

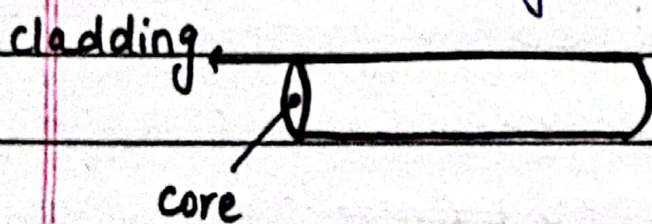
Q. a Explain optical fibre. Explain how Fibre optic communication works.

Optical Fibre:

An optical fibre is a strand of glass that is used to transmit data from one end to another. This strand of glass is thin like a hair strand and transmits data with the speed similar to the speed of light ($3 \times 10^8 \text{ ms}^{-2}$).

It consists of two parts:

- core
- cladding.



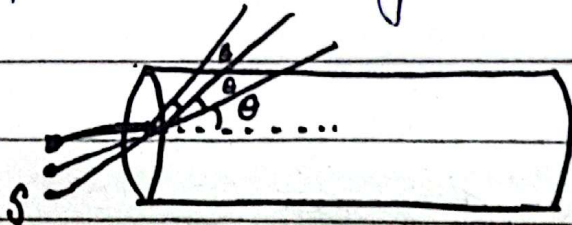
A core has high refractive index whereas the cladding has lower refractive index and density.

Function:

It's major function is transmission of data in less time.

Working of Fibre optic:

A fibre optic communication works on the principle of total internal reflection. When the light strikes the core-cladding boundary it bounces back with the formation of critical angle.



Where 'S' is the source of light and light rays are refracted forming angle θ . It is used in internet, telephone and television & as it gives greater ~~precise~~ and precise information in less time and is much more effective than the traditional copper wires.

Q:b Briefly explain the work^{ing} and structure of cell phone.

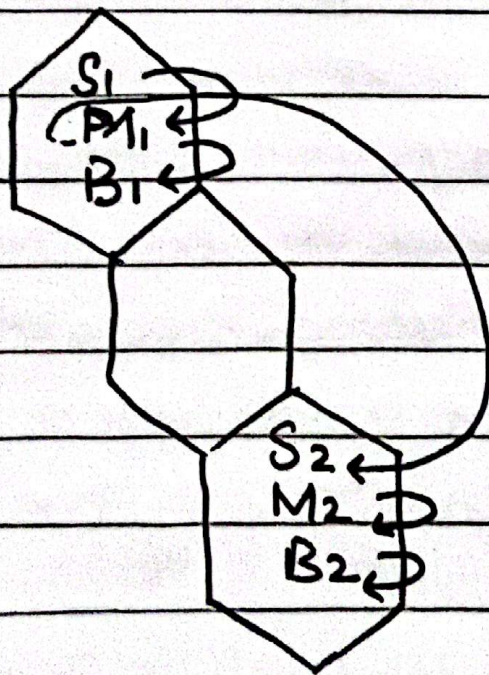
Cell phone:

Cell phone is a telecommunication device that is used to convey message from speaker to the listener. It has two components:

- 1) Mast
- 2) Base Station.

Working of Cell Phone:

Mast receives the signals and message. A base station carries and transmits the message from speaker to listener.



The words of speaker S_1 are received by M_1 which then transmits it to

- B₁. Then it turns the message to C₂; the listener and the similar process is repeated on the side of C₂.

Structure of Cell phone:

Cell phone was first used by Martin Cooper in 1973, the zeroth generation. It consists of three major components:

- 1) Networking
- 2) Modulation
- 3) Electromagnetic waves.

Networking: It is used for networking with the help of Mast and Base Station.

Modulation: It regulates the frequency of sound waves (frequency modulation) that are being transferred.

Electromagnetic Radiations: These are the radiations that do not require any medium for transfer/propagation.
i.e. sound waves.

Do: _____ Day: _____

c. Discuss the possible negative effects that Pakistan may face due to Global warming and Climate Change. What steps may be helpful to climatic change?

1. Negative Effects of Global Warming and Climate Change in Pakistan:

Pakistan is gravely affected by Global warming and Climate change. As according to UN Climate Report 2024 "Pakistan is the 5th most vulnerable country to climate change." Thus, this climate change effects the country adversely. The possible negative effects include:

1. Flash Flooding:

Pakistan experiences floods worth of its kind due to climate change. It is due to various reasons such as rising sea levels and glacier melt.

ing. The 2022 floods in Pakistan was one such tragedy which claimed the lives of thousands in the wake of climate change.

2. Human health risks:

Multiple diseases emerge as a result of climate change which are life-threatening. These include dengue fever, malaria and typhoid which are the most common ones.

3. Damage to plants and crops:

Due to irregular weather patterns, the intense heat carries the risk of locusts. They damage the crops and other fields leading to food insecurity. Moreover, the intense heat leads to fruits such as mangoes and others as being rotten or unripened.

4. Wildfires destructing the habitats and forest cover:

Date: _____

The extremely hot temperature in Pakistan results in heatwaves, leading to wildfires. These wildfires destroy millions of acres of the forest cover on land. These wildfires also lead to destruction of habitats of animals.

2. Steps to Mitigate Climate Inactions:

1) Reforestration and Afforestation:

The government and people in Pakistan should collaborate to plant more trees in order to reduce the effects of global warming.

2) Shift towards Renewable Energy Sources:

The power production should be done via renewable energy sources i.e wind, hydal, solar and biofuels rather than using fossil fuels.

3) Usage of e-Vehicles:

The usage of e-vehicles is should be

Date: _____

Day: _____

- prioritized to make the environment pollution free.

4) Effective Solid Waste Management:

Solid waste management through a regulated method is necessary for making the environment st. clean and green.

Q: Discuss vaccination, types of vaccines, their side effects and effectiveness.

1. Vaccination:

Vaccination is the ^{process} ~~pre~~ method of stimulating the body against a specific disease.

Vaccine:

A vaccine is an agent that strengthens the immune system and protects the body against any pathogen.

It was first given by Louis Pasteur in 1885 when a ~~4~~ year

Date: _____ Day: _____
boy was bitten by a rabid dog.

Types of Vaccines:

1) Live Attenuated Vaccine:

These vaccines employ live viruses and are not prescribed to be given to those with weak immune system.

2) Killed Attenuated Vaccine:

These employ vaccines killed viruses and are prescribed to those with weak immune system.

3) Toxoid vaccine:

Toxoid vaccines employ toxins of bacteria.

4) Conjugate vaccines:

It contains parts of bacteria ~~employed~~ added with proteins.

Side Effects of Vaccines:

The side effects after injecting

- a vaccine include:
- > Chills or irritation.
 - > Fever
 - > Fatigue
 - > Body pain
 - > Nausea

Effectiveness of Vaccines:

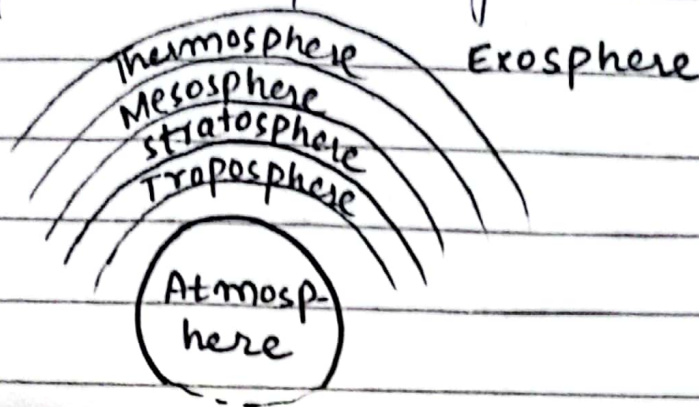
- i. Vaccines are effective as they strengthen the immune system.
- ii. They are helpful in reducing the risk of exposing to a particular virus or bacteria.
- iii. They reduce the risk of death.

Q29. What is the sequence of strata of atmosphere? and on what factors does it depends?

1- Sequence of Strata of Atmosphere:

The strata of atmosphere follow a particular sequence. The

four layers of atmosphere include troposphere, stratosphere, mesosphere and thermosphere. Exosphere is not the layer but a part of it.



Atmosphere:

Atmosphere is a mixture of gases surrounding the planet Earth.

→ Troposphere:

Troposphere is the first layer. Its length ^{height} ranges from 15-20 km above the earth's surface. It is a cold layer. It includes weather patterns, cloud formation, clouds are present here.

→ ~~Mesosphere~~ Stratosphere:

Stratosphere is the second layer. It goes up to 50 km from Earth's surface. It has 19-20% gaseous cover. It is a hot layer. It has ozone layer which protects life.

Date: _____ Day: _____

→ Mesosphere:

Mesosphere is the third layer. It goes up to 95km from Earth. It is the coldest layer.

→ Thermosphere:

Thermosphere is the fourth layer with an average height of 400km. It is the warmest layer. It involves ionization.

Factors affecting the strata of Atmosphere:

1) Temperature:

The temperature variations in the different layers of atmosphere affect them. Temperature increases while moving upwards, that is why thermosphere is the hottest layer.

2) Height from Earth's surface:

The height varies with each layer with respect to its distance from the earth's surface.

Date: _____

Day: _____

3) Gravitational Forces:

These forces pull gases closer to Earth, making the lower layers denser.

4) Solar Radiation:

The intensity of solar energy influences temperature changes and ionization in higher layers.

