

Do's and Don'ts for the General Science & Ability Paper
Hi there — 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:

GENERAL SCIENCE AND ABILITY.

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.
(Q) - Data is the new oil. Do you agree? Justify with simple examples.
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.
Data is extremely valuable because it helps people, companies, and governments make better decisions, predict trends, and improve lives.
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.
In the modern digital era, data has become one of the most valuable resources. Similar to how oil was during the industrial revolution, the phrase "Data is the new oil" highlights the data now fuels the global economy, technological progress, and decision-making.

Here's a brief key/sample of your Ability questions:

Q.6 is the new oil" highlights the data now

a) Candy ratio problem

Given: Packets in flavors Apple : Berry : Cherry : Date = 3 : 6 : 2 : 5.

Asked: If Apple candies exceed Date candies by 35, how many Berry candies are there?

Industries, data powers today's tech prob- gives such as Artificial Intelligence (AI)

Note (consistency check): The ratio shows Apple = 3 parts

Machine Learning, and Big Data Analytics. It is extracted, refined and used to produce valuable outcomes exactly like oil must be refined before it becomes useful.

Data is so valuable in decision-making. Power: Governments, businesses, and organizations rely on data to understand public needs, plan policies, and make evidence-based decisions.

Economic Growth.-

Companies like Google, Amazon, and Meta build their wealth primarily through data - by analyzing ~~their~~ user behavior and selling targeted advertisements.

Technological Development-

Data drives innovation in automation, robotics, health sciences, and even climate prediction models.

Every day examples-

1. Social Media.-

Platforms like Facebook and Instagram analyze user data to personalize

news feeds and advertisements.

E-commerce -

Website such as Amazon - or Daraz collect shopping data to recommend products and improve customer experience.

Smartphones & Navigation -

Applications like Google Maps use user's location data to provide real-time traffic updates and the shortest travel routes.

Q NO 2:-

(1) What do you mean by a balanced diet?

Let the food be the medicine.

A balanced diet is the one that contains adequate proportions of food from five groups of food as a supply essential nutrients in complete fulfilment of the requirements of body.

The basic five groups include the milk, meat beans and pulses, green leafy vegetables and cereal group.

- From all the above groups we expect to achieve proteins, fats, carbohydrates, water, minerals, vitamins and fibers.
- Milk, meat, beans, fruits, vegetable, cereal, fats, proteins, carbohydrates, water, fiber, minerals and vitamins.

How to plan Balanced Diet:-

- Age, Sex, and Calories requirement (pregnant and lactating women and children suffering from malnutrition. Due to deficiency of food be given more calories than peers.
- Food must be selected from all five basic groups.
- Economic status of person be kept in mind. Food which is cheap, makes balanced food is locally available should be used.

• Vitamins:-

A vitamin is an organic molecule, an essential micronutrient that an organism needs in small quantities for the proper functioning of its metabolism.

Their absence can lead to deficiency.

diseases.

Vitamins can be classified on the basis of being water soluble and fat soluble.

Deficiency of vitamins and their effects-
Vitamin A deficiency:-

Cause night blindness, dryness of eyes (xerophthalmia), and may lead to complete blindness if prolonged.

This cannot be synthesized by body.
Its deficiency causes myocardial infarction, angina attack. Neck, arms, jaw and back chest pain, shortness of breath.

Vitamin D deficiency:-

It can be synthesized by human body.

Leads to rickets in children (soft, weak bones and deformities).

In adults causes osteomalacia or osteoporosis, resulting in bone pain and fragility because calcium absorption decreases.

Vitamin E Deficiency

It cannot be synthesized by body. May cause muscle weakness, nerve damage, and reproductive problems. It also reduces the body's ability to fight oxidative stress, since vitamin E is an important antioxidant.

Q NO. 4.

(c) Discuss different methods of Solid Waste Management.

"Solid waste" are the discarded leftovers of our advanced consumer society. This growing mountain of garbage and trash represents not only an attitude of indifference toward valuable natural resources, but also a serious economic and public health problem.

Any refuse or waste material, including semi sludge, produced from domestic commercial, or industrial premises or processes including mining and agricultural operations and water treatment plants. Solid Waste Management (SWM) refers

to the Systematic management of the generation, collection, transfer, treatment, recycling, recovery and disposal of Solid waste.

Main methods of Solid waste Management

• Open Dumping:-

Involves throwing waste in open lands or pits.

It is cheap but unhygienic, causes foul smell, pollution and attracts pests.

Now considered environmentally unsafe and discouraged.

Land-filling:-

Waste is buried in the ground in a Scientifically engineered manner.

Modern Sanitary landfills have layers of clay and plastic liners to prevent leachate (toxic liquid) from contaminating groundwater.

It is a commonly used and controlled disposal method.

Incineration (combustion).

Involves burning solid waste at high

temperatures to reduce its volume.

Generates heat energy, which can be used for electricity (waste-to-energy plants).

However, it can cause air pollution if not properly managed.

Composting.

A biological process that converts organic waste (like food, leaves and paper) into nutrient-rich compost.

The compost is used to improve soil fertility.

It can be eco-friendly and cost-effective method for biodegradable waste.

Recycling:-

Involves processing and reusing materials like paper, glass, metals and plastics.

Reduces demand for raw materials and energy consumption.

Promotes sustainable waste management.

Waste-to-Energy conversion:-

Technologies like biogas production

or pyrolysis convert waste into usable energy (gas, electricity or fuel). Helps reduce landfill waste and generate renewable energy.

Source Reduction / waste minimization

Focuses on reducing waste generation at its source by changing production, packaging, and consumption habits.

Example: Using reusable bags, eco-friendly packaging, and digital documentation.

Effective solid waste management requires a combination of methods, along with public participation and government regulation. Adopting techniques like recycling, composting and energy recovery ensures environmental protection, resource conservation, and sustainable development.

Q No 4:-

(d) Define the terms:

Biofuel.

Biofuel is a type of renewable energy.

derived from biological sources such as plants, animal waste or algae.

Biofuels are fuels produced from organic matter (biomass) that can be used as an alternative to fossil fuels like petrol and diesel.

Common examples of Biofuels:-

Ethanol:-

Made from sugarcane, corn, or wheat
Used as a blending agent with petrol to form gasohol.

Biodiesel:-

Produced from vegetable oils, animal fats or algae.

Used in diesel engines as a cleaner substitute.

Biogas:-

Formed by anaerobic decomposition of organic waste like animal manure or food waste.

Used for cooking, heating, and electricity generation.

Definition of Adulteration:-

Adulteration means mixing or adding inferior, harmful, or unnecessary substances to food, drink, or other products making them impure and unsafe for use. It reduces the quality, purity and safety of a product.

It is often done intentionally to increase profit by using cheaper substances.

Adulterated food can cause serious health problems, such as food poisoning, organ damage, or long term diseases.

Examples:-

Mixing water in milk to increase quantity.

Adding coloured chemicals to spices (like turmeric or chili powder) to make them look fresher.

(iii) Hydrosphere:-

Define:-

The hydrosphere refers to all the water present on, under, and above the surface of the earth.

It includes oceans, seas, rivers lakes glaciers, groundwater, and water vapor in

the atmosphere.

The hydrosphere covers about 71% of the earth's surface and plays a vital role in maintaining climate balance, weather patterns and supporting life.

Oceans and seas contain about 97% of earth's water.

Ice and glaciers store around 2% of water in frozen form.

Rivers, lakes, and groundwater less than 1% but essential for human use.

Troposphere:-

It is the lowest layer of the Earth's atmosphere, where all weather phenomena (like rain, clouds, storms and winds) occur.

It extends from earth's surface up to about 8 to 18 kilometers high - thicker at the equator and thinner at the poles.

The air is densest in this layer, containing about 75% of the total atmospheric mass and most of the water vapor.

The upper boundary of the troposphere is called tropopause - which separates

it from the next layer — the stratosphere.

Contains oxygen and nitrogen essential for life.

4 Isotopes: -

Definition -

Isotopes are variants of a chemical element that have the same number of protons but different numbers of neutrons in their nuclei.

Because isotopes of an element have the same number of protons, they belong to the same element and have similar chemical properties.

However the difference in the number of neutrons means that isotopes have different atomic masses.

Carbon isotopes Carbon 12 (^{12}C) The most common isotope, with 6 protons and 6 neutrons.

Carbon 14 (^{14}C) - Has 6 protons and 8 neutrons, and it is used in radiocarbon dating.

Hydrogen Isotopes

Protium (^1H) The most common with 1 proton and 0 neutrons.

Q No 8:-

(c)

A rectangular box. $8\text{m} \times 6\text{m} \times 4\text{m}$

Surface Area.

$$= 2(lw + lh + wh)$$

$$= 2(8 \times 6 + 8 \times 4 + 6 \times 4) = 2(48 + 32 + 24)$$

$$= 2(104) = 208\text{ m}^2.$$

Volume.

$$= l \times w \times h = 8 \times 6 \times 4 = 192\text{ m}^3.$$

(d)

Family of 8 $\rightarrow$ 4 men, 4 women

$$\text{Men eat} = 72\text{ kg avg} \rightarrow 4 \times 72 = 288\text{ kg}$$

$$\text{Women eat} = 50\text{ kg avg} \rightarrow 4 \times 50 = 200\text{ kg}$$

$$\text{Total} = 288 + 200 = 488\text{ kg}$$

Amna joins, new total = 9 people.

$$\text{New avg} = 67 \rightarrow \text{Total} = 67 \times 9 = 603\text{ kg}$$

$$\text{So Amna ate} = 603 - 488 = \boxed{115\text{ kg}}$$

Q No 6:-

(c) Distance = 36 km

Speed = 18 km/h

Start time = 1:00 PM

Time = $\frac{\text{Distance}}{\text{Speed}}$

Time = $\frac{36}{18} = 2 \text{ hours}$

Add Time to start time.

1:00 PM + 2 hours = 3:00 PM

(d),

STATISTICS →
STATISTICS

Definition: The branch of mathematics dealing with the collection, analysis, interpretation, presentation and organization of data.

(ii) ALGEBRA.

ALGEBRA

The branch of mathematics dealing with symbols and the rules for manipulating those symbols.