

Day: _____

GSAI Mock 1

Date: 30-7-2025

Name: Rafia LMS ID: 3907108071

Dos and Don'ts for the General Science & Ability Paper

Part-II

Section I

G.N. 3

Q.3a

Human Heart

Human Heart is a muscular organ that pump the blood through blood vessels by repeated contractions.

Structure:-

Human heart made up of cardiac muscles. Heart is enclosed in a sac is known as "pericardium". There is fluid called Pericardial fluid between pericardium and wall of heart to reduce the friction between pericardium and wall of heart during contraction and relaxation of heart.

Human heart consist of **four** chambers. Upper two chambers called **Atria** (left and right). Lower two chambers called **left and right Ventricles**.

Hithere — you've prepared well! Remember, knowing the content is one thing, but presenting it in the paper exactly as required is another. Here are a few key points to keep in mind:

1. For a 5-mark part, aim to write at least 2 and at most 3 sides of the answer sheet. Often, a question has two or three parts, and the marks are divided accordingly — so address each part fairly.

2. Manage your time wisely — you have about 35 minutes per full question, which comes down to around 8 minutes for each 5-mark part. Stick to this to avoid rushing later.

3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.

4. Neatness matters — keep your handwriting clean, avoid cutting or overwriting.

5. Mind your spelling and grammar — while GSA doesn't deduct marks for these, your expression leaves an impression.

6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

Good luck for CSS 2026 — you're going to ace it, in sha Allah! 🌟

Valves:-

There are four openings in heart that are called valves.

Tricuspid valve:-

The opening between right atrium and right ventricle.

Bicuspid valve:-

The opening between left atrium and left ventricle.

Aortic Semilunar valve

Present at the base of aorta, that prevent the backflow of blood from aorta to left ventricle.

Pulmonary Semilunar valve

At the base of pulmonary trunk, which prevent the backflow of blood from pulmonary trunk to right ventricle.

Function:-

Human heart function is double pump. It receives deoxygenated blood from body and pump it to lungs. At the same time, it

receives oxygenated blood from lungs and pump it to all body.

Deoxygenated Blood: Blood that contain more CO_2 and less O_2 .

Oxygenated Blood: Blood that rich in O_2 and less CO_2 .

Inside heart chamber the oxygenated and deoxygenated blood are kept separate

Mechanism:-

Right atrium receives the deoxygenated blood from body via Superior and inferior Vena Cava. When right atrium contracts it passes deoxygenated blood to right ventricles. Right ventricle contracts and pump the blood into Pulmonary trunk, that carry the deoxygenated blood to lungs. The oxygenated blood from lungs enter into heart by pulmonary vein to ~~right~~ left atrium. Left atrium passes blood to left ventricle. When left ventricle contracts it pump the

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blood to all part of body except
lungs via aorta.

Cardiac cycle:-

The relaxation of heart chambers fills them with blood. The contraction of chamber empty them. The alternation of relaxations and contractions make the Cardiac cycle.

One complete cardiac cycle make one heart beat

Cardiac cycle consists of two

steps (i)

~~(Systole (cardiac diastole) The~~

~~relaxation & filling of chambers~~

~~Atrial systole)~~

(i) Cardiac diastole

Atria and ventricles relax and blood fills in atria

ii) Atrial systole

Both atria contract and pump blood toward ventricles.

Blood pressure regulation

Heart regulate the blood pressure

by controlling the stroke (blood amount-pump per minute). Heart keep the blood pressure 120/80 mmHg in systole and diastole of cardiac cycle.

Q.No. 3b Biofuels

1 Define:- Biofuels are fuels produced from organic matter like plants or animal wastes

Examples: Ethanol, Biodiesel, Biogas

2) Production:- Biofuels are produced by plants and animals waste by various process. Plants waste include leaves, crops residue, animal waste include sewage and industrial waste. The production process involves:

Fermentation: Converting sugars from plants into ethanol by using Bacteria, fungi

Anaerobic digestion: Breaking down organic matter in the absence of oxygen e.g methane

Refining: Processing the biomass to extract and purify the fuel

3 Advantages & Disadvantages

Advantages:

- i) Biofuels are produced from renewable sources ✓
- ii) Release fewer greenhouse gases ✓
Some studies suggest potential reduction of upto 92%.
- iii) Biofuel reduce reliance on foreign oil & secure the energy ✓
- iv) Utilizing agriculture and other organic waste as feedstock can help to reduce the waste
- v) Biofuel produce less pollution than petrol or diesel ✓

Disadvantage

- i) Growing crops for biofuel production can compete with land and resources for food production ✓
- ii) Expansion of biofuel can lead to deforestation and habitat loss impacting the biodiversity
- iii) Some biofuel may have higher lifecycle carbon footprint ✓

Reducing the Green house Gas:-

By using biofuels in transportation and other sectors can directly reduce the associated emission because biofuels are considered as carbon neutral cycle because carbon released during combustion is balanced by the carbon absorbed during biomass growth.

Q.No. 3d

Structure of Earth interior

Earth consist of three main layers:

- i) The Crust ii) The mantle (iii) The Core

★ The **core** account for the almost half of earth's radius, but its amounts to only **16.1%** of Earth volume.

★ Most of Earth's volume is its

Mantle that is **82.5%**.

- ★ Only a small fraction is its **Crust**, that is **1.4%**.

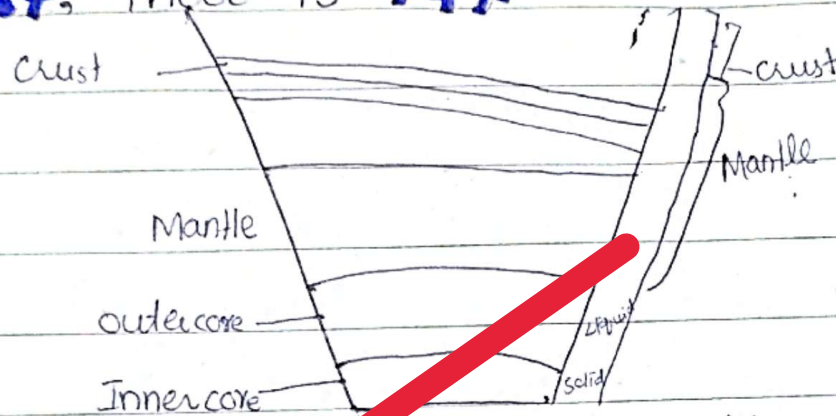


Fig structure of Earth

Oceanic and Continental Crust:-

oceanic	continental
1) ★ Thinner crust.	★ Thicker crust
★ Basic composition (rich in silica)	★ Felsic Composition (richer in silica)
★ High density	★ Lower density
★ Float less than the continental crust	★ Floats higher in the mantle

Tectonic plates Shape the earth surface:-

Tectonic plates are composed of the crust and uppermost part of the mantle collectively known as lithosphere.

Tectonic plates shape earth's surface by driving the movement of continents, creating mountains and ocean trenches and causing earthquakes and volcanic eruptions.



Section II

Q. No. 5a

Given data

$$= \text{No. of students of 8 years of age} = 48$$

$$= \text{No. of students of above 8 years} = \frac{2}{3} \times 48$$

$$= \frac{2}{3} \times 48 = 32$$

$$= \text{No. of students of 8 years or above} =$$

$$= 48 + 32 = 80$$

These 80 students represent

$$100\% - 20\% = 80\% \text{ of students as}$$

20% are of age below 8 years

So total number of students

$$\text{in school} = \frac{80}{0.80} = 100$$

There are **100** students in school

Q # 5b

Let Father age is y and Rashid age is x

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

$$\text{After 8 years} \quad y + 8 = 2.5(x + 8) \quad \text{--- (ii)}$$

Substitute the value of y into eqn (ii)

$$3x + 8 = (2.5)(x + 8)$$

$$= 3x + 8 - 2.5x + 20$$

$$3x - 2.5x = 20 - 8$$

$$0.5x = 12$$

$$x = \frac{12}{0.5} = 24$$

$$\text{Rashid's age} = 24$$

$$y = 3x$$

$$\text{Father's age} = y = 3 \times 24$$

$$y = 72$$

After further 8 years (total 16 years from present):

$$\text{Rashid's age} = 24 + 16 = 40$$

$$\text{Father's age} = 72 + 16 = 88$$

Q # Sc

When 2 dice tossed total outcomes = $6 + 6 = 36$

Prime number are = 2, 3, 5, 7, 11

Total combination for each prime sum:

Sum of 2 = (1,1) - 1 Combination

Sum of 3 = (1,2), (2,1) - 2 "

Sum of 5 = (1,4), (4,1), (2,3), (3,2) - 4

Sum of 7 = (1,6), (6,1), (2,5), (5,2), (3,4), (4,3) - 6

Sum of 11 = (5,6), (6,5) - 2 Combination

Total favorable combination

$$1 + 2 + 4 + 6 + 2 = 15$$

Probability = $\frac{\text{no. of favorable outcome}}{\text{total possible outcome}}$

$$\frac{15}{36} = \frac{5}{12}$$

There is $\frac{5}{12}$ probability for each prime number score.

Q # 5d:

Let average age of whole team
is = x

Age of captain = 26 years

Age of Wicket keeper = 26 + 3 years = 29

Sum of captain & WK ages = 26 + 29 = 55 years

Total age of whole team = ~~No. of players~~

$$= \text{No. of players} \times \text{Avg of team}$$

$$= 11x$$

~~Average age of remaining players~~

$$= \frac{\text{Total age of remaining players}}{\text{No. of remaining players}}$$

$$\text{No. of remaining players} = 11 - 2 = 9$$

$$\text{Avg age of " " " " } = x - 1$$

$$\text{Total age of " " " " } = 9(x - 1)$$

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Total age of whole team = sum of age of all players

$$11x = 55 + 9(x-1)$$

$$11x = 55 + 9x - 9$$

$$11x - 9x = 46$$

$$2x = 46$$

$$x = 23$$

Avg of whole team = 23.

Q # 6a

Selling price = SP = 2SP

Profit = 3P

Profit % = ?

AS

CP = cost price

$$P = SP - CP \quad - (i)$$

$$3P = 2SP - CP \quad - (ii)$$

put the value of P into eqn ii

$$3(SP - CP) = 2SP - CP$$

$$3SP - 3CP = 2SP - CP$$

$$3SP - 2SP = 3CP - CP$$

$$SP = 2CP$$

Put the value of SP in eqn (i)

(1)

$$P = 2CP - CP$$

$$P = CP \quad \text{--- (ii)}$$

$$\text{profit percentage} = \frac{\text{Profit}}{\text{Cost price}} \times 100$$

$$\text{as in eq, } P = CP \text{ so}$$

$$= \frac{CP}{CP} \times 100$$

$$\text{Profit\%} = 100\%$$

6B

$$\text{Let } X's \text{ pay} = x$$

$$Y's \text{ pay} = y$$

$$x + y = 550 \quad \text{--- (i)}$$

$$X \text{ is paid } 120\% \text{ of } Y: X = \frac{120y}{100}$$

$$x = 1.20y$$

put x value into eq i

$$1.20y + y = 550$$

$$2.20y = 550$$

$$y = \frac{550}{2.20} = 250$$

$$x = 1.20(250)$$

Y paid $\neq$ 250 rupees per week

