

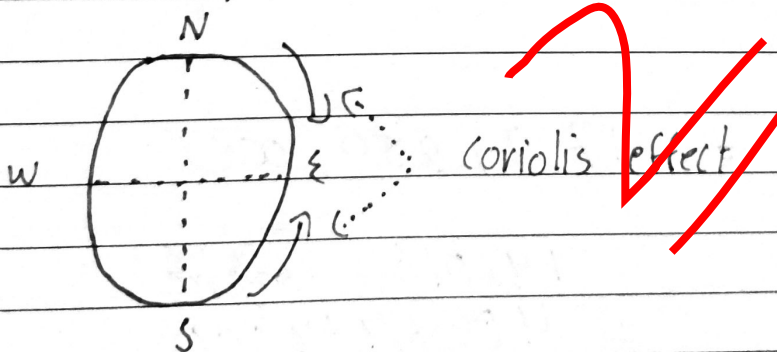
General Instructions

Date _____ 20__

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.

- Q2) a) The formation of cyclones is primarily due to pressure gradient and Coriolis effect.
3. Do not use table for comparison and contrast questions. Give small paragraphs with headings instead.
 4. Draw figures/diagram/flowchart/map in every question. The difference in air pressure between two points. It plays a vital role in the formation of cyclones. When there is a pressure gradient between two regions, the air flows from high pressure to low pressure, attempting to balance the difference. This results in warm air moving towards a low-pressure center.
 5. Start new question from fresh page
 6. Explain the steps in your mathematical calculations.
 7. Do not forget to write the unit of your answer while attempting mathematics questions.
 8. Do not use lead pencil. Only blue and black colours are allowed.

ii) Coriolis effect: is caused by the Earth's rotation. The force moves objects towards right or anti-clockwise in the northern hemisphere and towards left/clockwise in the southern hemisphere.

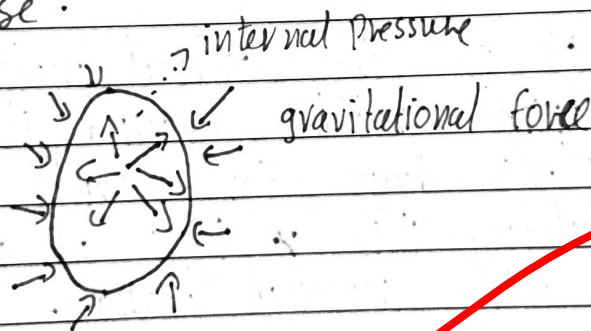


When this Coriolis effect is coupled with pressure gradient, the resulting phenomena is termed as cyclone. The strongest and most destructive winds are in the eye wall of the cyclone. This is the outer part of the cyclone that surrounds the eye.

Detail missing

b) ~~Black holes are~~ Black hole is a region in space with extreme density and a very strong gravitational pull that even the light cannot escape. Black holes are formed when ~~the~~ a star collapses under its own gravitational force. When a star loses its

When the Fusion reaction occurring in the core of the star slows down it decreases its internal pressure of the star, increasing its density. As a result - the gravitational force is able to overcome ~~forces~~ the repulsive force between the atoms in the stars core, causing it to collapse.



c) The shape of the planet Earth is like a boiled egg. It comprises of 3 parts which are

i) Crust: It is the outer most layer of Earth. This layer contains silicates and it reaches a depth of 70 km.

ii) Mantle: is the layer that lies beneath the crust. This is the largest layer of Earth and makes up of 84% of Earth's volume. This layer also contains silicates albeit at a higher pressure. It reaches till the depth of 2900 km.

iii) Core: is the inner most layer of earth and is comprised of metals (molten). It ~~starts~~ ~~begins~~ extends till the depth of 2900 Km.

The motion of earth is both rotational and revolutionary

i) Rotational: It spins around its own axis. The rotation is completed in 23 hours, 53 minutes and 4.7 seconds. The rotation causes the day and night to change.

ii) Revolution: It is the orbital motion where earth ~~spins~~ rotates around the sun. It takes 365.25 days for earth to complete one revolution. This ~~is~~ type of movement is associated with seasonal changes.

d) Ionic Bond: Type of chemical bond where an atom completely transfers an electron to another atom so both can ~~become~~ be stable.

Example: NaCl \rightarrow Table salt.
 \rightarrow An Atom must contain 8 electrons in the outer most layer (unless the outer most layer is the first layer). Na has 1 ~~at~~ electron while Cl has 7 electrons in the outer most layer. So Na transfers 1 electron to Cl, this process enables them both to reach stability.

Covalent Bond: A chemical bond formed by the mutual sharing of an electron.

Example: Water Molecule \rightarrow H_2O

The formation of water molecule comprises of 2 hydrogen atoms and one oxygen atom.

The oxygen atom needs 2 electrons to reach stability and both the hydrogen atoms require 1 each.

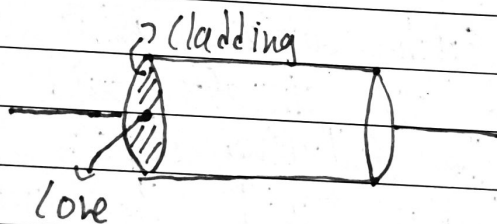
Q5) a) Remote sensing is a process of gathering information about Earth's surface using various type of sensors equipped on aircrafts and satellites. It comprises of the following steps:

- 1) Remote sensing begins with the energy source that illuminates the target area.
- 2) The Radiations emitted from the energy source interacts with the target. The light is reflected and partly absorbed by the target.
- 3) The reflected light is then intercepted by the sensors, which measure the intensity of the radiations and convert it into digital signals.
- 4) The data acquired by the sensors is then sent to stations.
- 5) The data is extracted.
- 6) The data is analysed and interpreted. The useful information derived could be applicable in various sectors.

Do not write in points form. Give small paragraphs with headings.

It can help in recognizing macro patterns. It can be used to monitor environmental resources. e.g. forest cover, glacier melting. It can be used for Disaster Management.

b) Optical Fiber is strands of glass which is used to transmit light from one point to another. It is usually used to transmit data from one part to another. It comprises of 2 parts, core and cladding. The core is the central part with high refractive index while cladding, the part surrounding core, has a low refractive index.



The optical fibre works by achieving total internal reflection of light. This usually occurs at core-cladding boundary.

c) A mobile phone is a device that can emit electromagnetic wave of highest wave length i.e. Radio waves, to receive or make calls. The cell phone comprises of two parts. In order to make calls, there are two main components, Mast and Base station. The Mast is responsible for transmitting and receiving signals, while Base stations carry out the necessary processes e.g. modulation etc.

d) Artificial Intelligence (AI) refers to imitation of human intelligence into machines that are programmed to think and act like humans. The primary characteristic of AI is to take actions based on logic, to reach a specific goal. AI models are designed to learn from their experiences; the tasks given to the machines are This means that the machine gets better at performing tasks with time, just like humans.

Q6/ a) / 4, 18, 100, 224

$$\begin{array}{r} 4 \quad 18 \quad 100 \quad 224 \\ \hline 14 \quad 82 \\ \hline 21 \quad 68 \end{array}$$

Q7 a) Father = 4 × Daughter | After 5 years
Father = 3 Daughter

After another 5 years
Father = 2 Daughter

$$F = 4D \quad \text{--- (1)}$$

$$F + 5 = 3(D + 5) \quad \text{--- (2)}$$

$$4D + 5 = 3D + 15$$

$$D = 10 \quad F = 40$$

After 5+5 years
Father = 50
Daughter = 20 **2.5 times**

b) $H^2 = b^2 + b^2$

$128 \text{ cm}^2 = 2b^2$
 $\frac{128}{2} = b^2$
 $b^2 = 64$

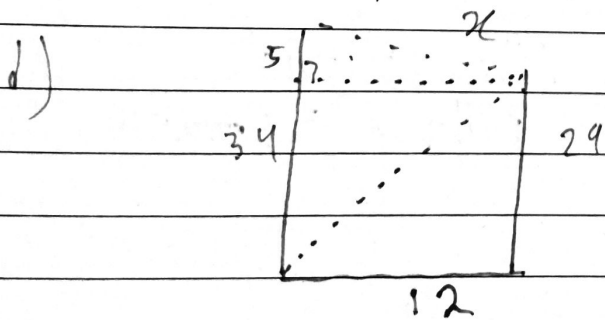
$b = 8 \text{ cm}$ = length of each side is 8 cm

Do proper working and explain the steps

c) Range: is the difference b/w highest and lowest PG number

Mode: Most repeated number

Median: Middle number of a set of values when they are set arranged in order.



$H^2 = b^2 + p^2$
 $x^2 = 5^2 + 12^2$
 $x = 13 \text{ cm}$

Details?

(Q8) a) ~~10~~

b) Mean $\Rightarrow 17 = 26 + 12 + 14 + 17 + 9 + 11 + 18 + 16 + 28, 20 + 22 + 8 + x$

Mean = 22

14