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IB-066

Roll # 34644

Mok Exam-6

GENERAL SCIENCE AND ABILITY

Question # 3

* Part a. Explain and draw the structure of Sun.

Core

Radioactive zone

Corona

Convection zone
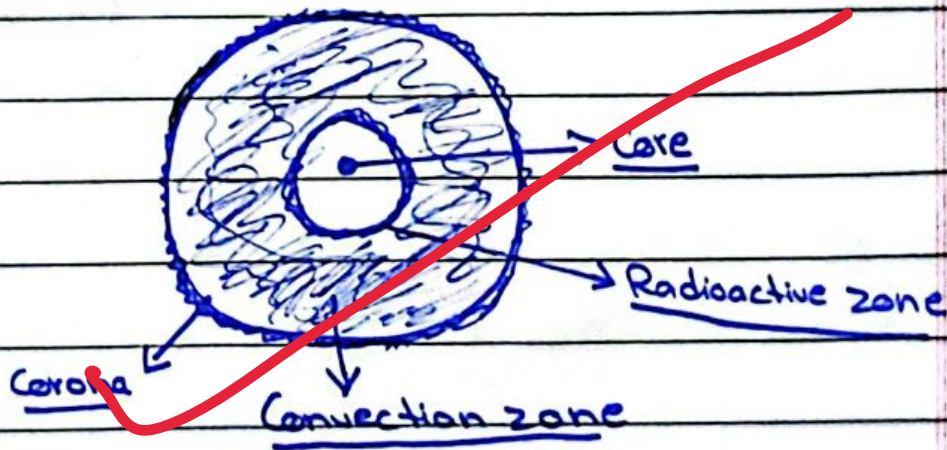
2⟶ Explanation:

The Sun is the largest body in our solar system. It is a burning star of gases

and it is the main supplier of energy to the planets. It holds 99.8% of the whole mass of our solar system.

Different parts of sun's structure are as following:

1) **Core**: It is central part of sun where fusion takes place and generates energy.

2) **Radiative zone**: In this area, energy moves outward from core in the form of electromagnetic radiation.

3) **Convection zone**: In this part, hot plasma rises and the cold plasma sinks, creating a convection current.

4) **Corona**: It is the outermost layer of sun, extending into space and easily visible during eclipses.

* Part b: What is tsunami? How it is generated? Give examples of a few recent tsunamis.

The word Tsunami is taken from two japanese words;

"Tsu" which means 'harbor' and 'name' which means 'wave'. So literally it means 'Harbor Wave'. A tsunami is a large, powerful ocean wave caused by the displacement of huge of water, causing destruction.

2→ How it is generated:

Tsunami is generated when a large amount of water is displaced from its position usually because of underwater earthquake, volcanic eruption or due to any landslide. This disrupted cause the water water to displace and when these waves hit the costal belt, they took height and became a reason for the destruction.

2→ Recent tsunamis

- Tohoku Tsunami, Japan, 2011
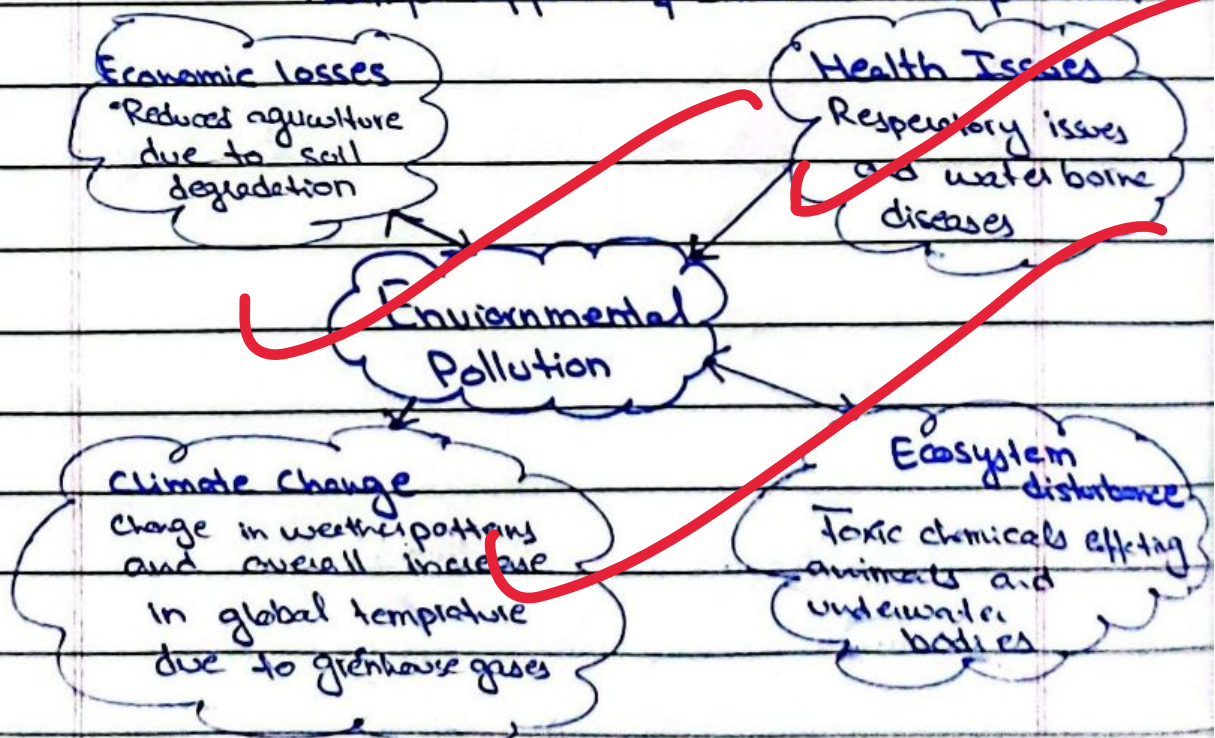- Sulawesi Tsunami, Indonesia, 2018
- Indian Ocean Tsunami, 2004

* Part c. Discuss enviornmental pollution.
What could be its harmful effects?
Give a few measures to curb it.

Enviornmental pollution

Anything hazardous present in the atmosphere which causes adverse effects on ecosystem, human health and an overall quality of life is termed as enviornmental pollution. It occurs in various forms, suchas air pollution, noise pollution, land pollution and water pollution.

→ Harmful effects of Enviornmental pollution

Economic losses
•Reduced aquiulture due to soil degradation

Health Issues
Respertory issues and waterborne diseases

Enviornmental Pollution

Climate Change
Change in weather pattern and overall increase in global temprature due to greenhouse gases

Ecosystem disturbance
Toxic chemicals effecting animals and underwater bodies

2→ Measures to Curb
Envioronmental Polution

1) Implementing strict policies to reduce the use of fossil fuel.

2) By adopting affective waste management system.

3) Afforestion, to absorb the excess amount of CO_2 in the air

4) Through public awareness and compaigns.

★ Part d: What is wireless communication? Briefly explain the working of a satellite.
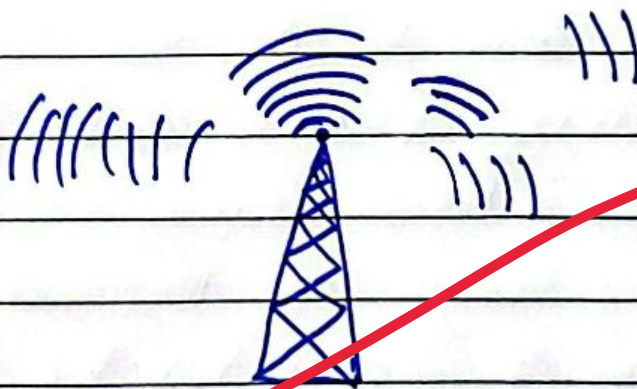
2→ Wireless Information/Communication

Wireless communication refers to the sharing of information, data and instruction without

any physical medium (such as wire). It relies on electromagnetic waves, radio waves, microwaves and infrared waves to transmit data over larger distance.

2→ Examples:- mobile phones, Wifi, Bluetooth, and Satellite Systems.

2→ How a Satellite Works
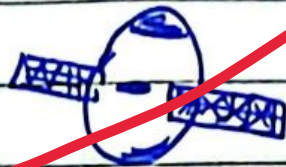
A Satellite is a made made object which orbits around the earth to send data to its receivers. In the working of satellites, following steps are includes:

1) Uplink: Also known as transmission from earth. It means that the input or commands are send to the satellite to provide information accordingly.

2) Onboard processing: In this step, Satellite receives the signal through

its antinas, process it and converts
the signal as needed.

3) Downlink: This refers to the
transmission to earth. In this step,
satellite provides all the necessary
details to the specific receiving
station on earth.

Question # 5

* Part a: Differenciate between a
eukaryotic and a prokaryotic cell.

Eukaryotic	Prokaryotic
Size	
• It is larger in size (10-100 μm)	It is smaller in size (1-5 μm)
Nucleus	
• It has a nucleus	• It do not posses nucleus.
DNA	
• It has linear DNA organized into Chromosomes.	• Circular DNA without histones.

Ribosomes

•large ribosomes	•Small ribosomes

Cell Division

•Mitosis or meiosis	•Binary fission

Cell Wall

•Present only in plant cells.	•Present in most Prokaryotics.

Reproduction

•Both Sexual and asexual reproduction	•Only asexual reproduction

Examples

•Plants, Animals, fungi and protists.	•Bacteria and archaea.

★ Part b: What is global warming? What is Kyoto protocol?

2→Global Warming

Global warming refers to the average increase in the

temprature of the earth due the accumulation of greenhouse gases, such as Carbon dioxide (CO_2), Methane (CH_4) and Nitrogen oxide (N_2O) in the atmosphere.

→ Effects of global warming:

- Increasing average temprature of the earth.
- Frequent change in weather patterns
- Ecosystem disruptions and loss of biodiversity.
- Severe threats to food security and human health.

2 → Kyoto Protocal

Kyoto Protocal is an international treaty adopted in 1997 under the United Nations Framework Convention on Climate Change (UNFCCC), to combat global warming by reducing greenhouse gas emissions.

Key features of Kytoprotocol:
1) Developed countries committed to

reduce carbon emission.

2) Tools like carbon trading and clean developement mechanism (CDM) come into being.

*   Part c: Write a detailed note on GIS.

GIS stands for Geographic Information System and sometimes also called Geographic Information Science. It is a framework that combines the hardware, software and data to get useful geographic information. It is widely used by enviornmentalists. However, it applications also includes the users to get visuals in the form of maps, reports, charts and patterns.

→ Functions of GIS:
1) Data Collection: It collects data from the satellites.
2) Data Storage: It stores data in

its database for efficient retrieval.

3) Data Analysis: Performs spatial analysis to identify patterns, relationships and trends.

4) Visualization Creates maps, 3D models and reports to present the analyzed data to the user.

5) Dicision Support: Assists in making decisions according to the current situation. It helps in urban plannings, disaster management and natural resource management.

Part d: Briefly describe antioxidants.

2→Antioxidants

Antioxidants are the substances which slow down or prevent the damage to cells caused by free radicals. By neutralizing free radicals, it helps in the protection from the oxidative stress, which is

linked to aging and various chronic diseases.

→ Sources of Antioxidants

Antioxidants are produced by the body naturally such as glutathione, and can even obtained from external resources such as vitamins, minerals and other neutrients.

→ Roles of antioxidants in human body/Health

Antioxidants reduces the oxidative damage to LDL cholesterol. It also protects the cells from DNA mutations, which causes cancer and it protects against age-related macular degeneration and cataracts.

Section II

Question # 7:

(a)

1) I.Q

I.Q Stands for Intelligence Quotient. It refers to measures to cognitive abilities of any person, like logical reasoning, problem solving and intellectual potential. It also focuses on mental capacities such as analytical skills and mathematical abilities.

2) E.Q

E.Q stands for emotional qotient. It measure the emotional intelligence, including the ability to recognize, understand, manage and to solve the real time problem. It is important for interpersonal relationships, leaderships and dealing with stress.

(Part b)

Solution:

Let the age of Aman = x

After 20 years $= x + 20$

10 years ago $= x - 10$

According to the statement:

$$x + 20 = 10 \times (x - 10)$$
$$x + 20 = 10x - 100$$
$$20 + 100 = 10x - x$$
$$120 = 9x$$
$$x = \frac{120}{9}^{13.}$$

$$\boxed{x = 13.3} \quad \text{Ans.}$$

(Part c)

Solution:

Peter = 40 minutes

John = 60 minutes

Together = x

To find x, we have to find their avg rate.

Peter's rate = $\frac{1}{40}$

John's rate = $\frac{1}{60}$

$\rightarrow$ Combine rate $= \dfrac{1}{40} + \dfrac{1}{60}$

$$= \dfrac{3+2}{120}$$

$$= \dfrac{5}{120}_{24}$$

$$= \dfrac{1}{24}$$

$\rightarrow$ Time is the reciprocal of their combined rate. So

$$= \dfrac{1}{1/24} = 24$$

· Hence, both will take $\underline{24}$ minutes to mow the lawn together.

(Part d)

Solution:

let the original no. be N

Correct result $= N \times \dfrac{5}{3}$

Incorrect result $= N \times \dfrac{3}{5}$

To calculate error,

$$\text{Error} = \left(N \times \dfrac{5}{3} \right) - \left(N \times \dfrac{3}{5} \right)$$

$$= N\left(\frac{5}{3} - \frac{3}{5}\right)$$

$$= N\left(\frac{25 - 9}{15}\right) \qquad = N\left(\frac{16}{15}\right)$$

→ To calculate percentage error

$$= \frac{Error}{Correct\ result} \times 100$$

$$= \frac{N \times \frac{16}{15}}{N \times \frac{5}{3}} \times 100$$

$$= \frac{16}{15} \times \frac{3}{5} \times 100$$

$$= \boxed{64\%} \qquad Ans.$$

Question # 8

(Part a)

Solution:

length of classroom = 15 ft

width = 60% of 15 ft

dimension = ?

As we know that,
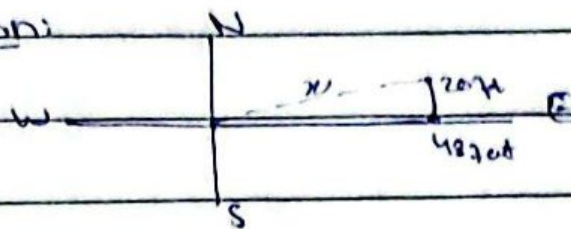
$$width = \frac{60 \times 15}{100} = 9$$

width = 9 feet

Hence, length = 15 ft and width = 9 feet Ans.

(Part b)

Solution:

N
W ————————— E
x)] 20ft
48ft
S

veena ran to east = B = 48 ft

then veena ran to north = P = 20 ft

Straight distance = H = ?

According to Pythagorean Theorm

$$H^2 = B^2 + P^2$$

$$H^2 = (48^2) + (20)^2$$

$$H^2 = 2304 + 400$$

$$H^2 = 2704$$

$$\sqrt{H^2} = \sqrt{2704}$$

$$H = 52 \quad \text{Ans}$$

Hence, veena would run $\underline{52}$ feet.

(Part C)

Solution

Total Students = 40

Average marks = 52.14

Total marks = 40 × 52.14

= 2086

• Correction in number of a student.

-85 - 49 , = 36

New Total marks = 2086 + 36

$$= 2122$$

Average $= \dfrac{2122}{40}$

$= 53.05$ Ans.

(Part d)

Solution:

people who like veg. pizza = 37

people who like chick pizza = 25

people who like neither = 3

→ Total no. of people who like pizza

$= 25 + 37 - 3$

$= 59$

→ To calculate probability

people who like chicken = 25

Total no. of people = 59

So, $\dfrac{25}{59}$ is the probability.