

Dos and Don'ts for General Science & Ability Paper

Day: MTWTFES

Date: / /

Hi there, you've done well. Know that acquiring knowledge is one thing and reproducing it in a paper according to what's asked is another. There are a few things I would like to highlight.

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1. A 5 marks part requires at least 2 and at max 3 sides of a paper. Know that there can be two or three parts of a question and their marks are divided accordingly. So, address all of them in a just manner.

Subject: General Science and Ability

Date: 10 July 2024

PART II

2. Focus on time management. You get 35 minutes to solve one question and about 8 minutes per 5 mark part. Manage your time accordingly.

SECTION-I

QUESTION NO 4

Part A)

3. You need to understand that your paper is supposed to look more scientific than theoretical. So, add flowcharts and diagrams where required.

Write a note on liver juice "Bile"

BILE

4. Your handwriting and neatness can be really impactful. Avoid cutting and overwriting.

5. Focus on your spelling and your grammar.

Here, in GSA there's no reduction in marks but your expression will definitely create an impact.

Bile is a bitter tasting, dark green to yellowish brown fluid, produced by the liver, it is stored in the gall bladder and upon eating is discharged into the duodenum.

6. In ability portion, give explanation for analytical ability question in words: You need to understand that a 5 mark part requires all steps written and explained.

Good luck for CSS 2025. You're gonna rock in sha Allah. :)

COMPOSITION OF BILE

The main components of bile are water, bile salts, bile pigments and cholesterol.

Water	85%
Bile salts	10%
Pigments	3%
Fats	1%
Inorganic salts	0.7%
Cholesterol	0.3%

PHYSICAL PROPERTIES

1. **Hepatic bile:** $\text{pH} = 7.4$. Its colour is golden yellow.

2. **Bladder bile:** $\text{pH} = 6.8$. Its colour is green dark to yellow.

Volume of bile produced reaches to one liter of bile per day.

BILE SECRETION STIMULATION

1. When food is released from the stomach into the duodenum in the form of chyme, the duodenum releases "Cholecystokinin", which is the main stimulant causing the

gall bladder to release the concentrated bile to complete digestion.

2. Gastrin and Secretin also stimulate bile secretion.
3. Lack of bile salts in the enterohepatic circulation stimulates bile synthesis and secretion.

FUNCTIONS OF BILE JUICE

a) Digestion and absorption of fats

Bile juice plays a crucial role in the digestion and absorption of fats. It breaks down food into smaller particles, making it easier for digestive enzymes to further break them down. This process called **Emulsification** allows for efficient absorption of fats and fat soluble vitamins (A, D, E, and K) in the small intestine.

b) PH balance and antimicrobial effects

Bile juice helps maintain a healthy PH balance in the intestines, which is essential for proper digestion and the growth of beneficial gut bacteria. Additionally, bile juice has antimicrobial properties, which help prevent growth of harmful bacteria.

and other microorganisms in the gut

Add diagrams

3. Excretion of Bilirubin and Cholesterol

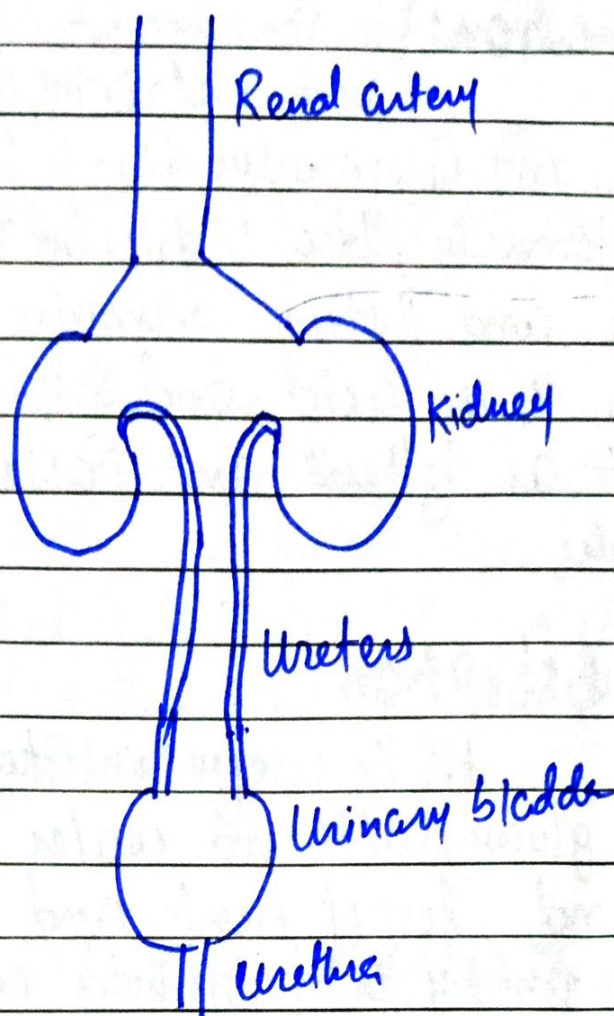
Bile juice also plays a role in the elimination of Bilirubin, a waste product, and help remove excess cholesterol from the body

PART B

Discuss the role of kidney in excretion

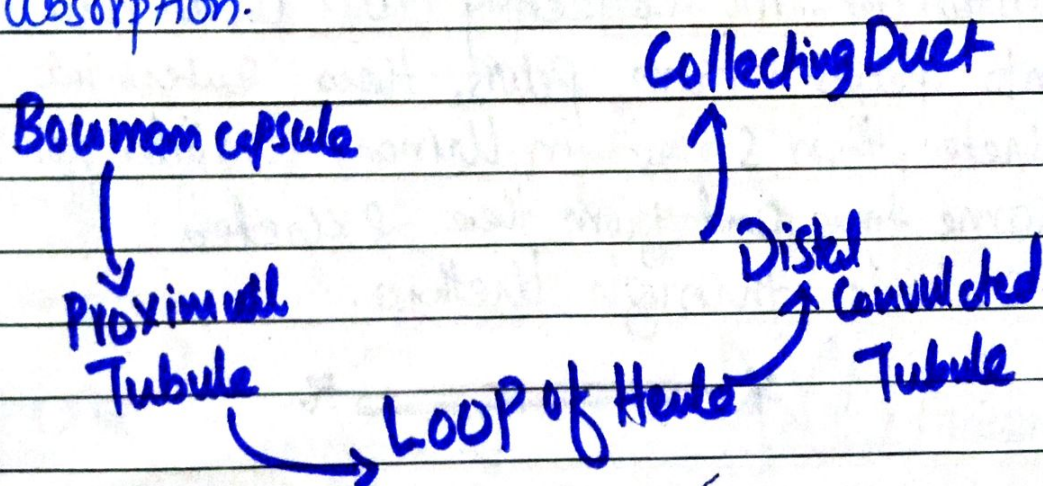
A pair of ^{bean-shaped} kidney is present in our body for the excretion of waste products. Its weight is less than 1% of the total weight of the body. 20% of the blood during each heartbeat is supplied to the kidney. Urine is produced by the kidney and it also contains the waste products of metabolism (salts, water, toxins) that end up in the blood. The kidney and urinary tract filter and eliminate these waste substances from our blood. Without the kidneys, waste products and toxins would soon build up in the blood of to dangerous levels.

HUMAN EXCRETORY SYSTEM



NEPHRON

The structural and functional unit of kidney Nephron helps remove waste products from the body. Nephron about 2 million tiny tubes has a well specialized structure to facilitate excretion along with secretion and absorption.



Make diagram of nephron to explain properly

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WORKING OF NEPHRON

1. Filtration:

Blood containing waste products enter into Glomerulus. Due to high blood pressure of Glomerulus, blood is filtered here. Blood cells and proteins remain while glucose, urea, uric acid and some important salts are filtered and passed to proximal tubule.

2. Reabsorption

All the useful constituents of filtrate like glucose, salts and water is absorbed in proximal loop of Henle and distal part of nephron by the peritubular capillaries

3. Secretion

The inner layer of nephron also secrete nitrogenous waste products into lumen of nephron.

4. Elimination

The waste products from the distal part ^{enter} into collecting duct which enter into pelvis. From pelvis, these enter into Ureter, then stored in Urinary bladder for some time and from there excreted outside through Urethra.

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PART C

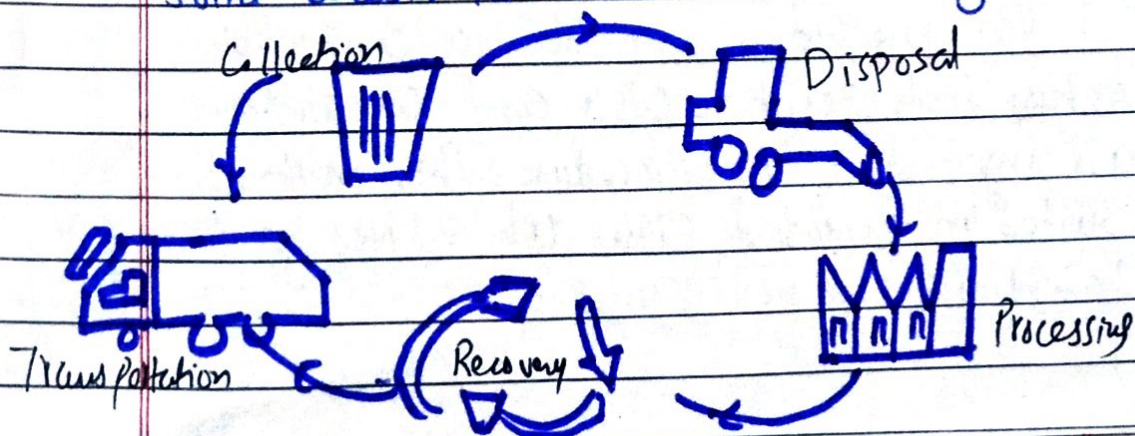
Discuss different methods of solid waste management

UNDERSTANDING THE WORD SOLID WASTE

Garbage arising from human or animal activities, that is abandoned as unwanted and useless is called solid waste. Generally, it is generated from industrial, residential, and commercial activities in a given area, and may be handled in a variety of ways.

SOLID WASTE MANAGEMENT

Solid waste management is a critical aspect of environmental hygiene. It refers to the process of collecting and treating solid wastes. The systematic management of the generation, collection, transfer, treatment, recycling, recovery and disposal of solid waste is solid waste management.



METHODS OF SOLID WASTE MANAGEMENT

a) Solid Waste Open Dumping

It is the open dumping of the waste as practised by the general public. However, in the present scenario of threatening climate change and global warming, it is not a suitable method and should be avoided.

b) Sea Dumping process:

This sea dumping can be carried out only in coastal areas. This is very costly procedure and not environment friendly.

c) Solid Waste Sanitary landfill

It is a simple, clean, and effective process in which layers are compressed with some mechanical equipment and covered with earth, levelled, and compacted. A deep trench of 3 to 5m is excavated and microorganisms act on the organic matter and degrade them.

d) Incineration method

This method is suitable for ~~combustible~~ refuse. High operation cost and construction are involved in this procedure. This method is suited in crowded cities where sites for landfilling are not suitable.

5. Composting process

Similar to landfilling, this method is popular in developing countries. Decomposable organic matter is separated and composted in this procedure. ~~Wastes~~ are stable and products ~~are~~ good soil conditioners. They can be used as base for fertilizers.

6. Salvaging procedure.

Materials such as metal, paper, glass, ~~logs~~, certain types of plastic and so on can be salvaged, ~~recycled~~ and reused.

Following these procedures can help to manage solid wastes.



Part D)

Define the terms

1. ANEMIA

Anemia is generally defined as loss of blood. It is a problem of not having enough healthy red blood cells or haemoglobin to carry oxygen to the body tissues. Haemoglobin is a protein found in red cells that carries oxygen from the lungs to ~~all~~ other organs in the body. Having anemia can cause tiredness, weakness, and shortness of breath.

ii) APPENDICITIS

Appendicitis is an inflammation of the appendix, which is a $3\frac{1}{2}$ inches-long tube of tissue that runs from large intestine on the lower right side of the body. Certain conditions can be the cause of appendicitis such as overgrowth of bacteria in ~~your~~ the intestine, hardened poop, colitis, or infection from parasites. It's a medical surgery which almost ~~requires~~ requires surgery to remove the appendix, however, even if it is removed, people can live fine.

iii) SPLEEN

Spleen is a part of lymphatic and blood system which is inside left rib cage, just above the stomach. It ~~helps~~ helps to filter the blood to destroy microorganisms and get rid of damaged red blood cells.

iv) MYOPIA

Also known as nearsightedness is an eye order. It is the condition in which near objects are seen clearly but distant objects are not seen clearly. It can be treated using ~~concave lens~~ concave lens.

v) ISOTONES Isotones are the atomic species that have the same number of neutrons.

but different number of protons.

Oxygen	${}^8_{16}\text{O}$	(p=8)	(n=8)
Nitrogen	${}^7_{14}\text{N}$	(p=7)	(n=7)
Oxygen	${}^8_{16}\text{O}$	(p=8)	(n=8)

QUESTION NOS

PART A

Pakistan is the fifth most populous country of the world. What are the causes of population explosion in Pakistan? What can be the control measures?

In 2023, the population of Pakistan was 240,485,658, while the current population of Pakistan as of July 2024 is 245,279,497. as per the reports of

"Worldometer United Nations Data". Pakistan previously on 6th position as the most populous country has now ~~ste~~ jumped to the fifth position which reflects that Pakistan population is increasingly at an alarmingly rate. Pakistan population equivalent to ~~2.99%~~ 2.99% of the total world population is

like a ticking bomb that can explode anytime

Population explosion is a bigger problem which gives birth to many other problems such as unemployment, sanitation problems, water and energy crisis, and environmental hazards.

CAUSES OF POPULATION EXPLOSION

a. ILLITERACY, CULTURAL TABOOS AND INACCESSIBILITY TO FAMILY PLANNING

The Population Council of Pakistan estimated:

35.4% of women in country are currently practising ~~contraception~~ and more than 70% of married women want to practice ~~contraception~~ to limit their family size but are unable to do so.

This is mainly because of widespread illiteracy, cultural ~~choice~~ taboos, and inaccessibility to high quality family planning. There seems to be some kind of aversion to this matter.

b) LIMITED CHOICE OF METHODS

In rural areas, there is shortage of modern contraceptive like condoms, pills and implants.

c) PATRIARCHAL SOCIETY

Pakistan is a patriarchal society where men often make decisions about family planning, and women may have limited autonomy about their own reproductive health.

d) RELIGIOUS CONSTRAINTS

Some religious groups in Pakistan deem family planning programs as against the tenets of Islam and therefore a forbidden act. Such religious constraints make it challenging for the government to implement effective population control policies.

CONTROL MEASURES

a) STRONG FAMILY PLANNING PROGRAMS

The government should make a commitment to treat this matter as top priority of the nation as it hampers the socio-economic development specially in poverty-stricken state like Pakistan, there is a wider need to address this issue. Family programs should enlighten the poor specially that bearing more children

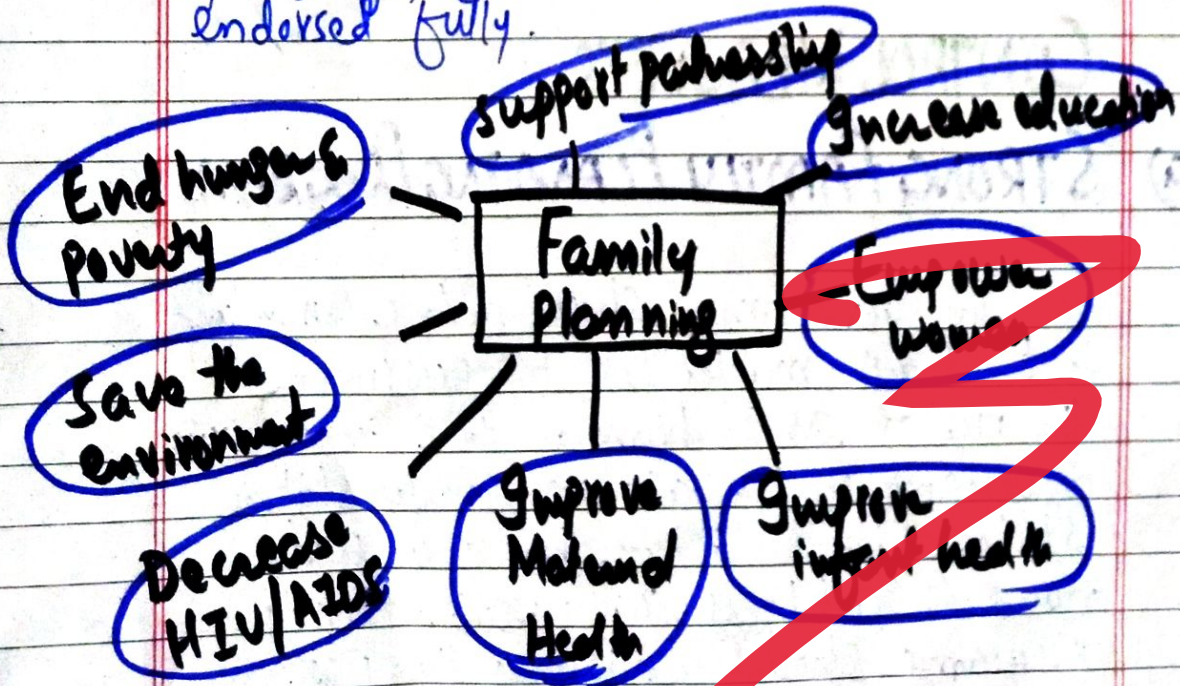
Will further afflict and ~~deteriorate~~ ^{exacerbate} their State of Poverty.

2. SETUP POPULATION PLANNING UNITS IN HEALTH SECTORS

All private maternity homes and health departments should set up Population Planning units on their premises as it is the duty of all private Commercial enterprises to protect the interest of society at large. Private media too should broadcast such programs.

3. ENDORSE CONTRACEPTIVE METHODS

These methods enable healthy living and spacing of pregnancies, and should be endorsed fully.



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Part B)

Differentiate b/w Cyclones and Tornadoes:
Which cyclone was observed in 2004

Natural disasters are a fact of life, and two of the most destructive and dangerous weather phenomena are Tornadoes and Cyclones. Although both are interchangeably used, they differ in terms of their location, formation, size, and their sp. life span.

Characteristics	Tornado	Cyclone
Location	Form overland	Form over warm ocean waters
Size	Small, usually a few hundred feet to a mile in diameter	Large, sometimes spanning hundred of miles in diameter
Frequency	More common in the US, but can occur in other parts of the world	Occur in tropical regions such as Indian & South Pacific Oceans
Associated hazards	Strong winds, heavy rain, hail, lightning & fabric debris	Strong wind, heavy rains, storm surges & flooding

CYCLONE IN 2024 TROPICAL "REMA" CYCLONE

In 2024, a tropical cyclone named "Rema Cyclone" was observed in North Eastern India and Bangladesh. The cyclone was observed from May 26 till May 28-2024.

CYCLONE DEVASTATION IN INDIA

In India 10 days after the cyclone Rema, ~~made~~ there had been random episodes of unseasoned rainfalls in the affected areas of Nagaland, Tripura, Manipur, and Meghalaya.

According to UNICEF Report, June 7, 2024

7 people have died, ~~100~~ people have been injured, more than 1400 camps relief camps are functional during the cyclone with 1,905, 032 people affected overall."

BANGLADESH CYCLONE CRISIS

According to Department of Disaster Management (DDM), under Ministry of Defense Disaster Management and Relief (MoDMR):

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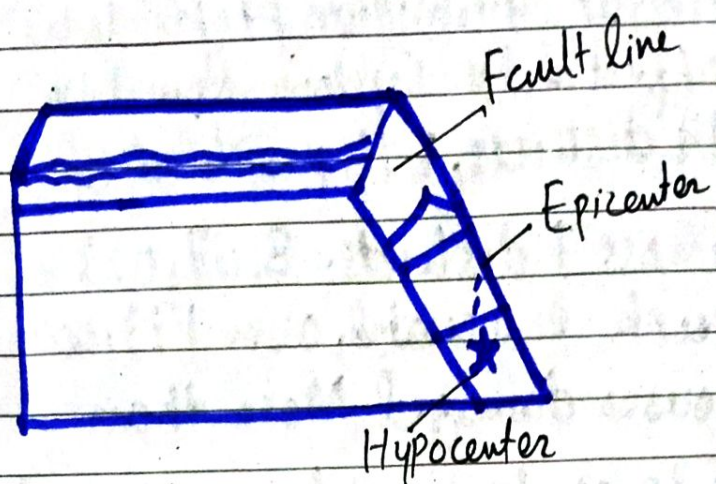
" About 4.6 million people were affected by Cyclone ~~Amphan~~ in 19 districts, 616 people died across 7 districts. 8,07,023 people evacuated, over 173,000 houses damaged. More than 530,000 farmers been affected by crop damage worth BDT 10,595 million"

Part c)

How earthquake occurs? How many people died in Turkey's earthquake in 2023? What was the intensity of earthquake on Richter Scale which jolted Turkey?

EARTHQUAKE

An earthquake is what happens when two blocks of earth suddenly slip past one another. The surface where they slip is called "Fault / Fault plane". The location below the Earth's surface where the earthquake starts is called "Hypocenter" and the location directly above it on the surface of the Earth is called Epicenter

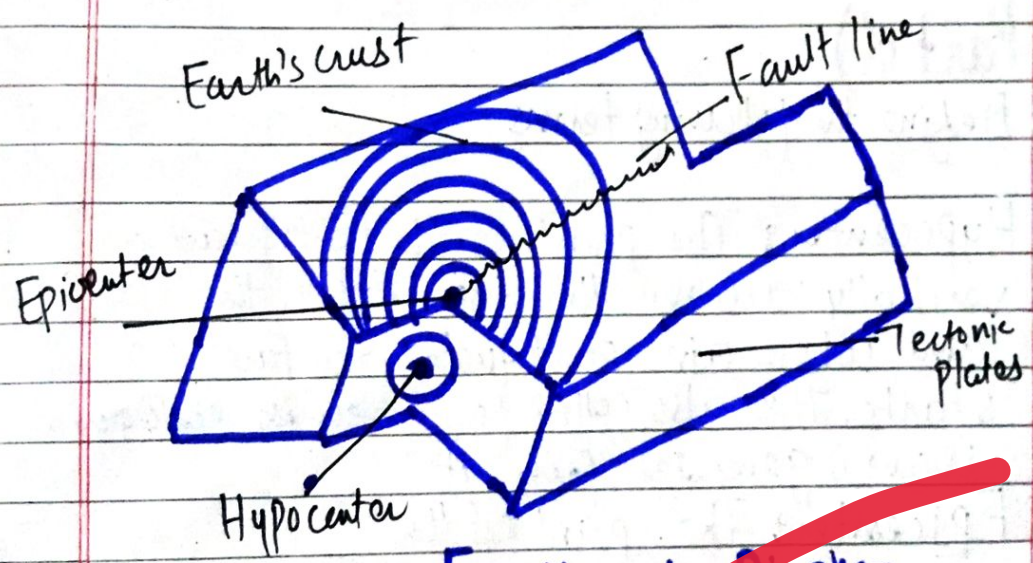


How EARTHQUAKE OCCUR?

The earth is composed of three layers, Core, Mantle, and Crust. The crust and top of the mantle make up a thin skin on the surface of our planet. Crust of the Earth is made up of huge blocks that fit together. These blocks keep slowly moving around and bumping into each other. They are called Tectonic plates, and the edges of the plates are called the Plate boundaries. The plate boundaries are made up of many faults, and most of the earthquakes around the world occur on these faults. Since the edges of the plate are rough, they get stuck while the rest of the plate keep moving. Finally, when the plate has moved far enough, the edges unstick on one of the faults and it causes earthquake.

Why does the Earth Shake?

The energy stored up which causes the blocks to slide past one another radiates outward from the fault in all directions in the form of "Seismic waves" like ripples on a pond. The seismic waves shake the Earth as they move through it and when the waves reach the Earth's surface, they shake the ground.



~~Earthquake Diagram~~

EARTHQUAKE IN TURKIYE

On Feb 6 2023, a magnitude 7.8 earthquake occurred in Southern Turkey near the northern border of Syria. It was followed by approximately 9 hours later by another earthquake of magnitude 7.5 located around 59 miles to the southwest

NUMBER OF CAUSALITIES

According to Wikipedia, death toll in Turkey earthquake was 53,537.

INTENSITY

- a) first shock = 7.8
- b) Second shock = 7.5 as recorded on Richter scales.



Part d)

Define the following terms

1. Hypocenter: The point on the Earth's surface vertically above the focus. It is the point where an earthquake rupture starts. It is also called focus because earthquake wave is generated from it.

2. Epicenter: The point at the

A point vertically above the focus on the surface of the Earth. It is the point where fault rupture commences, producing an earthquake.

3. Eye wall of the hurricane

The most dangerous and destructive part of a tropical cyclone is the hurricane eye wall. It is the most

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detracting region of hurricane. Most damaging winds and intense rainfall is found here

SECTION II: Ability portion

QUESTION 7: Part a)

Find the volume of a cylinder with radius 30cm and height 1m

Solution:

Radius = 30cm

$$\frac{30}{100} = \frac{3}{10} = 0.3m$$

Height = 1m

Formula of Volume of Cylinder = $\pi r^2 h$

Volume = $\frac{22}{7} \times (0.3)^2 \times (1)$

$\frac{22 \times 0.09 \times 1}{7}$

$\frac{22 \times 0.09}{7}$

$\frac{1.98}{7}$

Volume = 0.282m³

0.3
0.3
09
00x
0.09
22.0
0.09
22
018
018x
01.98

0.2826

Part B)

The average age of three boys is 15 years. If their ages are in the ratio 3:5:7.

What is the age of youngest boy?

7	1.98	0.282
14		
58		
56		
20		

Solution

Let the ~~ratio~~ be given ratio be n

$$3:5:7 \Rightarrow 3n \quad 5n \quad 7n$$

$$\text{Average} = \frac{3n+5n+7n}{3} = 15$$

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

$$45 = 15n$$

$$\frac{45}{15} = n$$

$$n = 3$$

age of youngest boy = 3×3
9 years

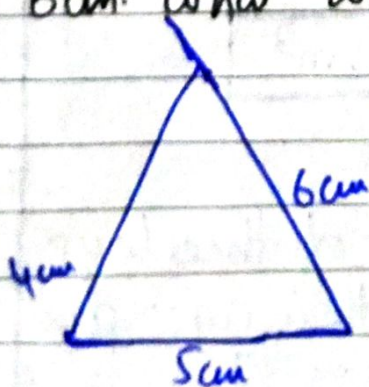
Hence, the age of youngest boy is 9 years.

part c) Identify the series

i) 8, 9, 52, 151, 447

ii) 11, 13, 17, 19, 23 what is wrong with this series?

part d) If a triangle has sides of 5cm, 4cm, and 6cm. What will be each angle?



Q6 part d)

Arrange the jumbled words

i) Teninsuperted

The correct word is "Superintended"

ii) Hweti

The correct word is "White"

