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GSA Mock

Q2) a) 1) Introduction : Floods of 2022

Pakistan was left exposed in the face of massive floods that engulfed the country. The damage induced by these floods was devastating, with around RS 3.2 trn of damage and Rs 3.3 trn of economic losses.

2) Pledges in Cop 27:

Cop 27 was held in Egypt in Sharm-EL-Sheikh on 6 Nov, 2022. In the conference Pakistan vehemently presented it case, appealing to the world's sense of compassion. The country based its arguments around the fact that its contribution to global climate deterioration was negligible, yet it had to bear the brunt of the affect, and should therefore receive some sort of compensation for these losses. To the surprise of Pakistan, the response was overwhelming, with many countries pledging financial

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assistance to the inundated country.

3) COP 28 in UAE

COP 28 will be held on 30th November in Dubai. After last year's historic pledges, Pakistan would be pressing the member-states to make good on their promises. Also many climate-battered developing states would be seeking to garner support for climate financing in an attempt to recover some of the losses they had to bear in the face of declining climate.

b) 1) Introduction:

Vitamins are an essential part of nutrition, and are necessary to maintain good health. Deficiencies in Vitamins often occur if food intake is distorted or if ~~food~~ dietary intake in circumscribe to particular foods. Vitamins can be classified into 2 categories which are as follows:

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2) Water Soluble Vitamins:

These are the type of vitamins that can ~~be~~ are dissolved in water. such type of vitamins are are generally not stored in the body and excess is excreted in urine. Vitamins that generally fall in this category are Vitamic C and various B vitamins: B1, B2, B3, B4, B5, B6 ....

2.1) Diets Rich in Water-Soluble Vitamins:

Vitamic C: Vitamic C is abundently present in citrus fruits like lemon, oranges, strawberr

Vitamin B: B family vitamins are present in diverse food sources such as eggs, Beef, legumes, Milk etc

3) Fat soluble vitamins:

These are the type of vitamins that dissolve in fat. They can be stored in body in liver and fatty issues and excess can lead to toxicity.

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Fat soluble vitamins include Vitamin A, D, E, K.

3.1) Diet rich in Fat soluble Vitamins

Vitamin A: Vitamin A is typically found in potatoes, carrots, spinach, kale, eggs.

Vitamin D: synthesized by the skin when exposed to sunlight, also found in fatty fish, egg yolks.

Vitamin K: is abundantly present in nuts, seeds, vegetable oils.

Vitamin E: Found in leaf green vegetables, nuts, seeds.

c) 1) Introduction:

Eye is a complex and intricate organ that is responsible for our vision. There are several component that work together to capture and process visual information

2) Main components of Eye:

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Sclera: It is the outer most layer of the eye. It is the white part of the eye. Its main purpose is to maintain the shape of the eye.

Cornia: It is the transparent part of the eye which is mostly responsible forusing light into the eye and onto the ratina.

Choroid: These are ~~the~~ a layer of blood vessels that nourish the ratina. It is situated b/w sclera and ratina.

Ratina: This is the innermost layer of the eye. It ~~sends~~ contains photorecepter cells that capture light and convert it into electrical signals.

Iris

~~Lens~~: It is the colored part of the eye that controls the size of the pupil and amount of light entering the eye.

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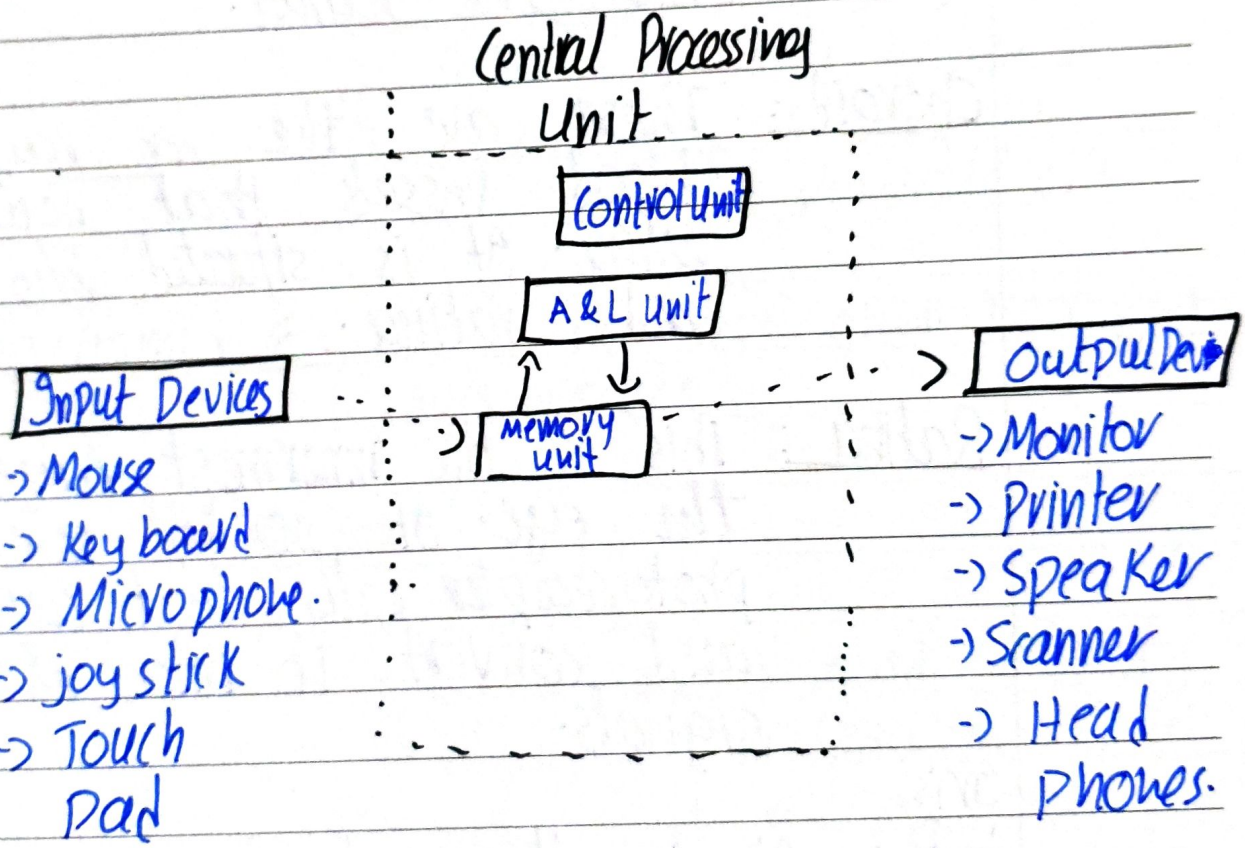
Lens: It is the transparent structure located at the back of of Iris. Its main purpose is to Focus Light on to the retina.

Pupil: The black circular opening in the center of Iris. Its aim is to regulate the amount of light entering the eye.

5a)



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b) 1) What is Optical Fiber:

Optical fiber comprises of strands of glass, which is used for transmitting light [ie photons/ energy packets], from one point to another. The main purpose of optical fibers is to transmit information or digital data from one point to another.

2) Constituents of optical Fiber:

Optical Fiber consists of 2 part, namely core and cladding.

2.1) Core:

Core is the central part of an optical fiber. It high density and high refractive index, both of which are crucial for transmitting information

2.2) Cladding:

Cladding is the part that surrounds the core and has a lower refractive index compared to that of the core

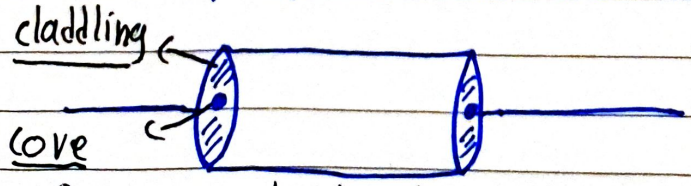

Figure: Optical Fiber and its main constituents

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3) How an optical Fiber works :

Optical Fibers work through the phenomenon of total internal reflection. Light travels down the optical fiber by bouncing of the walls. Total internal reflects enables this bouncing of the light within the cable, preventing it from travelling out from the edges. Total internal reflection occurs when critical angle is achieved, when angle of incidence at which angle of refraction becomes equal to 90°. This enables the light to reflect back at the core-claddling boundary.

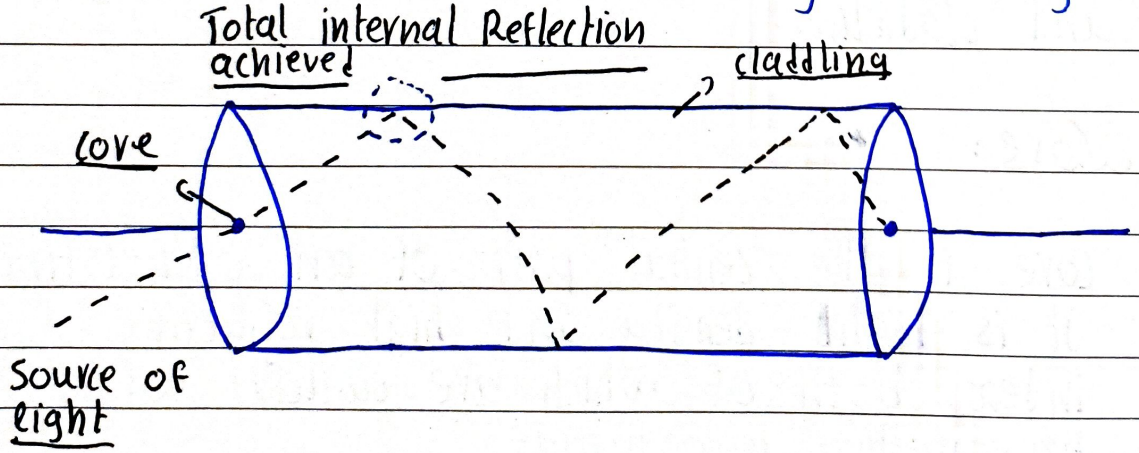

Figure : working of an optical fiber

a) i) Solid Management System:

Solid waste management system refers to the organised collection, transportation, disposal, and recycling of solid waste materials generated by households, industries, commercial establishments, and institutions. Solid waste management system typically consists of the following steps:

Waste Generation: Solid waste is generated from various sectors

On-Site handling: This step involves collecting the waste from various locations

On-Site Processing: During the collation phase, the wase is first segregated, based of its ilk i.e recyclable, hazardous etc, and then placed in apposite containers.

Waste Transportation: Waste is transported from the collection point to treatment facilities or disposal sites.

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Treatment: Some waste needs to be treated first, because of it hazardous nature, ~~and then~~ before it can be safely disposed.

Disposal: Non-Recyclable & non-Recoverable waste can be disposed of through various methods.

1) Geographic Information System:

GIS stands for Geographic Information System, which is a powerful tool used for capturing, storing, analysing, and presenting geographically referenced or spatial data. It combines geographic data (maps) with attributes (data associated with the geographic features) to provide a better understanding of the relationships, patterns, and trends within the data.

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2) Components of GIS:

2.1) **Hardware**: This includes the physical devices needed to operate GIS, such as computers, servers, GPS receivers, scanners.

2.2) **Software**: is the core component that facilitates data manipulation, analysis and visualisation. eg ArcGIS, QGIS etc.

2.3) **Data**: Geographic data is fundemental to GIS. It includes spatial data (geometric information) and attribute data (descriptive information).

2.4) **Methods**: GIS employs various methods and techniques for data analysis. These methods help uncover patterns, relation ships, and insights within the data.

2.5) **Visualisation**: GIS tools provide the capability to visualise geographic data through maps, charts.

2.6) **Data Models**: Uses data models to represent real-world features in a digital format. common data models include

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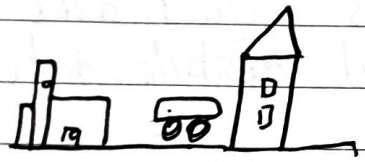
vector data models.

2.7) Remote Sensing: involves using satellite or aerial imagery to collect data about Earth's surface.

2.8) GPS: Global Positioning system provides accurate location information whis is essential for data collection.

Real world



GIS Data

Full view
Elevations
Buildings
Routes
Boundaries
Water Bodies
Your Data

Fig 1: Over view of Gis

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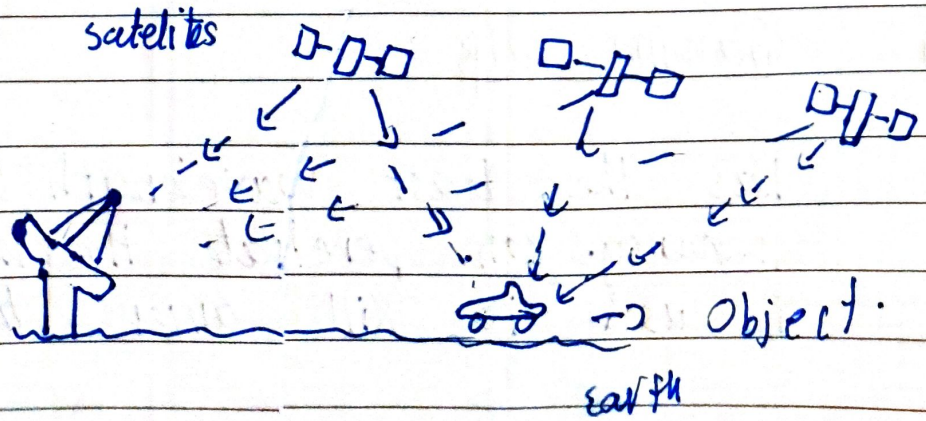
1) What is GPS:

Global positioning System is a satellite-based navigation system designed by the US department of Defense. It consists of a network of 24 ~~satellit~~ satellites placed into orbit. This system can work in any weath conditions and works 24 hours a day.

2) How does the GPS system work:

The Gps satelities orbit the earth twice sending signals to earth. The GPS receiver receives the transmitted signals and uses triangulation to calculate the user's exact location. It calculates the time when the signal was transmitted and received and uses the time difference to accurately determine the exact position. It uses threes satelites for 2D position & four satelites to determine 3D position of the object i.e (latitude, longitude, altitude.



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Section II

Q7

a) Total seats = 400
occupied = 325

Percentage of those who attended

Seats	:	Percentage
400	=	100
325	=	x

$$400x = 325 \times 100$$
$$x = \frac{325 \times 100}{400}$$

$$\boxed{x = 81.25\%}$$

$$4\overline{)325} = 81.25$$
32
05
4
10
8
20
20
xx

The Percentage of those attended is 81.25 %.

b)

Sugar		Days		Persons
40	↑ :	10	↓ :	30
320	:	x	:	80

$$\frac{10}{x} = \frac{40}{320} \times \frac{80}{30}$$

$$\frac{10}{x} = \frac{40 \times 80}{320 \times 30}$$

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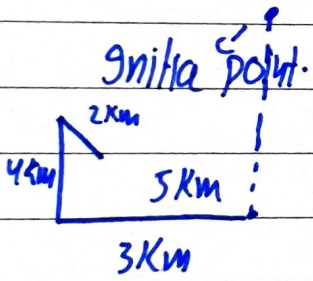
$$x = \frac{10 \times 320 \times 30}{40 \times 80}$$

$x = 30$ days

It will take 30 days for 80 persons to use 320 grams of sugar.

c)



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

$$= \frac{22}{7} \times (10)^2 \times (30)$$

$$= \frac{22}{7} \times 100 \times 36$$

Volume of cylinder = 11,314.29

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Q 8) a) B, R, O, T, H, E, R ↔ Q, D, G, S, N, Q, A

→ The word T E R can be changed with Q, D, S

→ For the first 3 letters use 1 letter previous

→ SO sister can be written as:

Q D S R H R.

b) i) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

8 ⇒ Probability = $\frac{\text{no. of possibilities}}{\text{total outcomes}}$

$$\boxed{\frac{1}{12}}$$

ii) Probability: $\frac{6}{12} = \frac{1}{2}$

iii) Probability = $\frac{3}{12} = \frac{1}{4}$

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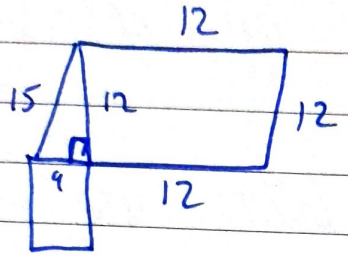
iv) 0

v) 1

c)



$H^2 = P^2 + B^2$

$15^2 = 12^2 + B^2$

$225 - 144 = B^2$

$81 = B^2$

$9 = B$

Total Perimeter will be

~~Sq cm + Sq cm + Sq cm~~

~~[12+12+12+9]~~

$12 + 12 + 12 + 15 + 9 + 9 + 9$

$= 78$ cm.

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d) 1) mean $= \frac{15+15+16+16+16+17+17+18+19}{9}$

$$\boxed{16.5}$$

2) median : 15, 15, 16, 16, 16, 17, 17, 18, 19

$$\boxed{16}$$

3) mode : 16 -> most repeated value.

4) range = largest no. - smallest no.

19 - 15

$$\boxed{4}$$

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