

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:

Function of Heart:

Heart is a fist-sized organ that pumps oxygen-rich blood to the body and oxygen-poor blood to the lungs. Every day it pumps about 2000 gallons of blood, beating about 100,000 times.

Structure of Heart:

Human heart consists of four chambers. The upper two chambers are receiving chambers of blood while lower two chambers left ventricle and right ventricle are pumping chambers of blood. A thin wall of tissue called septum separates the oxygenated and deoxygenated blood in heart. Four valves prevent blood from flowing backwards during circulation. They open easily in the direction of blood flow but close backwards they close. Two valves located between atria and ventricles are called tricuspid and bicuspid valve. The other two valves located between ventricles and arteries are aortic valve and pulmonary valve.

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.

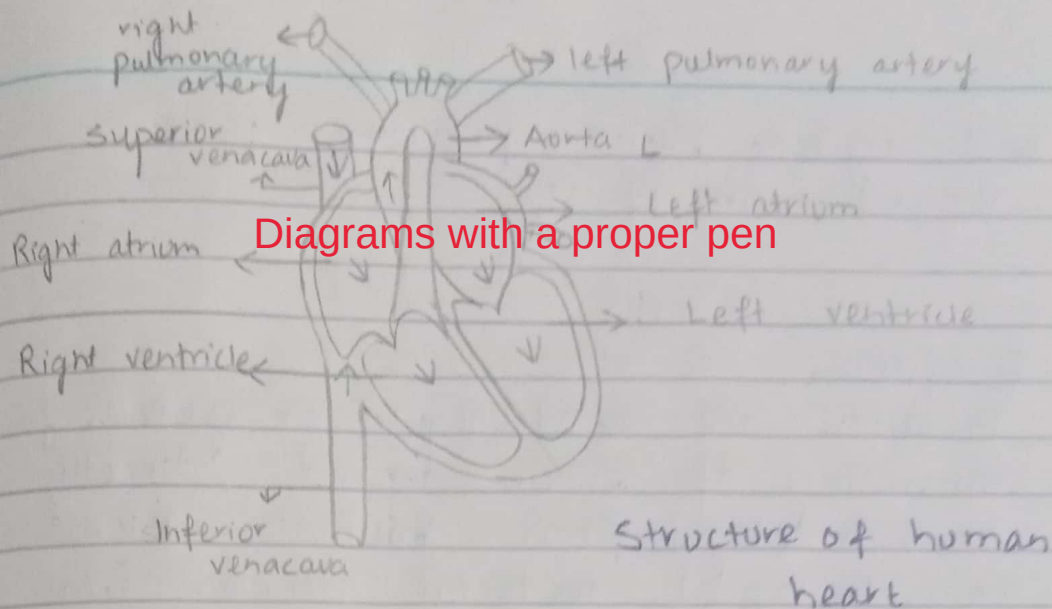
3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.

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! 🌟



Cardiac Cycle:

One complete heartbeat is called Cardiac Cycle which consists of two phases. During the first phase ventricle contract and pump blood into pulmonary arteries and aorta. To prevent the blood flow backwards into atria, atrio-ventricular valve close and create a lub sound. It is called systole. During second phase aortic & semi-lunar valves close to prevent the blood from flowing backwards into ventricles creating a dub sound. It is called diastole. One cardiac cycle completes in 0.8 seconds.

Blood Pressure: Heart regulates blood pressure by contracting and relaxing heart muscles during cardiac cycle - Standard diastolic

and systolic blood pressure is
120/80 mm of Hg.

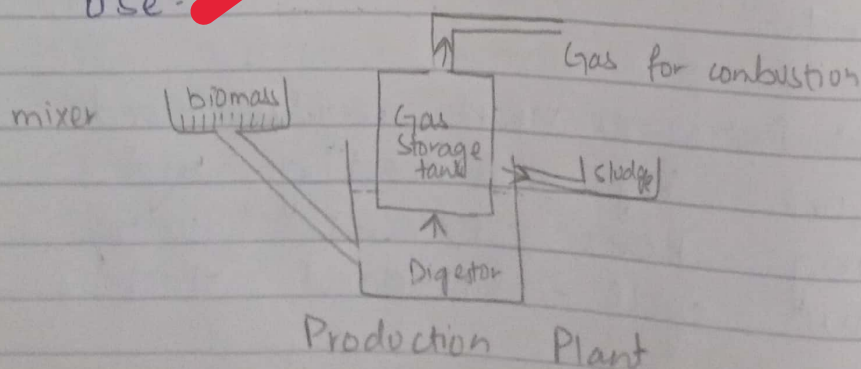
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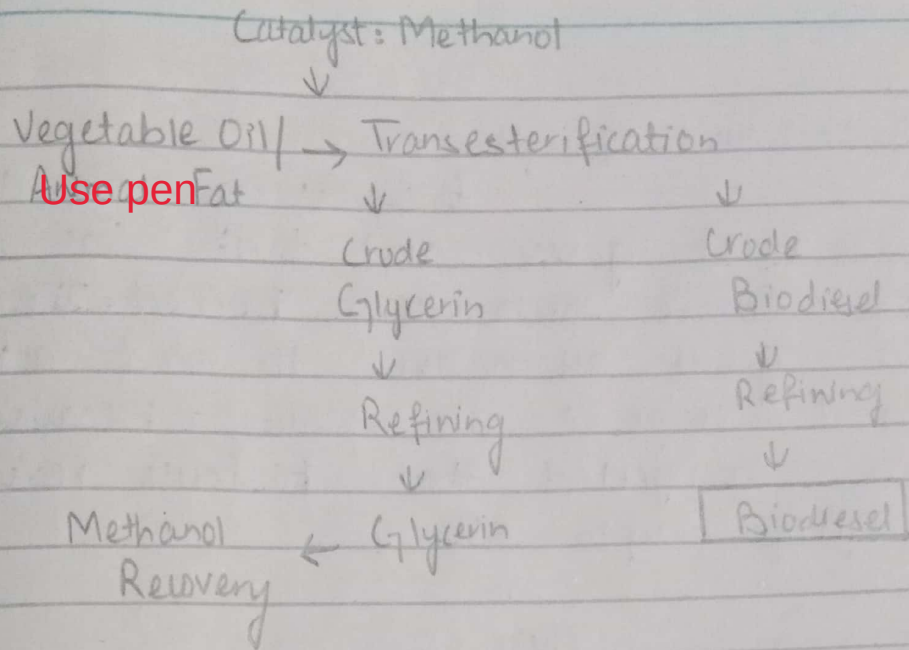
Biofuels:

Biofuels are solid, liquid or gaseous fuels consisting of, or derived directly or indirectly from biomass. Biomass is biological material derived from living or recently living organisms. Examples of biomass are fuelwood and animal dung.

Production of Biofuels:

Biogas production plant consists of a mixture, a digester and storage tank. The digester is also called a fermentation tank as it creates anaerobic conditions for the degradation of biomass. Biomass is heated and stirred for consistent discharge of gas. Gas holder is a steel container which collects the generated gas. Biomass is fed in the mixer and collected is purified for use.





Biodiesel Production

Advantages and disadvantages of Biofuels:

Biofuels are a renewable energy source which means they are sustainable and will not expire anytime soon like fossil fuels. They are cheap and economical which means that they can contribute to the economic security of country instead of being a financial burden. Moreover, biofuels have a potential of reducing our dependence of Foreign oil imports.

Biofuels also have certain disadvantages such as high consumption of water and energy for their production. They can create food shortage and moreover cause soil degradation.

Reduction of GHGs:

Biofuels generate lesser greenhouse gases and toxins as compared to fossil fuels when burned. They are a great alternative to save atmosphere and improve air quality because it is suggested that biofuels reduce GHGs upto 65%.

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On the basis of chemical composition structure of Earth can be divided into crust, mantle and core.

Crust:

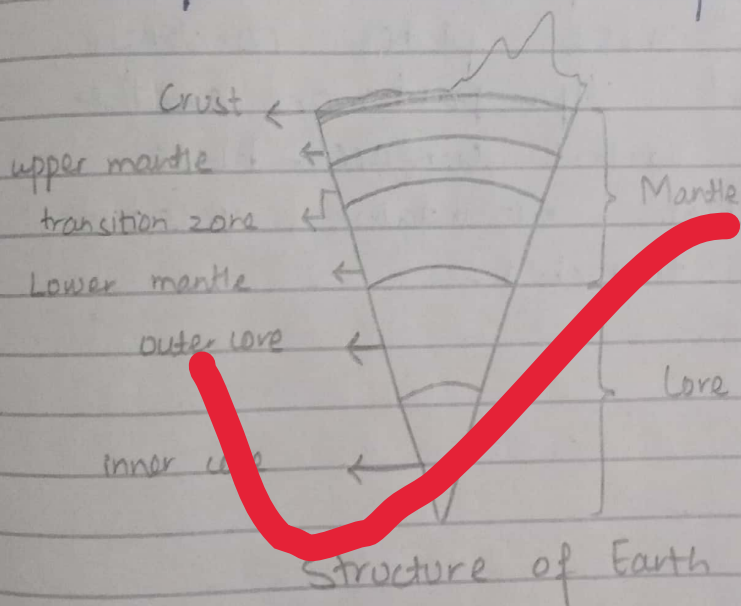
It is the outermost layer of earth composed mainly of aluminosilicates. It is around 40-70 km thick in the continents and 5-10 km thick in ocean basins. Three-quarters of earth's crust is covered with water.

Mantle:

Mantle is about 2900 km deep and is composed of iron and magnesium silicates. Upper mantle is about 400 km deep and is called asthenosphere. From 400 km to 660 km is transition zone because this part of mantle undergoes transition due to change in structure and form of atomic arrangements. Lower mantle is from

is from 670 km to 2900 km and it does not undergoes transition due to change in increase in pressure

Core: Core is divided into two layers. The outer core which is 2300 km deep is liquid due extreme temperatures and is composed of nickel iron alloy. Inner core is 1200 km thick and is entirely composed of iron. It is solid in nature due to extremely high pressure on it despite extreme temperatures.



Difference between oceanic and continental crust.

Oceanic crust is thin while continental crust is thick. Oceanic crust is located beneath deep oceans while continental crust is located beneath land.

masses and shallow seas - Oceanic crust is made out of basalt while continental crust is made out of granite. Oceanic crust is denser i.e. 3.0 gm/cc while continental crust is less dense i.e. 2.6 gm/cc

Plate tectonics:

If based on the basis of mechanical properties Earth is divided into two main layers. The top most layer is called Lithosphere which is 100 km deep. Lithosphere is broken into dozen large plates and several small ones. These plates converge, diverge and slip past one another to shape earth's surface. Plate tectonics create mountains, volcanoes and ocean trenches.

Q. No. 4

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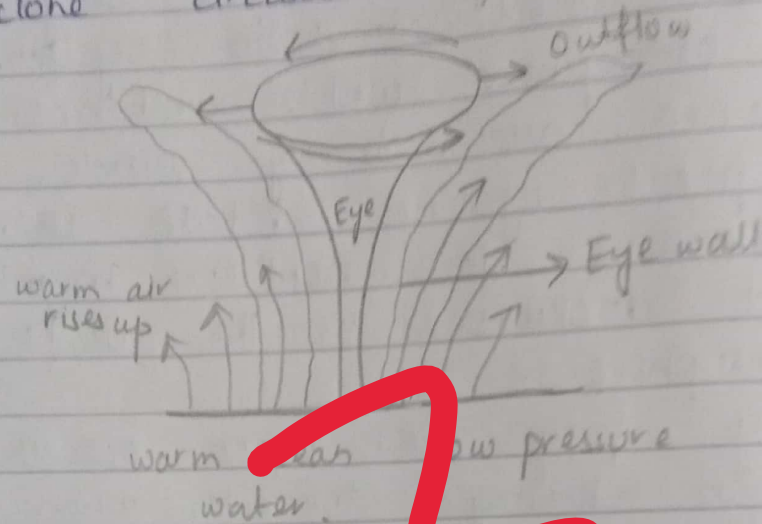
Characteristics of a tropical cyclone:

- (i) Tropical cyclones are large scale closed circulation systems in the atmosphere which combines low pressure and strong winds.
- (ii) Tropical cyclones rotate counter clockwise in northern hemisphere and clockwise in the southern hemisphere.
- (iii) They form over warm oceans and begin losing strength when they move over cool water or land.

Formation of a tropical cyclone:

Sun shines directly on Earth's tropical regions along the equator, heating this region more than temperate and polar zones. Areas of low pressure are created in tropical zone and air flows into the area of low pressure to balance it out. Cool air from the water surface rises up and condenses to form clouds. When average atmospheric pressure reaches 1013 mb, wind speed is 74 mph or faster and temperature is $\geq 26^{\circ}\text{C}$ only then cyclones are created.)

Stormy conditions and cumulonimbus clouds are formed and Earth's rotation causes the system to spin, forming a cyclone circulation.



Speed of sustained winds influence the intensity of tropical cyclones.

Impacts on coastal communities:

Cyclones travel towards coastal areas and cause grave destruction. They cause extensive damage to the property and wipe away livelihoods of coastal residents. There are often fatalities and negative socio-economic impacts afterwards.

(iii)

Vitamins:

Vitamins are organic compounds that are required by body in trace amounts to function properly.

Types:

Vitamins are divided into two classes, Fat soluble and water soluble. Fat soluble vitamins are absorbed by with food containing foods and excess of them are stored in the body - while water soluble vitamins are cannot be stored and they need to be consumed everyday to replenish body's needs. Fat soluble vitamins are A, D, E and K while water soluble vitamins are B₁, B₂, B₃, B₅, B₆, B₇, B₁₂, C and B₉.

Importance

- (i) Vitamin A is need for the maintenance of epithelial cells and they are component of light sensitive pigments in the eye. Deficiency of Vitamin A can cause night blindness.

- (ii) Vitamin C is an antioxidant and it is needed for collagen formation. It helps with skin elasticity. Deficiency of Vitamin A can cause skin diseases, dry skin, teeth and blood vessel break down.
- (iii) Vitamin B and Vitamin E are needed for hair health and growth. Their deficiencies can result in thin and weak hair.
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