SECTION - B

Q. No. 7 (a).

Solution:-

Let first number be 'x' then we can write;

$$\frac{(x) + (x+1) + (x+2) + (x+3) + (x+4) + (x+5) + (x+6)}{7} = 20$$

Solving the equation

$$\frac{7x + 21}{7} = 20$$

$$\frac{7(x+3)}{7} = 20$$

$$x + 3 = 20$$

$$x = 20 - 3$$

$$x = 17$$

If $x = 17$ then the largest of these numbers would be;

$$x + 6 \rightarrow ①$$

$= $ put $x = 17$ in eq①
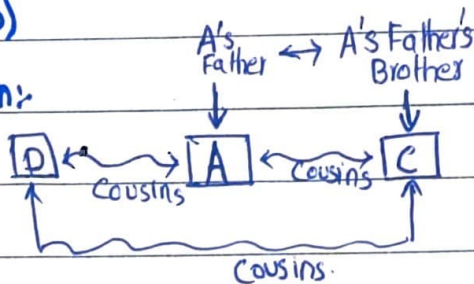
$$= 17 + 6$$

$$\boxed{= 23}$$

So, the largest number would be $\boxed{23}$

Q. No. 7 (b)

Solution:-

A's Father $\leftrightarrow$ A's Father's Brother

$$\boxed{D} \xleftrightarrow{\text{Cousins}} \boxed{A} \xleftarrow{\text{Cousins}} \boxed{C}$$

Cousins

As 'A' is cousin of both 'C' and 'D' but 'C' and 'D' are not brothers, so 'C' and 'D' are cousins.

Q. No. 7 (c)

Solutions:-

(i) 4, 18, ___, 100, 180, 294, 448

(ii) 1, 2, 10, 37, 101, **226**

(iii) 11, 17, 39, 85, **124**

(iv) 13, 24, 246, 90, 178, **354**

(v) 4, ___, 144, 400, 900, 1764

Q. No. 7 (d)

Q. No. 8(a)

Solution:-

Applying Pathagorous Theorem on $\triangle ABC$, we get;

$B = 10m, \quad H = 15m, \quad P = ?$

$\therefore \quad H^2 = P^2 + B^2$

$15^2 = P^2 + 10^2$

$225 = P^2 + 100$
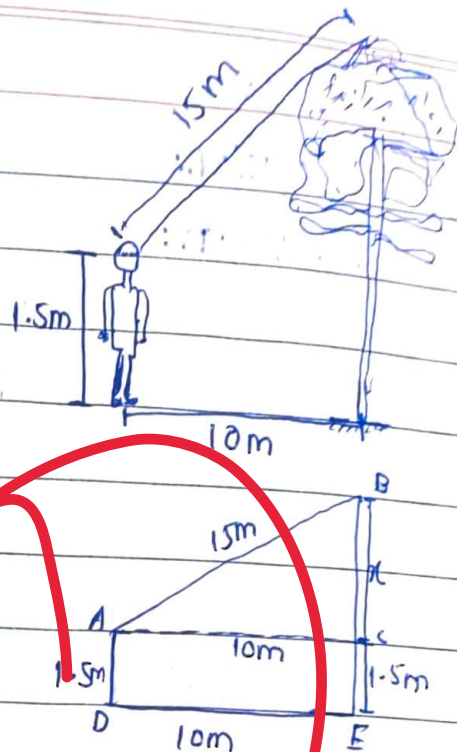
$P^2 = 225 - 100$

$P^2 = 125$

$P = \sqrt{125}$

$P = \sqrt{5 \times 25}$

$P = 5\sqrt{5}$

So, $x = 5\sqrt{5}$

As the height of the tree is $x + 1.5m$ so,
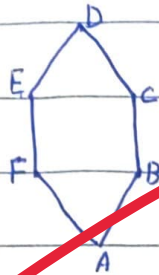
Total height $= (5\sqrt{5} + 1.5)m$
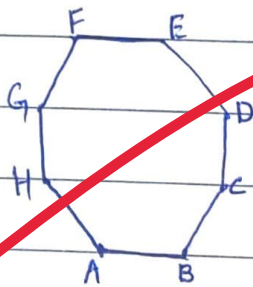
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Q.No.8 (c)
  Solution:-
  (i) Hexagon :-

Total number of lines of symmetry in a regular hexagon will be 06, i.e. $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DE}$, $\overline{EF}$, and $\overline{FA}$.
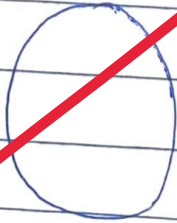
(ii) Octagon:-

Total number of lines of symmetry in a regular octagon will be 08 i.e. $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DE}$, $\overline{EF}$, $\overline{FG}$, $\overline{GH}$, and $\overline{HA}$.

(iii) Circle :-

There is no line of symmetry in a circle.
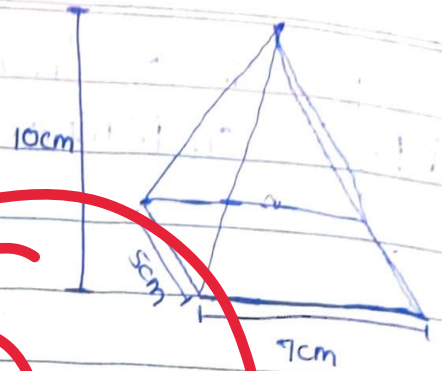
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Q.No. 8 (d)

Solution

Volume of pyramid = ?

$$Volume = \frac{1}{2}\left[l \times w \times h\right]$$

$$= \frac{1}{2}\left(7cm \times 5cm \times 10cm\right)$$

$$= \frac{1}{2}\left(350\right)cm^3$$

$$\underline{Volume = 175 cm^3}$$

Section A

Q.No. 5 (a)

Sea Surface Temperature Rise:-

Sea surface temperature rise refers as an phenomenon of rise in temperature of surface of sea due to global warming. As the temperature of the planet earth is increasing seriously, the temperature of sea is also increasing. From post industrial till now there has been an increase in temperature of about 1.5°c as stated by Intergovernmental Panel on Climate Change (IPCC). Due to the interferences by man in environment like burning fossil fuels and cutting trees the environment is responding badly. The effects of global warming include ~~radi red~~ rapid melting of glaciers, increasing sea level, and increasing temperature of sea.

Effects of Increasing Temperature of Sea:-

① Effects on Marine Life:-

Rise in sea temperature is badly affecting the marine life. As species under the water are more sensitive to hot temperature so they cannot survive in high temperature. This is a direct threat to the marine life. Recent reports about marine life specially fisheries show that about 70-80% of the fisheries are about to extinct when temperature rise will be above 3°C.

② Effects on Tropical Cyclones:

Rise in sea temperature is affecting the formation of tropical cyclones. As we know that warm water tends to evaporate and come on the surface of water. This process give a rise to the chances of cyclone formation. As this water possesses more energy can influence the process of cyclone formation.

Q. No. 5 (b)

Optical Fiber:-

Optical fiber is a device which is used to enhance or for better communication. It deals with the total internal refraction of light packets which carry information. As the speed of light is significantly high that is making it highly effective in communication and data sharing.
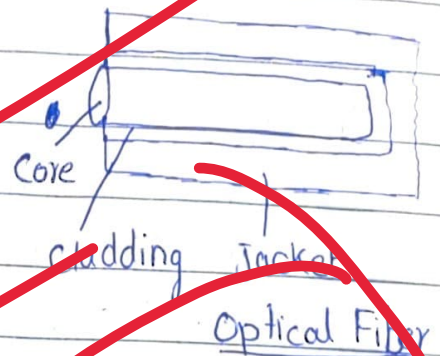
How Optical Fiber Works?

Optical fiber works on the principle of "total internal refraction". This principle allows it to communicate effectively without losing the information.

Optical fiber has a layer of glass which helps it to send light packets at a high speed.

Core is basically the main part which is a narrow hole. Light enters from one end of the core and transfer to the other. It is a glass structure which helps in total internal refraction.

Cladding is the support to the core and the glass structure. It helps in refraction and gives mechanical support.

Jacket is the outer cover and protects the core and cladding from external environment.

Core

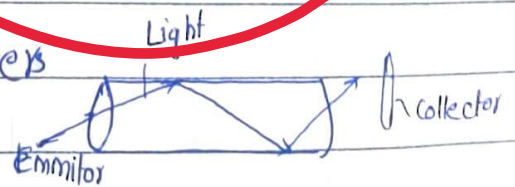cladding   Jacket

Optical Fiber

Process of Working:-

Light, containing information, enters from one end of the optical fiber. The angle is kept lower than 45° of the light to achieve total internal refraction.

After hitting the walls of the core light reaches the end of the optical fiber where it is collected and information is extracted from the light packets.

Light

Collector

Emmitor

Q.No.5(c)

Micro-organisms can help in meeting the current fuel shortage by helping in producing bio-fuels. Bio-fuels help us to reduce dependency on the traditional fossil fuels and mitigating the climate change. As these fuels are more environment friendly than the traditional ones. Micro-organisms are used in the production of fuels from the crop waste and animal dung.

The process includes the breakdown of organic waste with the help of micro-organisms. Bio-diesel, bio-petrol, and bio-gas are the main products which can surely be used to meet fuel shortage on one hand and to mitigate climate change on the other.

Bio-gas is produced through a very simple process of just mixing the dung with the water and then let the micro-organisms do their work for the break down of the waste. This can be used to meet the shortage of fuel without affecting the environment. Same like biogas, biodiesel and bio-petrol can be used to meet our energy needs.

The plus point of these fuels, which are possible with the help of micro-organisms, is their environment friendly behaviour.

So micro-organisms can help in meeting the current fuel shortage by helping in producing bio-fuels.

Q.No.5 (a)

(i) Food Additives:-

Every living organism needs food for its survival. Same is the case with the human beings. In the ancient times, when science was not properly grown, human beings used the same food they get without knowing its contents and formation. With the increase in the technology and intellectual ability, human came to know that every food does not contain each and every nutrient which is necessary for the humans.

This lead us to make such foods which atleast contain essential nutrients and components which are essential for human beings. Food additives is that material which is used in food industry to make the food more nutrious by adding nutrients. This process is essential to reduce hunger in the world. For this many additives are mixed in the food to make it more beneficial for the human beings.

(ii) Food Preservatives:-

Food preservatives are the materials and chemicals use to preserve the food for a long period of time. Due to over population and costomer demand these preservatives are used to make the food preserve against the micro-organisms, which are there to break down the food.

In ancient times, salt was used to preserve meat

for a long time, but due to science we are here in this stage that we can preserve & other foods including fruits, meat, and vegetables. Food preservatives work as a shield against the micro-organisms which are responsible for the breakdown of the food.

Q. No. 3 (b)

(i) Atmospheric Pressure and Atmospheric Temperature:-

Earth is surrounded by many gases like oxygen, nitrogen, carbon dioxide, etc. These gases are behaving like a blanket around the earth. Atmosphere is basically that blanket of gases. So any gases around us or earth is a part of atmosphere.

Atmospheric pressure refers to the pressure of gases around us. It is reciprocal to the velocity of gases around the earth. Which means if the velocity will be high atmospheric pressure will be low. Atmospheric pressure lowers with the increase in the altitude. We may experience higher atmospheric pressure on sea level than on the heights of Murree. It is basically the presence of gases around us. With the increase in height we may experience difficulty in breathening because of lower atmospheric pressure.

Atmospheric Temperature refers to the temperature of the gases around us. We are hearing a buzz term of global warming in 21st century. This global warming is basically the increase in the atmospheric temper

Atmospheric temperature depends on many factors including presence of greenhouse gases. These gases trap more heat which causes atmospheric temperature to rise.

(ii) Humidity:-

Humidity is the presence of water vapours in the air around us. Humidity is directly linked with the presence of water source in a hot weather, which causes more evaporation and hence more humidity. For example, we may face more humidity in coastal cities like Karachi or such cities having water reservoirs liks Mirpuk AJK than the cities like Islamabad or Rawalpndi. It is the pressence of excessive water vapours in the air.
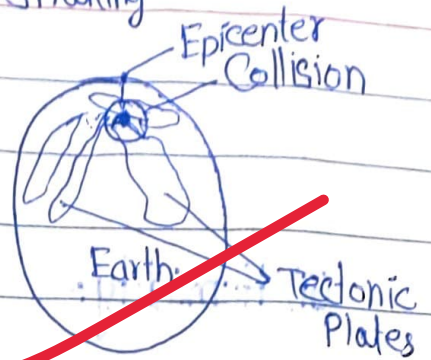
Q.No.3 (c)

Ephemeron of Earthquake:-

Earthquake is the uneven shaking of earth due to the movement and striking of tectonic plates with eachother. Earthquake lasts only for few seconds but can be extremely dangereous. Tectonic plates usually move under the surface of earth and it is a normal process, but when these plates collide with each other during the movement it causes earthquake. The depth of the earthquake varies from event to event because of the collision of plates at different points. These plates strike, or just touch other plate due to volcanic ejection

causes the earthquake to happen. This shaking of earth for a very short period of time causes a lot of damages.
For example, earthquake in AJK in 2005 was extremly damaging.
Earthquakes may also be caused by the ejection of volanos causing plates to move, and this uneven movement causes the collision.
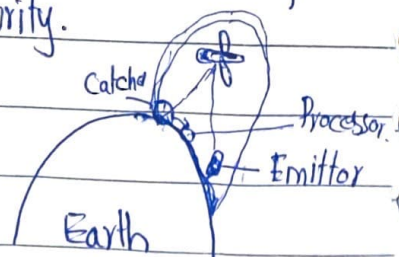

Epicenter
Collision
Earth
Tectonic Plates

Q.No.3 (d)

RADAR :-

RADAR is a technology through which we find the position and speed of a thing in atmosphere. RADAR is extremly beneficial in the defense systems of modern day states.

This uses the technology of throw and capture. It consists of 03 parts. First the signal emittor, second the signal catcher, and third the processor of that information. The emittor emits the signals and those signals after striking the uneven thing i.e. air craft in the atmosphere came back to the collector which collects the signal and passes those signals to the processor which gives the location and speed of that air craft. This is highly beneficial in today's security.
We have just experienced the "Iron Dome" technology of Israel. That technology is like RADAR but modern

Catcher
Processor
Emittor
Earth

and automatically driven.

Improve content
Make headings
 Keep length of all questions
equal
Draw flow charts and diagrams
and properly label it.
Use scientific terminologies
Use scientific examples

Some nswers are insufficient to
fulfill the required criteria of the
question and marks.

Follow appropriate structure for
answer according to the
question

  Ensure correct use of formulae