GSA- Mock

22 Sep 2023

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365

General Instructions

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings
3. Do not use table for comparison and contrast questions
4. Draw figures/diagram/flowchart where needed.
5. Start new question from fresh page.
6. Write unit of the answer in ability section.
7. Explain mathematical steps and the reasoning for better score.
8. Change colour scheme for references to give them more visibility.
9. Manage time well.
10. Wide page borders are discouraged. Should be reasonable.
11. Avoid writing wrong references.
12. Give more weightage to expressedly asked part/s of the question.

Question #3

part (a)

Cyclone

A cyclone is a system of rotating winds around a low pressure core due to pressure gradient and coriolis effect of spin motion of the Earth.

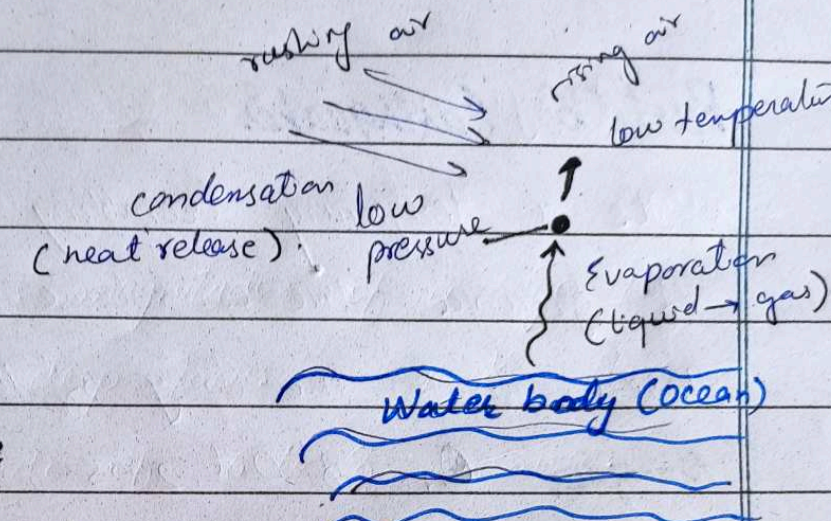
Causes of Cyclone

Cyclones are caused by a combination of several atmospheric and oceanic factors. Two important factors in the formation of cyclone are;

Pressure gradient and Coriolis effect

Pressure gradient: Pressure gradients are the areas where there are significant differences in atmospheric pressure over short distances. The creation of a low-pressure area sets up a pressure gradient. As the warm air rises from the surface of the ocean, it creates an

area of lower pressure at the surface. This rising air is the result of buoyancy - as warmer, moist air less dense than the surrounding cooler, drier air.



Coriollis effect

The earth's rotation (coriollis effect) comes into play. In the Northern hemisphere, the coriollis effect causes the air to rotate anti-clockwise around the low pressure center. In the southern-hemisphere, it causes clockwise rotation. When the coriollis effect of the spin motion of the earth is coupled with pressure gradient then the resulting phenomenon is called cyclone.

Part where cyclone winds are Strongest and destructive

The strongest and most destructive

winds in a cyclone are typically found in the **eye wall**, which is a ring of intense thunderstorms surrounding the eye of the storm.

Part (b) Earthquakes

It's a temporary trembling and shaking of ground due to release of energy stored inside the body of the Earth.

Example: On 8th Oct, 2005 Pakistan faced Earthquake. And recently Morocco faced severe destruction due to Earthquake.

Deep and Shallow focus

Deep focus earthquakes are known as intraplate earthquake, as they are triggered by collision between tectonic plates. While shallow focus earthquakes are termed as crustal earthquakes, as they exist in the earth's crustal layer. The shallow focus earthquakes occur at depths less than 70 km while that of deep focus occur at depths of 300 - 700 km. Shallow focus

Causes of Earthquake

The lithosphere is the solid crust on top of the mantle region. It is made up of giant puzzle piece called **tectonic plates** that are slowly but constantly moving. These plates sometimes get stuck due to friction and when this stress overcome the friction, energy waves are released causing shaking i.e earthquake.

Elastic Rebound theory
Volcanoes

Magnitude of Morocco Earthquake

6.8 was the recorded magnitude of Morocco earthquake

c) **Dengue fever**

It is a viral illness transmitted to humans through the bite of infected female Aedes mosquitoes.

Primary causes

Aedes mosquitoes are the primary cause of dengue fever. **Dengue virus** is the primary causative agent of dengue fever, which belongs to the Flaviviridae family.

Preventive measures

The most effective way to prevent dengue fever is to control mosquito populations and reduce the risk of mosquito bites. This can be achieved by;

Eliminating breeding sites: Empty or cover containers that collect stagnant water i.e flower pots, buckets etc to prevent mosquito breeding.

Mosquito nets: Mosquito nets should be used especially for infants and young children while sleeping.

Other preventive measures include using

insecticides, wearing protective clothing, using mosquito repellents etc

part (d) Difference between Ionic and Covalent bonds with examples.

Ionic bond

Ionic bond is a chemical bond which is formed by complete transfer of an electron from one atom to another.

Example

The bond sodium Chloride NaCl is ionic bond.

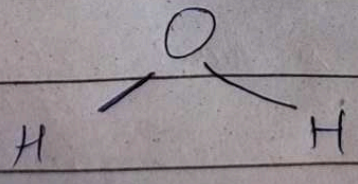
$$Na^+ + Cl^- \longrightarrow NaCl$$

Covalent bond

A bond formed by mutual sharing of electrons between the atoms.

Example

Water (H_2O) is an example of covalent bond.



Question 5

part a

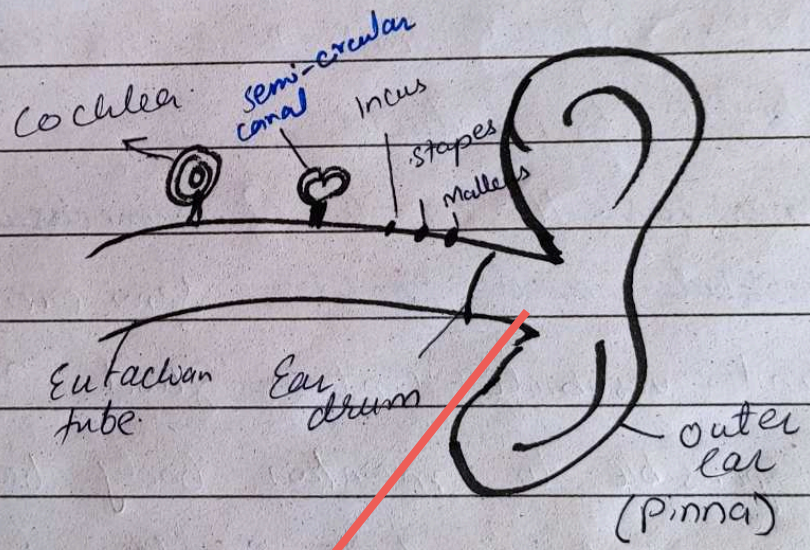
Structure and function of Human Ear

Human ear

Human ear is a sensory organ that helps us to hear the things.

Structure and Function of Human Ear

Human ear is divided into three parts namely Outer ear, middle ear and inner ear.



Outer Ear

It is the visible part of the ear. It is further divided into three parts. Pinna, which is the outermost part. It interacts with sound waves first. External auditory canal is the second part of the outer ear through which sound waves enter

into the inner ear through external auditory canal. It provides passage to sound waves. Ear drum is the third part of outer ear. Sound waves passing from the auditory canal enter and hit the ear drum and vibration is produced resultantly. These sound waves then move ahead towards middle ear.

Middle ear. It consists of ossicles namely malleus, stapes and incus. When sound waves interact with these ossicles again vibration is produced.

Inner Ear. It consists of semicircular canal, vestibule and cochlea. Semi circular canal and vestibule contain fluid. These are responsible to maintain body balance as per body positions. **Cochlea**. When sound waves move towards cochlea which is the **hearing part** of the ear. It converts the sound waves into electrical signals for impulses. Cohlea contains auditory nerves which transmit these electrical signals towards brain which then translates and perceives the signals.

Part b Digestive system and role of small intestine in digestion.

Digestive System: Digestive system is all about digestion / break down of food into the simpler particles. The system which is responsible for the breakdown of larger food particles into simpler and absorbable food particles is termed as digestive system.

Role of Small Intestine in digestion.

Small intestine plays a fundamental role in the process of digestion. About 90% of the digestion takes place in small intestine. Here digestion completes and absorption takes place. It is further divided into three components.

i) Doudenum ii) Jejunum iii) Ileum.

Doudenum: It is the smallest part having length 20-25 cm. It releases enzyme called enteriokinase. Pancreas release pancreatic juice via pancreatic duct towards the doudenum. In pancreatic juice there exist amylase which converts starch into maltose, Sodium bi

carbonate which neutralizes the acidic nature of chyme; Lipase that converts lipids/fats into fatty acids and Trypsinogen is converted into trypsin. Enteriokinase converts trypsinogen into trypsin which further converts protens into polypeptides.
Liver releases bile that converts fat into fatty acids. Thus, digestion in duodenum is facilitated by pancreas and liver.
Pancreas release pancreatic juice that contain multiple chemicals responsible for the digestion of food and bile from liver converts fat into fatty acids.

Diagram?

Jejunum

It is the largest part of small intestine. It releases intestinal juice which comprises of amino peptidase for converting polypeptide into di-peptide, erypsin for converting di-peptide into amino acids, lipase that is used to convert remaining fat into fatty acid and Lactose and Maltose convert lactose and maltose into glucose.

3. **Ileum**: Then the food passes from ileum and is interacted with by villi and absorption of food takes place with the help of villi in ileum. Digested food is absorbed into capillaves and through them blood aborbs nutrients.

Part C Short note on Vitamins

Vitamins

Vitamins are the organic compounds essential for body working. They are vital for proper functioning of the human body. While the body requires vitamins in relatively small quantities as compared to macronutrients like carbohydrates, protens, and fats, their absence or deficeney can leed to a wide range of health problems.

Types. There are two main types of vitamins.

(i) Water Soluble (ii) Fat-Soluble

Water Soluble Vitamins. These vitamins are

soluble in water and include vitamin C and the B-complex vitamins (B1, B2, B3, B5, B6, B7, B9 and B12).

Fat Soluble vitamins - These vitamins are fat soluble as they can be stored in the body's fat tissues and liver. These vitamins include A, D, E and K.

Functions of vitamins

There are various functions of vitamins like they act as antitoxidants, play role in converting food into energy and maintain a healthy metabolism. Moreover, they are essential for bone health, blood clotting, vision and immunity.

Sources : vitamins are found in a variety of foods, and a balanced diet should provide an adequate intake of these vitamins. Some of the sources include ; fruits, vegetables, nuts, grains, meat, dairy products, sunlight etc.

Deficency and Excess

Their deficency can lead to a range of health issues like fatigue, weak immunity, skin problems etc. Excess intake

can lead to toxicity symptoms.

part d

Functions of pituitary glands

Pituitary gland

The pituitary gland is referred to as the master gland of the endocrine system. It plays a central role in regulating various physiological process in the body by releasing hormones.

Functions

It consists of three lobes namely anterior lobe, median lobe and posterior lobe. Anterior lobe consists of STH, TSH, ACTH, ~~Gondal~~ Gonado tropic ~~hormone~~, ~~follicle~~ follicle-stimulating hormone (FSH), LH and prolactin. These are fundamental in the growth of the body parts, activation of myroid gland, adrenal glands. They play a crucial role in the reproductive system. Median lobe releases melano-phore stimulating harmone (MSH) which stimulates melanocytes. It play role in the skin colour. Posterior lobe contains oxytocin and ADH which

are involved in various reproductive and social behaviours and also regulate the balance of the body.

Thus, pituitary gland plays a vital role in regulating numerous physiological process including growth, metabolism, reproduction, stress response, and water balance

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Section - II

Q#6

Identifying the Series

(a) i) 10, 100, 200, 310, 430.

Sol

$100 - 10 = 90$

$200 - 100 = 100$

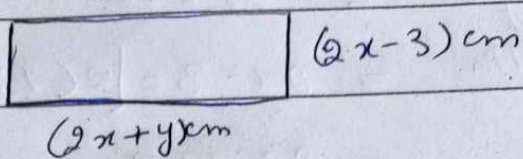
$310 - 200 = 110$

The differences between the consecutive terms are increasing by 10 each time. So, it 10 should be added to the difference between the consecutive terms for each term.

So, $310 + 110 + 10 = 430$.

ii) 3, 7, 23, 91, 383

(b) Area of rectangle.



Sol. Perimeter = Sum of all sides = 114 cm

In a rectangle parallel sides are equal,

So, $3x - y = 2x + y$

$\Rightarrow x = 2y \longrightarrow (1)$

Now perimeter

$114 = (2x-3) + (3x-y) + (2x+y) + (2x-3)$

$114 = 9x - 6$

From (1)

$114 = 9(2y) - 6 \Rightarrow 114 = 18y - 6$

$y = \frac{120}{18} = 6.667$ cm

Now substituting back the value of y in (1)

$x = 2(6.667\text{ cm})$

$x = 13.334$ cm

Now putting the values of x and y in

$3x - y = 3(13.334) - 6.667$

$= 33.335$

and

$2x + y = 2(13.334) + 6.667$

$= 33.335$

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Thus, length of the rectangle = 33.335 Cm

Now width = $2x - 3 = [2(13.334) - 3]$

= 23.668 Cm

As we know area of rectangle

= $l \times w$

= 33.335×23.668

= $788.97\ cm^2$.

c) Let x and y be the ages of Nisha and Roni respectively.

Acc to the information,

Five years ago, their ages were

$$x-5 = 3(y-5)$$

$$x-5 = 3y-15$$

$$x-3y = -10 \longrightarrow (1)$$

Present ages

$$x = y+15 \longrightarrow (2)$$

Put the value of x in (1)

$$x-3y = -10$$

$$(y+15)-3y = -10$$

$$y+15-3y = -10$$

$$-2y = -25$$

$$y = 12.5$$

Now, put the value of y in (2)

$$x = 12.5+15$$

$$x = 27.5$$

Thus, Nisha's age is 27.5 years at present

d) To find the largest possible number of cartoons needed, greatest common divisor (GCD) is required to determine 210, 252, 294.

2	210, 252, 294
2	105, 126, 147
3	105, 63, 147
7	35, 21, 49
5	5, 3, 7
3	1 - 3 - 7
7	1 - 1 - 7
	1 - 1 - 1

GCD = $2 \times 3 \times 7 = 42$

So, the largest possible number of cartoon needed is 42 cartoons. Each cartoon will contain the same no. of oranges, apples, and pears.

Q8//

c)

Men	Distance (km)	Days
50	20	40
70	20	x

$$\frac{x}{40} = \frac{50}{70}$$

Explain in words as well

$$x = \frac{50}{70} \times 40 = \frac{200}{7}$$

$$x = 28.57 \text{ days}$$

28.5
7)200.0
14
60
56
40
35
5