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Exam: General Science & Ability

Part - II  
Section - 1

Question - 04

(a)

How earthquakes are generated?

Distinguish with Tsunami.

Answer:-

What is an earthquake:-

Earthquakes are basically tremors or shocks produced in the earth's crust.

Factors related to earthquakes:-

A number of factors can be attributed as the reasons of earthquakes like:-

(i) Movement of plate tectonics

(ii) Bursting of volcanoes

(iii) Human activities like experiment of bombs or underground drilling.

However, earthquakes as natural phenomenon occur due to movement of tectonic plates.

### Generation of Earthquakes:-

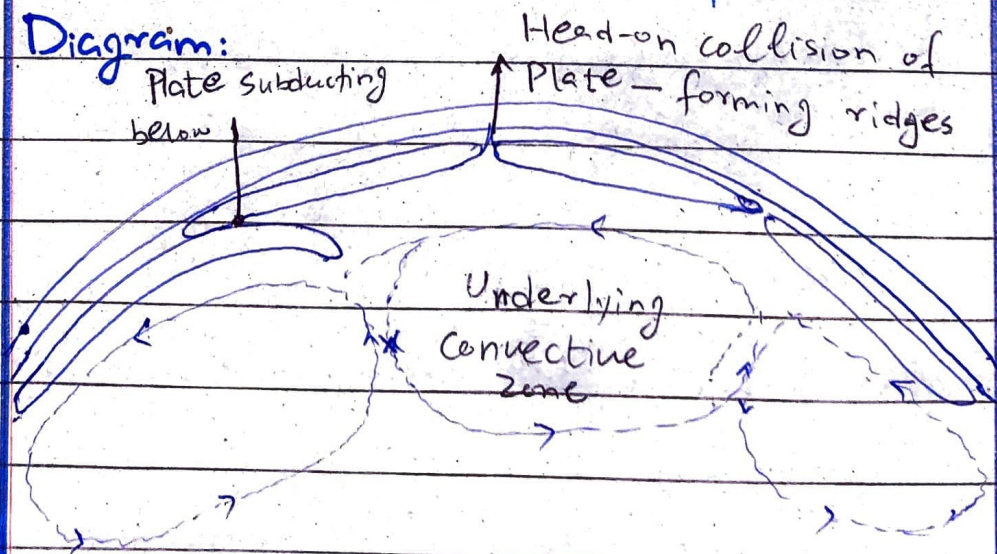
The earth crust consists of plates. These plates when move cause tremors in the earth surface.

These plates may :-

(i) Slide past one another

(ii) Slide below another plate

### Diagram:



## Focus and Epicentre:-

The point below the earth where the earthquake originates is called focus of earthquake and,

The point exactly above on the earth's surface is called epicentre.

## Distinguish with Tsunami:-

Tsunami is fast and uncontrolled movement of sea waves.

During Tsunami, the height of sea waves can range from 5 meters to 30 meters.

## Cause of Tsunami:

Tsunamis are high intensity sea waves which can only be made <sup>by</sup> powerful phenomena like-

(i) Earthquake below sea

(ii) Bursting of volcanoes under the sea

Hence, earthquake could be a cause

of Tsunami.

### Question - 04 (b)

What is Coriolis Force? How hurricanes are generated?

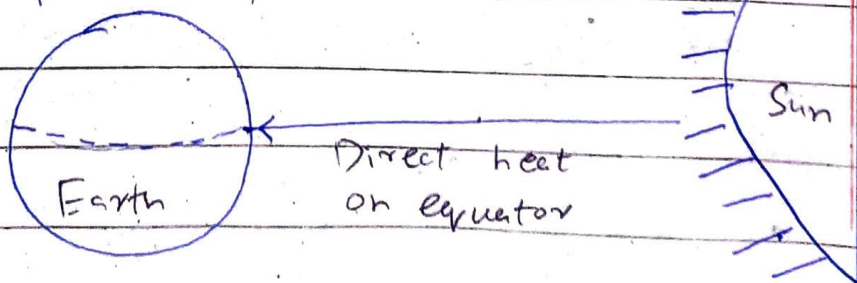
Answer:

Coriolis Force:-

Our sun does not heat the earth equally, and the movement of earth coupled with sun's unequal heating creates a weather phenomenon called Coriolis effect.

How Coriolis Effect is generated:-

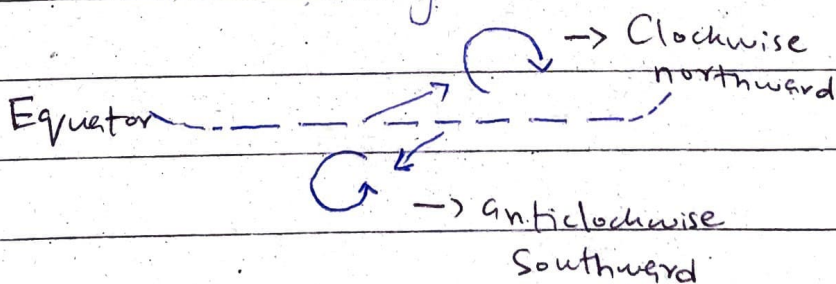
Sun is shining over the equator more brightly than the other parts of the earth.



Air from the equator rises when it gets hot. After rising when it moves towards North or South, it changes its direction due to the movement of the earth.

### Change of Direction

When the rising hot air moves towards North it starts rotating clockwise, and if it is pushed towards South of the equator, it starts rotating anti-clockwise.



### Understanding with the example of a Spinning wheel:-

Imagine a spinning wheel ride, if a ball is thrown out of it when it is rotating, it will change its direction and will not follow the

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previous direction it was thrown.

## Generation of Hurricanes:-

Hurricanes are created due to imbalance of heating and air pressure. When the sun heats the earth, hot air rises. When it keeps rising, it is surrounded by cool air from the neighbouring regions. This imbalance of hot air rising inside and cool air around causes the phenomenon of hurricanes or typhoons when they travel towards neighbouring regions.

### Question - 04 (C)

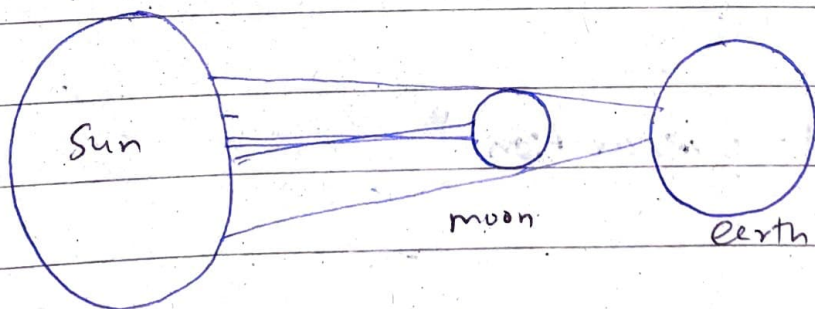
Distinguish Solar and Lunar Eclipse.

Answer:

Solar Eclipse:-

Solar eclipse is the phenomenon when the sun is eclipsed behind the moon, i.e., the moon comes in the centre of earth and the sun.

• Diagram:-



• Period

Solar eclipse can be seen every 18 months

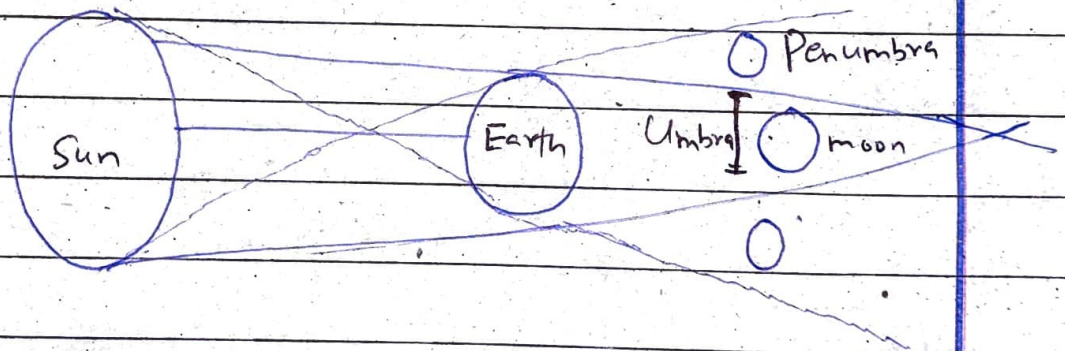
• Precaution

It is dangerous to look at solar eclipse.

## Lunar Eclipse

The phenomenon when the moon (scientific name: Luna) is eclipsed, i.e., the earth comes between the sun and the moon.

### Diagram



### Period

Lunar eclipse can be seen twice every year.

### No precaution

It is safe to look at lunar eclipse.



## Question-04 (d)

What is doping in semi-conductors?  
Discuss different types of ceramics.

Answer:-

Doping in Semi-conductors:-

Doping is the process of attaching elements to make P-type or N-type semi-conductors. And, the element being doped is called dopant.

P-type or N-type Doping:-

Doping can be either p-type or n-type. In the former, the coming element has an electron deficit which creates a hole in the matrix, while in n-type there is an extra electron which cannot be combined with other electron so this electron keeps moving in the matrix.

## Different Types of Ceramics:-

Ceramics are basically inorganic non-metal clay hardened by heating to perform specific functions.

### • Types of ceramics

- (i) Simple ceramics
- (ii) Nano-ceramics

### • Simple ceramics

These are generally used ceramics being used in daily lives. They are hard, coarse, and refractory substances used in manufacturing of surgical instruments, industrial equipments and houseware.

### • Nano-ceramics

Nano-ceramics are made of nano particles <sup>and</sup> have more efficient in nature. They have larger surface area and greater resistance to heat.

## Question - 05

(a)

Distinguish b/w RAM and ROM.  
Also define Mibble and USB.

Answer:-

RAM and ROM:-

• RAM:-

RAM is basically 'random access memory.' It is needed by the computer to run and perform functions.

• Functions of RAM:-

(i) Perform the functions

(ii) Perform and store data

temporarily

(iii) Used by all software to run

• ROM:-

ROM is basically 'read only memory.' As the name implies, it is used as a permanent storage by the system.

## Functions of ROM:-

- (i) Used as a permanent storage
- (ii) Not accessed by softwares all the time.
- (iii) Referred by system ever time it needs data.

## USB and Mibble:-

### USB:-

An updated form of flash-stick to be used as a permanent storage device.

## Question-05 (b)

How AI has revolutionised the world?

Answer:-

Artificial intelligence (AI) has brought advancements in every aspect of life. Some notable examples are as follows:-

### (i) Reforming the Education

AI is rapidly advancing the education systems. The introduction of AI-powered systems like ChatGPT calls for a new type of education system away from plagiarism. All the knowledge is only a click away and at human's command.

### (ii) Reforming the business

AI-powered chatbots are managing business websites more effectively than their human

counterparts.

### (iii) AI-powered Cleaning System

AI-powered cleaning systems in homes are lowering man-force reliance. AI-powered robots are also being used for the cleaning of solar panels and hard-to-access places.

### (iv) Powerful Marketing Tool

AI algorithms are powerful in social media marketing. They show interest-oriented content and ads which have completely reformed the marketing.

### Question 05 (c)

How does optical fiber work?  
Write some of its advantages.

Answer:-

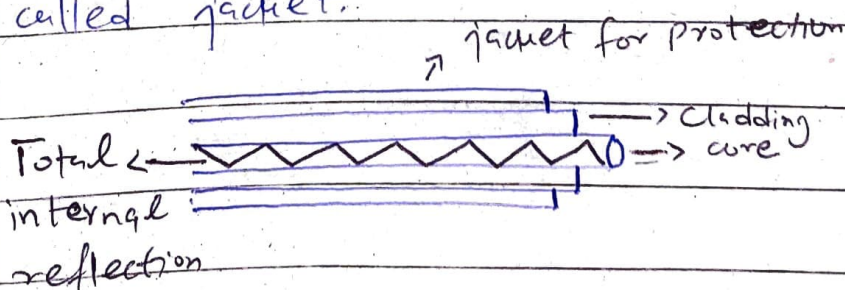
Optical fibres are the latest technology of signal transmission.

### Working of Optical Fibre:-

Optical fibre works on the phenomenon of total internal reflection.

### Design of Optical Fibre:

An optical fibre consists of a core, a cladding and upper covering called jacket.



The phenomenon of total internal reflection is useful because no signal is lost in this way.

## Advantages of Optical Fibre:-

Some advantages of optical fibre are given below:-

1. No loss of signal because of total internal reflection
2. Fast signal travel
3. Light, easy to carry cables
4. Good protection by a secure jacket.
5. Not expensive.



### Question 05 (d)

What is critical speed of a satellite? Differentiate Geo-stationary and Polar Satellites.

Answer:-

**Critical speed of a satellite:-**

Critical speed of a satellite is defined as the minimum speed required by a satellite to move out of earth's atmosphere and start orbiting in its orbit.

**Geo-stationary Satellite:-**

- Geo-stationary satellites are those which have orbits and rotation congruous to that of earth's orbit and rotation speed.
- They revolve at specific points with respect to the rotation speed.

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## Polar Satellites:-

- Polar satellites are those which have fixed position at the poles of the earth.

- They are at North and South Poles of the earth, and revolve accordingly.

## Section - II

## Question-06 (a)

Five years ago ---- current age of father?

Consider,

Age of father =  $y$

Age of son =  $x$

Five years ago :-

$$\Rightarrow y = 3x$$

Now :-

$$\Rightarrow x = 30 \text{ years}$$

but, 5 years ago :-

$$\Rightarrow x = 30 - 5 = 25 \text{ years}$$

$\Rightarrow$  So, 5 years ago :-

$$\Rightarrow y = 3(25) = 75$$

Hence, age of father now :-

$$\Rightarrow y = 75 + 5 = 80 \text{ years.}$$

$\Rightarrow$  Age of son now = 30 years

$\Rightarrow$  Age of father now = 80 years

(b)

Find value of  $y$ .

Given:-

Mean of 10, 30,  $y$ , and 50 = 50

Solution:-

$$\Rightarrow M = \frac{10 + 30 + y + 50}{4} = 50$$

$$\Rightarrow 10 + 30 + y + 50 = 200$$

$$\Rightarrow y + 90 = 200$$

$$\Rightarrow y = 200 - 90$$

$$\Rightarrow \boxed{y = 110} \text{ Ans.}$$

(c)

(i) 2, 6, 18, 54, —

Solution:-Each number being multiplied  
by 3.

$$\text{So, } 2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

So, the series  $\rightarrow 2, 6, 18, 54, 162$

(ii) 3125, 256, — 4, 1

(d)

Consider two numbers  $\rightarrow x$  and  $y$ 

$$\Rightarrow xy = 320 \text{ and } \frac{x}{y} = \frac{1}{5} \Rightarrow x = \frac{y}{5}$$

$$\text{So, } \frac{y}{5} \times y = 320 = y^2 = 1600 \quad (y = 40) \text{ and}$$

$$\text{So, Diff. of squares} = 1600 - 24 \quad (x = 8)$$

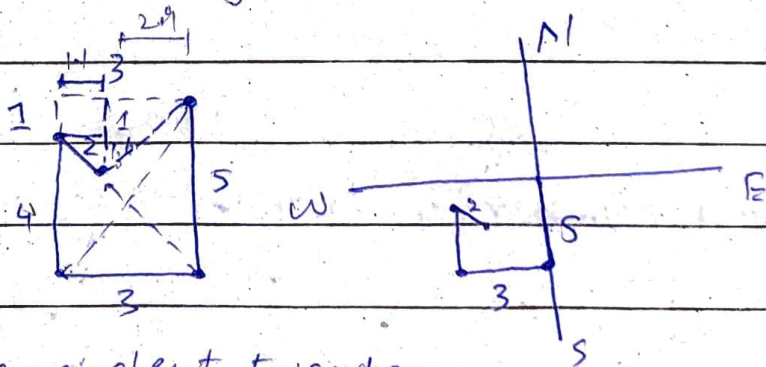
Question - 08

(a)

A crow travels south Sum, —  
from initial point.

Solution:-

Determining by the plane:-



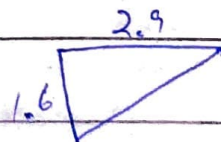
By equivalent triangles:-

$$\Rightarrow \frac{5}{3} = \frac{2}{x} \quad ; \quad x = \frac{6}{5} = 1.2$$

$$\text{and, } \frac{5}{4} = \frac{2}{y} = \frac{8}{5} = 1.6$$

$$\Rightarrow (H)^2 = (BF)^2 + (P)^2$$

$$\Rightarrow (1.2)^2 = (1.6)^2 + (2.9)^2$$



(b)

Given:-

Total slices = 8

Slices with raisin = 3

Solution:-

Using formula:-

$$\Rightarrow \frac{\text{Occurrence of the event}}{\text{Total no. of event}}$$

$$\Rightarrow \frac{3}{8}$$

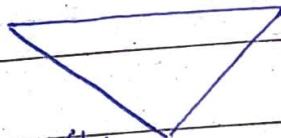
So, there is  $\frac{3}{8}$  probability that she will pick a slice with raisin.

(c)

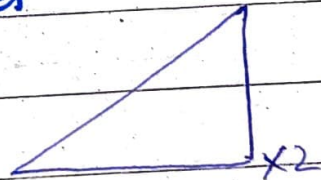
Find number of triangles



x8



x4



x2

There are total 74 triangles in the given figure.

(d)

Factors which can affect the IQ.

Answer:-

Following are the factors which can affect IQ:-

(i) Genes

Genes are a major cause of determining the IQ.

(ii) Development of early childhood

Mental attention in early childhood also determine the IQ.

(iii) Mental Activity

Consistently making use of the brain and the mental capacity also determine the IQ.

(iv) Nourishment in childhood.

Nourishment especially in early childhood determine the IQ.