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Creat headings in the content.
Follow step by step math solutions
Good attempt

Section-I:

Q3:

(a)

The sun is a massive ball of hot plasma and is structured into several layers each playing a crucial role in energy production and emission. Below is an explonation of its structure, layer by layer, followed by a simplified diagram.

Structure of the sun:

1. **Core**: The core is the central region of the sun. It is where nuclear fusion occurs, converting hydrogen into helium and releasing massive amounts of energy. It is extremely dense and its temperature could reach 15 million° centigrade.

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2. **Radiative Zone**: The radiative zone surrounds the core upto 70% of the sun. This zone facilitates the transfer of radiation to outer layers of the sun.

3. **Convective Zone**: The convective zone extends outwards to the surface of the sun. Heat is transferred outward via convection. In this layer, hot plasma rises, cools near the surface, and sinks back.

4. **Photosphere**: The visible layer of the sun is called photosphere. It emits most of the light that we see but itself is a formation of plasma. Temperatures in this area can reach upto 5500°C.

5. **Chromosphere**: This region exists just above the photosphere and emits ultraviolet radiation. It is visible as a reddish glow during a solar eclipse.

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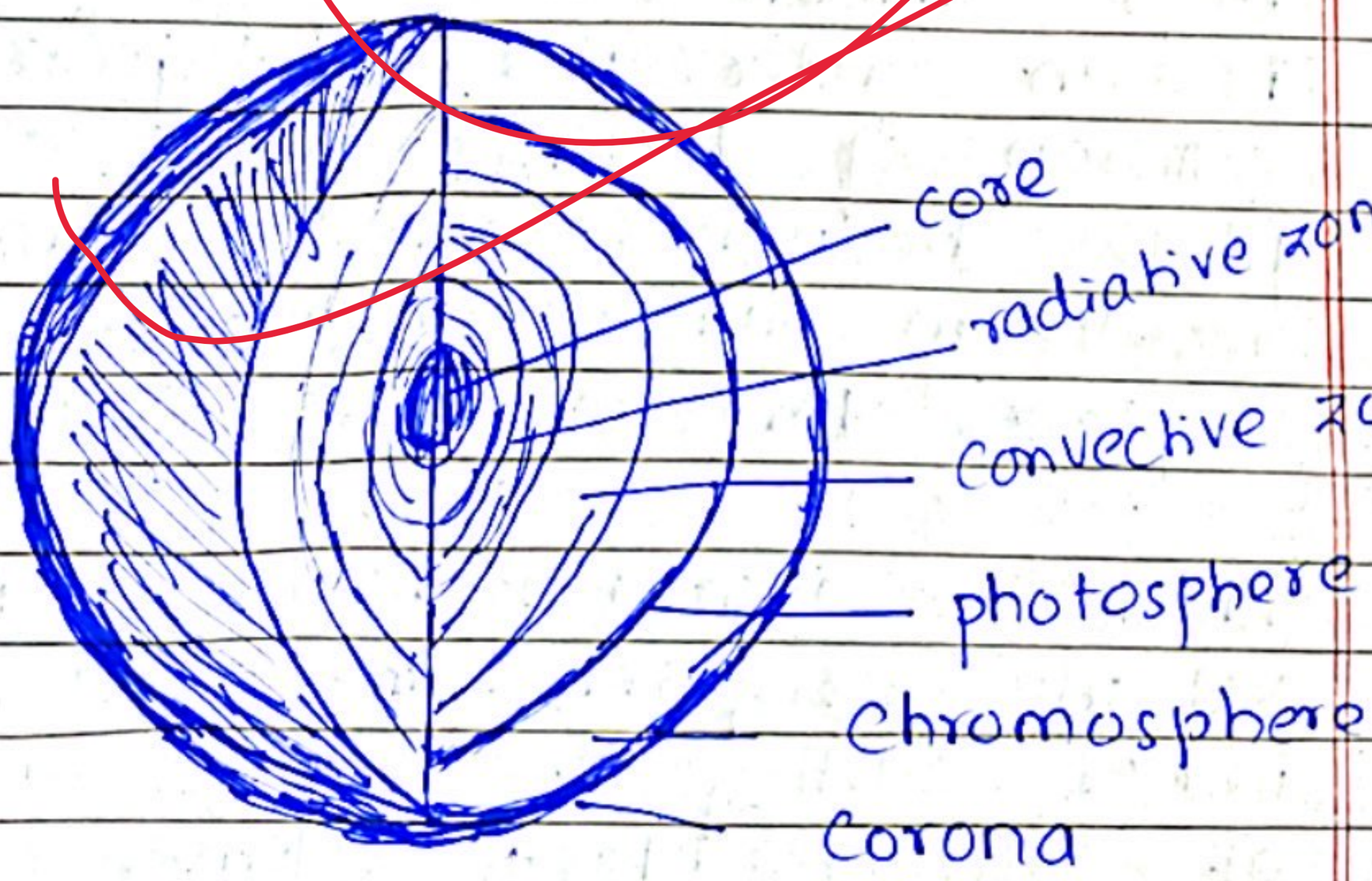
6. **Corona:** This is the outermost layer of the sun extending millions of kilometers into space. It emits X-rays and is visible as a bright halo in total solar eclipse. Temperatures can reach upto 3 million °C in this region.

Diagram:



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b.

Tsunami: A tsunami is a series of large ocean waves caused by the displacement of significant volume of water. These waves are trigerred by geological events such as underwater earthquakes, volcanic eruptions etc.

How is a tsunami generated?

1. Most common cause of tsunamis is an underwater earthquake. Collision of tectonic plates along plate boundries can sometimes result in subduction which displaces large volumes of water.

2. Another reason for tsunamis is volcanic eruptions. These cause minor earthquakes and can also displace large volumes of water resulting in a tsunami

3. Meteorite impacts can also cause a tsunami as ~~they~~ it causes a lot of damage and can generate massive waves.

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Example of recent tsunami:

In 2022, the Tonga Tsunami happened in the south pacific effecting Tonga and its nearby areas. The cause was a volcanic eruption and the resulting waves reached as far as peru.

(C)

Environmental pollution: The pollution of air, water and soil is called environmental pollution. In broader terms, environmental pollution is the harmful degradation of the physical environment. It started in the industrial revolution era and is currently posing a major threat to humanity.

Harmful effects:

1) Effect on human health:

The most serious threat posed by environmental pollution is to human health. Human beings

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are closely related to this environment. We depend on air, water and our food comes this soil. Microplastics in water sources, particulate matter in the air and toxic chemicals in the soil pose an existential danger to our present and future generations.

2) Effect on biodiversity:

Environmental pollution has resulted in a loss of biodiversity. Every year, a new specie of bird or fish goes extinct because of the complete distruction of their habitats.

3) Effect on economy:

Environmental pollution has a very high toll on national economies. In developing countries where there is limited fiscal space available to governments and there is lack of capacity to deal with environmental issues which further perpetuates the crisis

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Measures to curb environmental pollution :

1) **Institutionalization of sustainable practices** : It is important to institutionalize sustainable practices in all important areas such as construction, manufacturing and agricultural industry. This would limit further degradation and would help develop a habit of including environment in all buisness calculations.

2) **Strong regulatory framework** :

A strong regulatory framework is essential to create check and balance on industries and their operations. Simple and clear rules consistently applied would limit destructive practices. The goal is not to over regulate, but just do enough to create easily understandable do's and dont's in all practices.

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3) Shift to sustainable energy:

The biggest contributor to environmental pollution is the use of fossil fuels. Transitioning to clean energy sources such as solar energy would reduce the consumption of fossil fuels. This would have the added advantage of freeing up capital to address environmental problems.

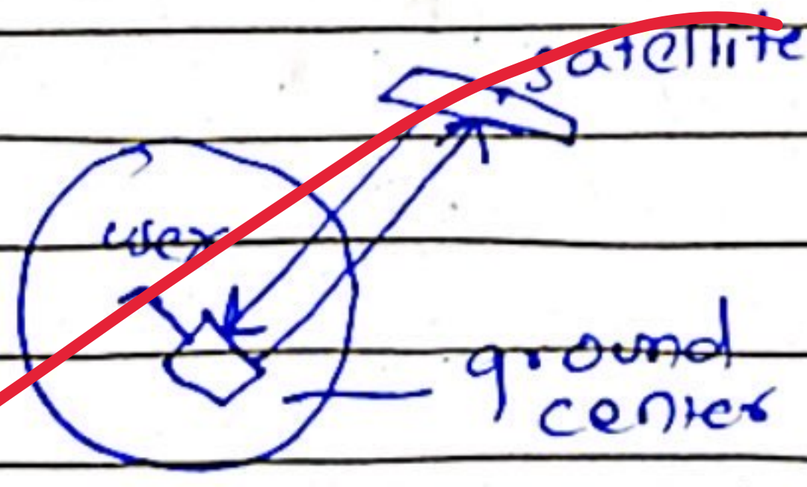
(d):

Wireless Communication:

Wireless communication refers to the use of electromagnetic signals such as radiowaves to carry information without relying on connected infrastructure.

Working of a Satellite

Diagram



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A satellite lies in low orbit and is used for communication purposes between various parts of the globe. It is characterized by a recieving antenna which receives a request in the form of a signal from a ground station. After processing the request, it relays the information to a different part of the world where a receiving antenna decodes the information and transmits to local computers or information systems.

Q 5:

(a)

Difference between Eukaryotic and Prokaryotic cells:

(1)	Eukaryotic cells have a well-defined nucleus enclosed in a nuclear membrane whereas prokaryotic cells donot have a well defined nucleus.

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(2) Eukaryotic cells are larger than prokaryotic cells.

(3) Eukaryotic cells have membrane bound organelles such as mitochondria whereas prokaryotic cells lack membrane bound organelles.

(4) Cell division in eukaryotes happen through mitosis and meiosis whereas in prokaryotes, cell division happen through binary fission.

(5) Examples of eukaryotes are animals, plants, fungi and protists. Examples of prokaryotes are bacteria and archea. So eukaryotic cells are found in more complex organisms while prokaryotic cells are found in simpler organisms.

The content is correct but its comparison. It's better ways to is to differentiate pro and eukaryotic cell by drawing a line between them.

Pro | Euk

eg: eg,

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(b):

Global Warming: The increase in global temperature due to the entrapment of heat by greenhouse gases such as carbon dioxide (CO_2) present in the earth's atmosphere is called global warming.

Due to rising emissions of carbon dioxide and other green-house gases, more and more heat is trapped in the earth's atmosphere resulting in worsening climate patterns and erratic weather patterns.

Kyoto protocol: The Kyoto protocol is an international treaty adopted in Kyoto, a city of Japan. Its purpose was to limit greenhouse gas emissions to combat global warming and climate change. It was a legally binding protocol covering major greenhouse gases such CO_2, methene (CH_4), Nitrous oxide, Hydrochlorofluorocarbons etc. The protocol wasn't ratified by the united states and major emitters were excluded from it.

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(C)

GIS:

GIS repers to the geographical information system employed and developed to handle spatial and attribute data in one integraled environment.

GIS allows for the analysis and integration of data obtained from various sources such as satellite or airplane imagery and superimpose it on live spatial areas of earth allowing for unique insights to be gained about various issues.

It is used to track land use in the form of urbanization or deforestation. It can be used to check water bodies and their surroundings. Two such measures are the NDTV and NBDT which helps in tracking urbanization and vegetation levels. by using composite imagery.

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(d).

Antioxidants: Antioxidants are substances used that help to protect cells from damage caused by free radicals.

1) Antioxidants neutralize free radicals by donating electrons preventing them from damaging important cellular component like DNA, proteins and lipids.

2) There are two types depending upon whether production occurs naturally or through food or vitamin supplements.

3) Sources of antioxidants are: fruit and berries.

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Section II :

Q: 6 :

(a)

Hundred ten unit

i) Given: $x + y + z = 15$ (sum of three digits is 15)

(ii) $y + z = 12 \longrightarrow$ (a) a

(iii) $y - z = 2$ ——— (a) b

To find, x, y, z
adding a and b

$2y = 14 \Rightarrow y = 7$

putting $y = 7$ in (b)

$y - z = 2 \Rightarrow 7 - z = 2$

$7 - 2 = z$

$z = 5 \longrightarrow$

so

$x + y + z = 15$

$x + 7 + 5 = 15$

$x = 3$

The number is 375

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(b)

Given: ratio of slices in small, medium and large pizzas is 2:3:4

In one small, medium and large pizza → ratio is $2x:3x:4x$

Total number of slices = 18 as each person gets 1 slice

so,

$2x + 3x + 4x = 18$

$9x = 18$

$\boxed{x = 2} \rightarrow$

So, Number of slices in each pizza

Small → $2x = 4$ slices

Medium → $3x = 6$ slices

Large → $4x = 8$ slides

Now,

Each slice weighs 40 grams

Total weight W_s (small pizza) =

$W_s = 4 \times 40 = 160$ grams

W_m (medium pizza) = $6 \times 40 = 240g$

W_l (Large pizza) = $8 \times 40 = 320g$

Total weight = $W_s + W_m + W_l = 720g$

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Price ⇒ Price of small pizza with 4 slices is 320 → given

Small ↙ price/slice = 320/4 = 80 Rs per slice

price of a medium pizza slice = 6 × 80 = 480 Rs

price of large pizza = 8 × 80 = 640 Rs

(assuming equal price per slice)

Total price = 320 + 480 + 640 =

1440

So, W_{Total} = 720 grams

$Price_{total} \propto \sum P_{small}^{large} = 1440$

(C)

d = 6 cm r = d/2 ⇒ 3 cm

To find: Area : A ⇒ πr^2

circumference, C = $2\pi r$

$A = 3.14 \times (3)^2 = 3.14 \times 9 =$ **28.26 cm²**

$C = 2 \times 3.14 \times 3 = 6.28 \times 3$ **18.84 cm**

3
3.14
1
6
28.26

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(d).

(i) 13, 24, 46, 90, 178, ____?

24 - 13 = 11
46 - 24 = 22
90 - 46 = 44
178 - 90 = 88

so, 88 x 2 = next number in the series + previous

176 + 178 = 354

88 x 2

178
90
88

(ii) 5, 6, 9, 14, 21, ____

6 - 5 = 1
9 - 6 = 3
14 - 9 = 5
21 - 14 = 7

∴ 9 → odd number series

so, 21 + 9 = 30

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Q: 8 : 2

(a)

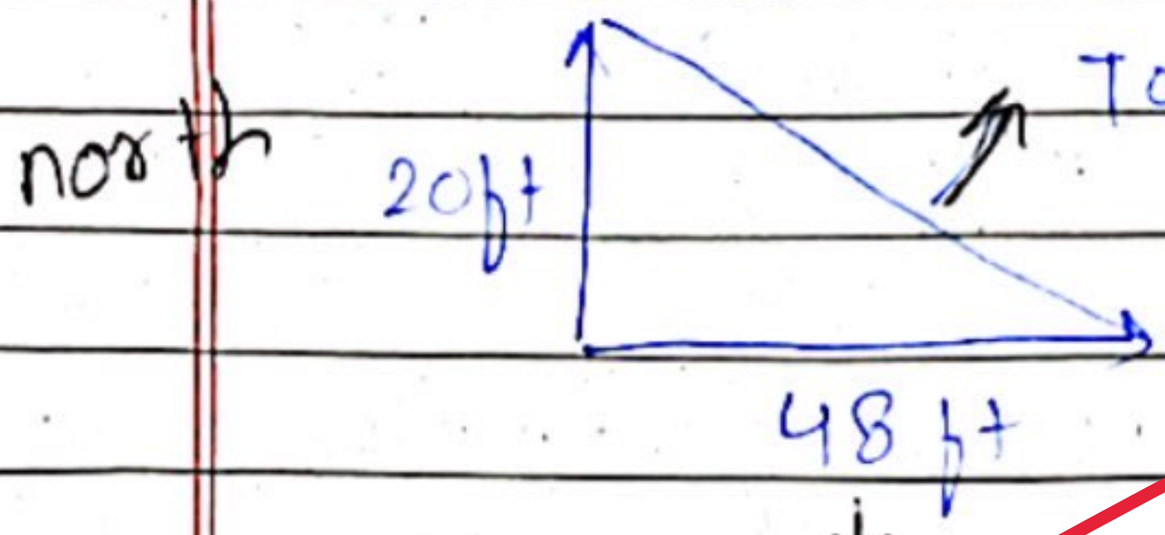
$l = 15$ ft

$w = 0.60 \times 15$ ft $\Rightarrow 9$ ft

$l = 15\frac{1}{2}$ ft $\quad w = 9\frac{1}{2}$ ft

$A = 138$

(b)



To find :

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

$x = \sqrt{(48)^2 + (20)^2} = \sqrt{2704}$

$X = 52$ ft

If Veena would have to run straight to the water station the straight line distance would be 52 ft.

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c.

Total marks = 52.15 × 40 = 2086

Correction = 85 − 49. 36

Corrected total marks. 2086 + 36 =
2122

Corrected Average = $\frac{2122}{40}$. 53.05

d.

Total number of people surveyed =
37 + 25 + 3 = 65

Number of people who like chicken
pizza = 25/65 → 5/13

probability in % of a radom
person liking chicken is

5/13 × 100 = 38.5 %