

Dos 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:

Fibre optic cable (FOC)

Fibre optic cable is the transmission medium that transfers data at high speed. It uses light signals to carry information through the thin strands of plastic or glass.

3. 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.

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

Address all parts

Core
Cladding
Coating
Strength member
Outer Jacket

High-speed data transmission

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! 🌟

at an angle greater than the critical angle, it reflects back into the core. This keeps the light signals trapped within core, allowing long-distance travel with minimal loss of light.

Advantages of FOC

1. It is less susceptible to theft than the copper wire.
2. It has better electromagnetic immunity that ensure stable flow of data transfer than the copper wire.
3. It is more durable and resist corrosion and temperature variations.

It facilitate the fast and long-distance data transmission without an amplifier.



Date _____

Add definition

Earthquake occurs due to the release of seismic wave that creates vibration in the crust.

A) Causes of Earthquake

(1) The abrupt movement of the tectonic plates create earthquake. The earth's crust is divided into tectonic plate that are in continuous movement.

(i) They may move away from each other and create the divergent fault line.
e.g The Fuc of Wall

(ii) They may slide over each other and form convergent fault line e.g The Peru-Chile Trench

(iii) They may rub each other and produce dangerous earthquakes. It is called transformative fault lines.

(2) The heat in earth's core causes hot magma in the mantle to rise and cool magma to sink. This circular movement creates the pressure beneath

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the earth's surface and triggers an earthquake or volcanic eruption

3. Human activities such as nuclear explosion, mining and deep drilling can also disrupt the underground structure of earth and cause the shaking of the earth.

B) Effects of Earthquake

- ① An earthquake has the following devastating effects on human, economy, environment and infrastructure.
- ② A huge loss of life and injuries due to collapse of large buildings and houses.
- ③ The destruction of roads, bridges and communication infrastructure which lead to business activities shut down.
- ④ The change topography of the earth due to the eruption of volcanoes, wildfires and oceans.

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④ An earthquake in the sea can trigger Tsunami.

examples

The 7.8 magnitude earthquake that hit Turkey and Myanmar badly is the manifestation of devastating impact of earthquake.

⑤ Seismic Waves

There are two types of seismic waves

1. Body Waves that travels from the earthquake focus to all directions. They are faster than surface waves.
2. Surface waves travel around the earth, not through it. They are slower than body waves.

Seismograph

Seismograph is an instrument that detect the vibration caused by seismic waves and measure them.

D) Effectiveness of Preparedness:-

- Earthquake-resistant construction such as base isolation, dampening & dissipator the energy and ensures stability against shaking.
- Earthquake-related preparedness measures such as risk zoning of areas, public awareness campaigns, early warning systems installation and emergency evacuation drills in schools and colleges reduce the life and economic loss significantly.

~~(C)~~

A) Balanced Diet

A balanced diet contains the food from five basic groups for the purpose of achieving micro- and macro nutrients. It includes the groups: Milk & dairy, Meat, Fish, Poultry, Beans & Pulses and Nuts, Cereals, Vegetables and fruits.

B) Importance of a balance diet

"Let thy food be thy medicine"
(Hippocrates)

An intake of unbalanced diet can result in malnutrition and many chronic diseases and illnesses. A balanced diet has following health benefits for us.

- 1- It supports the growth and development.
- 2- It supplies energy for day-to-day activities.
- 3- It strengthens immunity to fight against diseases.
- 4- It prevents from chronic diseases like heart attack, obesity and diabetes.
- 5- It ensures hydration and detoxification of body substances.

C) Importance of Micro-Macro Nutrients

- * Micro-nutrients includes vitamins, minerals, fats, fibre and water. They are important for following functions.

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- (i) They improve metabolism and helps in digestion
- (ii) They are critical in the formation of blood cells, hormones and neurotransmitters.
- (iii) They act as antioxidants for the cells
- (iv) Their deficiency can result in anaemia, osteoporosis, Beri-Beri, goitre and scurvy.
- (v) They trigger thousands of chemical reactions in the body and maintain acid-base balance.

* Macro-nutrients include carbohydrates and proteins that are important for following functions.

- 1) They supply instant energy.
- 2) They store excess glucose as glycogen for future use of energy.
- 3) They form the structural part of DNA and RNA molecules.
- 4) The carbs and proteins together form surface antigen and molecules receptors.
- 5) They facilitate biological transport.

through cell-to-cell communication



A) Water Pollution

Water pollution is the contamination of water bodies with physical, chemical and biological pollutants. It degrades the quality of drinking water and adversely affect the human health and environment.

Add diagram for sources

B) Sources of Water Pollution

Organic pollutants such as pesticides, food waste and detergents

- ① Organic sources include municipal waste, agricultural runoff and food waste.
- ② Inorganic sources include chemical and fertilizer industry and mining activities.
- ③ Pathogens or biological pollutant enters the water bodies through sewage and faecal waste.

c) Effects of Water Pollution

- 1) Water pollution promotes the spread of water-borne ~~disease~~ like diarrhoea, cholera and typhoid.
- 2) It alters the pH level of water. The excess of nitrates in water can cause "Blue Baby Syndrome".
- 3) It increases biological-oxygen demanding pollutants quantity that disrupt the marine ecosystem.
- 4) The bioaccumulation of heavy metals with fish tissue can cause lead-neurological damage.

d) Prevention

① Wastewater treatment before discharge using advanced methods like UV, ozonation and membrane filtration, can prevent water pollution.

② Waste reduction at domestic and commercial level using 3R's strategy can be beneficial. It consists of Reduce, Recycle and Reuse.

③ The enforcement of policies to prevent industries from discharging wastewater without treatment.

④ Encouraging public and community participation to prevent water pollution.

Conclusion

In a nutshell, Water Pollution is a serious issue that is adversely affecting human health and environment. According to Ministry of Climate Change in Pakistan the 80% of water available is unsafe for drinking and caused 100,000 child deaths annually. Globally, two billion people lack access to safe drinking water as per United Nations Organisation.

~~Cell~~

Cell

A cell is the basic unit of life. All living things are made up of cells. It is tiny and cannot be seen with the naked eye.

Components of Cell

Every cell consists of three main components and other specialised ones.

- 1- Cell membrane
- 2- Cytoplasm
- 3- Nucleus
- 4- Cell organelles

Cell membrane

A Cell membrane is a thin, flexible layer surrounding the cell. It controls the movement of substances in and out of the cell. It maintains and protects the cell shape.

Diagram?

Cytoplasm

A cytoplasm is a jelly-like fluid inside the cell. It fills out the space between the cell membrane and nucleus. It holds organelles where many chemical reactions occur.

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Nucleus

Difference?

A nucleus is the control centre of cell. It is irregular or spherical in shape. It contains DNA which carries genetic instructions. It controls the cell's growth, reproduction and life activities.

Cell Organelles

A Cell also have organelles that perform specialised functions. It includes mitochondria that supplies energy and called the Powerhouse of the cell. Ribosomes are protein and endoplasmic reticulum facilitates transportation of energy. In plant cell, there are another component which include cell wall, vacuoles and chloroplasts.

Q.2 

Air Pollution

Air pollution is the contamination of air with harmful toxic substances that make the air unsuitable for breathing.

Add diagram for sources/causes

Causes of Air Pollution

- (1) The emissions from vehicles release carbon dioxide, carbon monoxide, sulphur dioxide into the air.
- (2) The combustion of fuel such as coal, petroleum and gas for energy production also contributes in air pollution.
- (3) The use of deodorants, paints, pesticides release CO_2 and NO_2 in air.

- 4) Cutting down trees reduced the tree cover and natural filtering of toxic air.

Effect of Air Pollution

- 1) Air pollution can cause many respiratory and heart diseases such as asthma and heart attack. The World Health Organisation (WHO) linked the rise of heart attack with air pollution in the South Asia.
- 2) The concentration of greenhouse gases in the atmosphere resulted in global warming and extreme weather events.
- 3) The pollutants such as nitrous oxide (N_2O) and Sulphur oxide (SO_2) in the atmosphere combines with other elements. This process alters the pH level of water that fall on the earth as Acid rain.
- 4) Air pollution can also cause smog. It makes the air unbreathable, reduces visibility and lead to road accidents. The smog in Lahore caused the closure of schools, markets and offices. It adversely affected the health of Lahoreis also.

Primary and Secondary Pollutants

The primary pollutants are naturally occur pollutants such as carbon dioxide (CO_2), Sulphur oxide (SO_2) etc.

- * The secondary pollutants are those which are formed as a result of chemical reaction that natural substances undergo. e.g Smog
- $$\text{Fog} + \text{SO}_2 / \text{NO}_2 / \text{PM} = \text{Smog}.$$

Adaptation and Mitigation efforts

- ① Promoting the transition toward renewable energy resources for transportation and energy production. For example, electric cars and bikes and hydroelectricity.
- ② Reforestation and afforestation to increase the natural^{air} filtration capacity of the earth.
- ③ Enforcing strict laws and policies to restrict industries from releasing polluted air without treatment.
- ④ Using public transport, energy saving LED lights, solar plants to reduce use of fuels and ultimately air pollution.
- ⑤ The Government should install advanced technologies to treat air pollution. Similar to the Govt. of Punjab that installed 'Smog Tower' in Lahore last year to tackle extreme smog conditions there.

Q 06

Date _____

1

(a)

Let the 1st number = a and 2nd = b ,

So

$$ab = 120 \text{ — eq (1)}$$

$$a^2 + b^2 = 289 \text{ — eq (2)}$$

Using formula; we get

$$a^2 + b^2 = (a+b)^2 - 2ab$$

$$289 = (a+b)^2 - 2(120)$$

$$289 = (a+b)^2 - 240$$

$$(a+b)^2 = 240 + 289$$

$$(a+b)^2 = 529$$

Taking Root both sides, we get

$$\sqrt{(a+b)^2} = \sqrt{529}$$

$$a+b = 529 \text{ — eq (3)}$$

Sum of two numbers = 529

$$\begin{array}{r}
 26 \\
 26 \\
 \hline
 189 \\
 189 \times \\
 \hline
 079 \\
 326 \\
 \hline
 26 \\
 \hline
 156 \\
 452 \\
 \hline
 676 \\
 23 \\
 \hline
 23 \\
 \hline
 69
 \end{array}$$

~~200~~ ~~200~~

Let 1st = x , 2nd = y , 3rd = z

$$x + y + z = 498$$

$$x : y : z$$

$$2 : 3 : 3$$

$$5 : 5 : 8$$

$$10 : 15 : 24$$

$$10a : 15a : 24a$$

Sum of the ratio = ~~49~~ Add given, asked, solution, answer

$$498 = 49a$$

$$a = \frac{498}{49} \approx 10.16$$

$$a = 2$$

So the 2nd number is:

$$y = 15a$$

$$y = 15(2)$$

$$y = 30$$

So the number is "24".

Q6 ~~ed~~

Selling Price = C.P. + Profit

Since profit = 22.5% of C.P., write it as 0.225 C.P.

$$392 = \text{C.P.} + 0.225$$

$$392 = 1.225 \text{ C.P.}$$

$$\frac{392}{1.225} = \text{C.P.}$$

$$320$$

$$\text{C.P.} = \frac{392 \times 100}{122.5} = \frac{39200}{122.5} = \frac{15680}{49} = \frac{2240}{7} = 320$$

$$[\text{C.P.} = 320]$$

$$\text{So, Profit} = 22.5\% \times 320$$

$$[\text{Profit} = 72]$$

$$\begin{array}{r} 64 \quad \text{✓} \\ 6.4 \\ 1.6 \\ \hline 8.0 \end{array}$$

Rainbow

Teacher's Sign. _____

Q 7 (a)

Date _____

$$\text{Let } U = T + 2$$

$$T = 10T \text{ (10 times contribution)}$$

$$\begin{aligned}\text{The number} &= U + T \\ &= 10T + T + 2 \\ &= 11T + 2\end{aligned}$$

$$\begin{aligned}\text{Sum of digits} &= U + T \\ &= T + 2 + T \\ &= 2T + 2\end{aligned}$$

$$(11T + 2) \times (2T + 2) = 144$$

$$22T^2 + 22T + 4T + 4 = 144$$

$$22T^2 + 26T + 4 = 144$$

$$22T^2 + 26T - 140 = 0 \quad \text{--- eq.(1)}$$

Solve the quadratic equation

$$a = 22, \quad b = 26, \quad c = -140$$

$$T = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-26 \pm \sqrt{(26)^2 - 4(22)(-140)}}{2(22)}$$

$$= \frac{-26 \pm \sqrt{676 + 12320}}{44}$$

$$= \frac{-26 \pm 114}{44}$$

$$= \frac{-26 + 114}{44}, \quad \frac{-26 - 114}{44}$$

$$\boxed{T = 2}$$

Rainbow

-3-18-

not a valid root value

Date _____

If $T = 2$, then

$$U = T + 2$$

$$U = 2 + 2$$

$$U = 4$$

To Verify

$$(2 \times 4) \times 24 = 144$$

$$8 \times 24 = 144$$

$$\boxed{144 = 144}$$

So the number is "24".

Q 7

Date _____

(6)

(i) 53, 53, 40, 40, 27, 27, 14
0 -13 0 -13 0 -13

(ii) 14, 28, 20, 40, 32, 64, 56
x2 -8 x2 -8 x2 -8

(iii) 8, 6, 9, 23, 27

Explain in words

(iv) B, F, R, 54
2 6 18
x3 x3 x3

$$54 - 26 = 28$$

$$28 - 26 = 2$$

(v) V, U, W, V, X, Y
22, 21, 23, 22, 24, 23, 25
-1 +2 -1 +2 -1 +2

$$a = 0.03$$

Q7 (c)

$$0.2a = b \text{ — eq 1}$$

$$0.2b = x\% \cdot a \text{ — eq 2}$$

Put eq 1 into eq 2

$$0.2b = x\% \cdot a$$

$$0.2(0.2a) = x\% \cdot a$$

$$0.04a = x\% \cdot a$$

$$\frac{0.04a}{a} = \frac{x\%}{1}$$

$$x = 0.04\%$$

So $0.2b = 0.04a$

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Q7 (d)

Date _____

Let the son's age = x

10 years ago

$$\text{Son} = x - 10 = x - 10$$

$$\text{Father} = 3(x - 10) = 3x - 30$$

10 years hence

$$\text{Son} = 2(x - 10) + 10$$

$$\text{Father} = 3x + 10 - 30$$

$$\text{Son} = \text{Father}$$

$$2x - 20 + 10 = 3x + 10 - 30$$

$$2x - 10 = 3x - 20$$

$$2x = 3x - 30$$

$$x = 30$$

$$\begin{array}{l} \text{Son} = 30 \\ \text{Father} = 3(30) - 30 + 10 \end{array} = \frac{30}{70} = \frac{3}{7} \text{ Ans.}$$