is the biggest invention of 21st century.

AI is defined as:

"The simulation of human thinking pattern and intelligence by Machines to carry out their task effectively"

There are four main types of AI

Reactive Machines

Learned Memory

Theory of Mind

Self Awareness.

AI's Revolution.

Artificial Intelligence is being used in all walks of life today. From an individual sitting in the comfort of his room to a worker in an industry. AI's widespread use has changed the work patterns. It has improved efficiency while saving cost and time. Important areas where AI has brought significant changes in are:

1- **Education:**

With AI, now Universal education may not be a dream. Many students are using AI chatbots like ChatGPT for learning. Other than bots, AI has the ability to change and adapt to new teaching method according to the end user which in this case is the student

2. **Health care**

AI's advancements in healthcare have brought many benefits to the doctors as well as the patient. **IBM Watson**, an AI tool introduced by IBM can help in diagnosis & treatment of patient.

3. **Industry and Finance:**

This is the era

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digital marketing. All business are working on digital platforms. AI is helping owners and entrepreneurs as well as the customers in online shopping. AI bots answer all customer queries. They analyze customer reviews and preferences which is then used by the producer to modify his product according to the need of consumer.

Other important areas include:

→ Online gaming and sports
→ Automation
→ Retail and Banking
→ Software and Programming
→ Social media

(C)

Working of Optical Fiber:

Optical fiber is a thin strand of fibre that transmits light signals at a very high speed.

Mechanism:

Optical fibers work on the principle of **Total internal reflection**. Optical fiber is made up of two layers i.e. **the core and the cladding**. Core is the internal part while cladding is the outer

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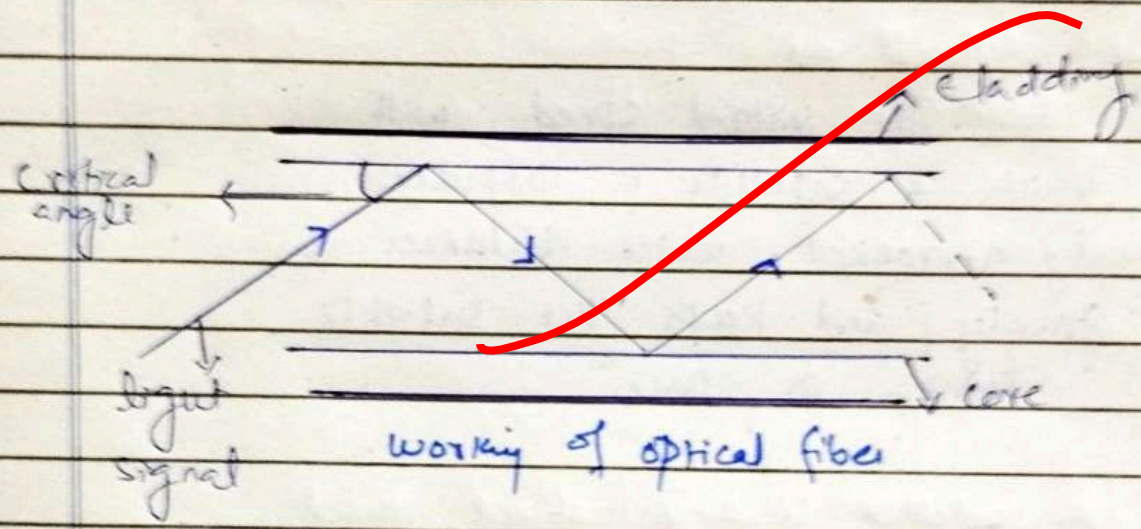
external part. When light enters into core at a specific angle, it is reflected internally instead of leaving out. This angle is called as the **critical angle**.



working of optical fiber

Advantages of optical fiber:

1- **Telecommunication**

Today, optical fibers have almost completely replaced traditional wires in telecommunication. This is because they provide

1- A very fast speed
2- Take minimal space
3- Highly efficient

Other uses include :-

1. Weapons and rockets
2. Satellites

a)

Critical speed of Satellite:

A satellite is propulsed into space via rocket. Critical speed is defined as:

"The initial speed with which a satellite is populsed by a rocket, which balances against gravity and keeps the satellite moving in space"

A satellite is any object that revolves around a cellestial body. They are sent from earth into space for gathering information about the process of earth. Each satellite includes a bus, a propulsion system, a communication tower, an altitude control centre and a temperature control centre. The speed at which satellites revolves and rotates in space depend on the critical speed of satellite.

Types of satellites:

1- Geostationary satellite:

This satellite moves around the earth in the same

motion and direction as the earth. Hence, the satellite always seems to be in the same position, however, it moves aligned with the earth.

e.g Global Positional System.

b. Polar Satellite:

These satellites move from pole to pole. Their motion is not aligned with the motion of earth.

eg International space laboratory.

Section II

Q No 6

a)

Age of father = x

Age of son = y

5 year ago

Age of father = $x - 5$

Age of son = $y - 5$

Currently, $y = 30$.

$x = ?$

5 years ago

Age of father = 3x age of son

$x - 5 = 3(y - 5)$

$x - 5 = 3y - 15$

$x - 5 = 3x - 15$

$x - 5 = 3(30) - 15$

$x = 90 - 15 + 5$

$x = 90 - 10$

$x = 80$

(b)

Mean of 10, 30, y, 50 is 50

$y = ?$

Mean = $\frac{\text{Sum of all numbers}}{\text{total quantities}}$

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

$50 \times 4 = 90 + y$

$y = 200 - 90$

$= 110$

(c)

Missing items

2, 6, 18, 54, ——

2, 6, 18, 54, 162

each value is being multiplied by 3 to get the next value

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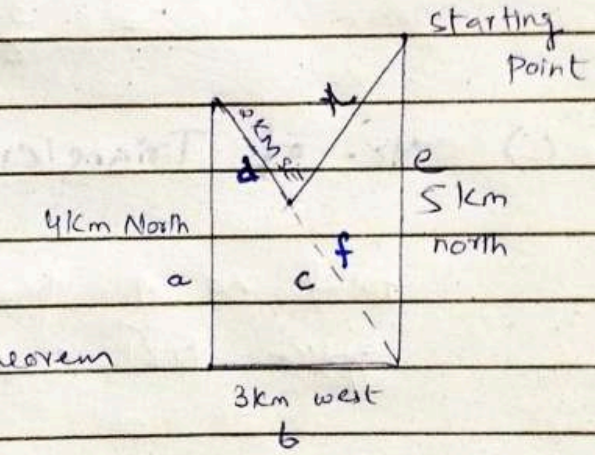
ii) 3125, 256, ___, 4, 1

3125, 256, 16, 4, 1

each is the square root of Consecutive multiples of two.

No. 8

a)



applying Pythagoras theorem

$(c)^2 = (a)^2 + (b)^2$

$(c)^2 = (4)^2 + (3)^2$

$= 16 + 9$

$(c)^2 = 25$

$c = 5$

c is divided into d and f

$c - d = f$

$f = 5 - 2$

$= 3$.

Applying theorem again

$(e)^2 = (f)^2 + (x)^2$

$(5)^2 = (3)^2 + (x)^2$

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$x^2 = 25 - 9$

$x = 4.$

Cow is 4 km from the starting pond

6)

Total slices = 8

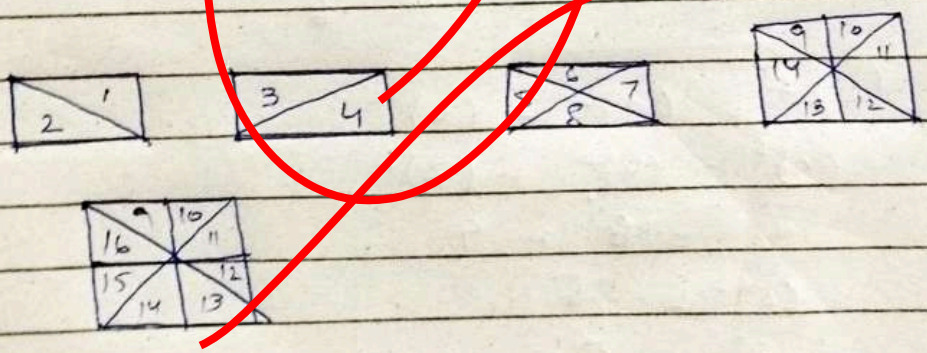
slices with resins = 3

Probability = $\frac{\text{desired outcome}}{\text{Total possible outcome}}$

$= \frac{3}{8}$

c) No. of Triangles

Total no of triangles in the given picture are sixteen.



d) Factors affecting IQ

$IQ = \frac{\text{Mental age}}{\text{chronological age}} \times 100$

Factors affecting intelligence quotient:

1- **Genetics:**

Intelligence of a person depends on genetics. Although brain improves and grows with age and cognitive functions get better but most of the intelligence is determined at birth.

2- **Age:**

IQ is specific to mental and chronological age. That is why whether adult and children intelligence scales are designed differently. With advancing age, cognition declines.

3. **Education and social exposure:**

According to the two factor theory of IQ, there is general and special intelligence in every person. Although general intelligence is pre-determined, special intelligence can be learned and improved throughout life.

4. **Mental Health and Diseases:**

In certain neurological and Psychological illnesses, mental functions decline. Patients suffering from stroke, Alzheimers, brain infections, catatonic schizophrenia may not have the same IQ in illness that they had in health.