

GISA MockSection II

V good
Good for math work
Good for theory
Enough length
Enough headings

Q6.

(a)

Votes for first candidate = 15000

Votes for second candidate = 10000

Votes for third candidate = 8000

∴ First candidate was

Total votes of all candidates =

$$15000 + 10000 + 8000$$

$$= 33000$$

% of winning candidate = $\frac{\text{Votes received} \times 100}{\text{Total votes}}$

$$= \frac{15000 \times 100}{33000}$$

$$= \frac{1500}{33} = 33 \overline{) 1500}$$

$$\underline{132}$$

$$180$$

$$\underline{165}$$

$$150$$

$$\underline{132}$$

$$180$$

$$\underline{165}$$

$$15$$

$$= 45.45\%$$

∴ The winning candidate got 45.45% of the votes

6(b)

Sum of all angles in a triangle = 180°

Ratios of the angles = 3:4:5

Each angle = ?

$$\frac{3}{12} \times 180 = 45^\circ$$

$$\frac{4}{12} \times 180 = 60^\circ$$

$$\frac{5}{12} \times 180 = 75^\circ$$

∴ The angles of the triangle with ratio 3:4:5 are 30° , 60° and 75° respectively.

6(c)

Boys in each group = 4

Girls in each group = 6

Boys required if 102 girls available = ?

Boys : Girls

4 : 6

 $x : 102$

$$6x = 102 \times 4$$

$$x = \frac{102 \times 4}{6} = 17 \times 4 = 68$$

∴ If there are 102 girls, 68 boys will be needed for the grouping.

6(d)

Ratio of present ages of A and B = 6:7

Ratio after 5 years = 7:8.

Present ages of A and B?

$$\frac{6x+5}{7x+5} = \frac{7}{8}$$

$$48x + 40 = 49x + 35$$

$$5 = x$$

$$6(5) = 30$$

$$7(5) = 35$$

∴ The present ages of A is 30^{years} and B is 35 years.

Q8.

(a) Sum of three consecutive odd numbers = 273
What are the 3 numbers = ?

$$\text{First number} = 2n + 1$$

$$\text{Second number} = 2n + 3$$

$$\text{Third number} = 2n + 5$$

$$\begin{array}{r} 273 \\ - 9 \\ \hline 264 \end{array}$$

$$2n + 1 + 2n + 3 + 2n + 5 = 273$$

$$6n + 9 = 273$$

$$6n = 273 - 9$$

$$6n = 264$$

$$n = \frac{264}{6}$$

$$= 44$$

$$\text{First number} = 44(2) + 1 = 89$$

$$\text{Second number} = 44(2) + 3 = 91$$

$$\text{Third number} = 44(2) + 5 = 93$$

\therefore The 3 consecutive odd numbers are 89, 91 and 93.

Q(b)(i) 4, 16, 36, 64, 100, 144

logic: square of consecutive even numbers.

$$2^2, 4^2, 6^2, 8^2, 10^2, 12^2$$

Q(b)(ii) 30, 29, 27, 24, 20, 15

logic: each number is minused by an ascending value by 1: -1, -2, -3, -4, -5

8(b)(iii) 1, 7, 15, 25, 37, 51

logic: each number is added by 2 started from the addition of 6 in the second number:
6, 8, 10, 12, 14 → order of additions

8(b)(iv) 0, 2, 6, 12, 20, 30, 42

logic: each number is added by 2 of the difference. The difference consecutive

logic: The difference between two numbers is added by 2 for the following number. Hence the difference increases by multiples of 2: +2, +4, +6, +8, +10, +12

8(b)(v) 48, 24, 72, 35, 108, 52

logic: The even^{position} numbers are half of the number before and then an increasing series of +1 follows: $\frac{48}{2} = 24$, $\frac{72}{2} = 36 - 1$

$$= 35, \frac{108}{2} = 54 - 2 = 52.$$

8(c)

(i) THRSI = SHIRT

(ii) GNDREA = DANGER

(iii) SCHAMOT = STOMACH

(iv) ONLNDO = LONDON

(v) HIODALY = HOLIDAY

8(d) &

$$\text{Sarah} = x$$

$$\text{Sarah's mother} = 6x$$

$$\text{Sarah's brother} = 2x$$

In 3 years the sum of their ages = 72

$$x+3 + 6x+3 + 2x+3 = 72$$

$$9x+9 = 72$$

$$x = \frac{63}{9}$$

$$x = 7$$

$$6x = 42$$

$$2x = 14$$

\therefore Sarah's age is 7^{years}, Sarah's brother's age is 14^{years} and Sarah's mother's age is 42^{years}.

SECTION IQ. 93(a)
Introduction

2023 was regarded as the hottest year according to ADB. This has severe negative impacts on developing countries with regards to global warming. In this answer the adverse impacts of global warming with regards to COP28 will be discussed.

Impacts of global warming and major
loss

Major hurdles in developing countries
to tackle global warming impacts

Lack of finance

Developing countries lack the financial capacity to tackle the impacts of global warming. For ensuring emergency measures and mitigation strategies this finance would be required but is not available in an adequate amount in developing countries.

Unwillingness of international community
to facilitate funds

The COP28's main goal

one of the main objectives of COP28 was the facilitation of loss and damage fund which has been inadequate. The pledges thus far have not been enough to help developing countries deal with global warming (Nasir Jamal, COP28: not up to scratch, 2023).

Population explosion

The developing countries hold the bulk of the world's population which is a burden to counter global warming. A larger population would need more resources and more efficient strategies which the developing countries would struggle with.

Lack of awareness

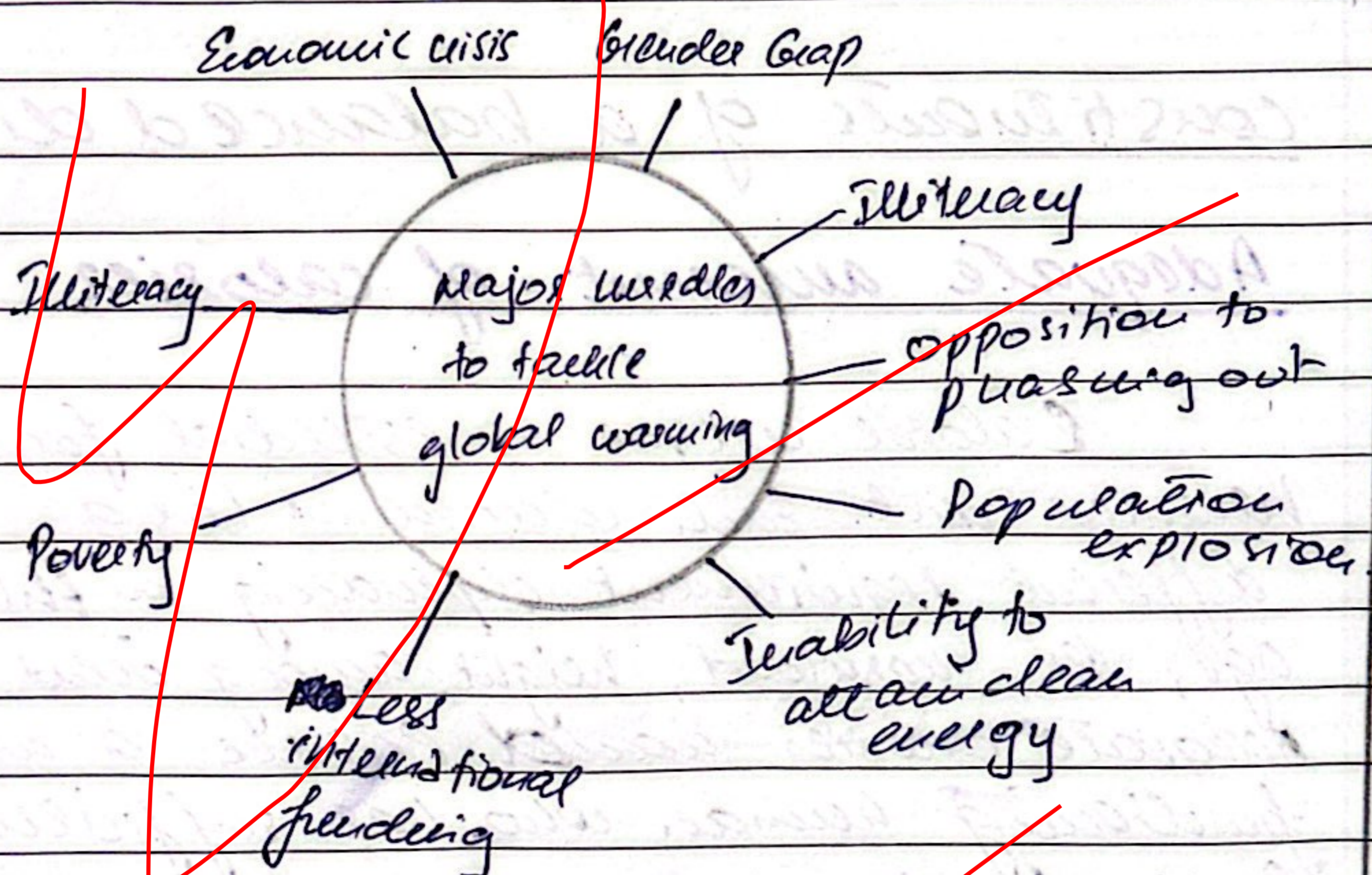
Many people in developing countries are unaware of global warming and its impacts which creates a burden. They are unable to adapt and protect themselves which poses an immense problem for developing countries.

Entrenchment of fossil fuels in energy sector and overdependence

Developing countries are deeply dependent on fossil fuels for economic progress. Their phasing out as prescribed

by COP28 would harm them detrimentally. They are not prepared to give it up which is a challenge and hurdle to tackle global warming.

Summary of major hurdles of developing countries



Conclusion

In conclusion, the major hurdles to tackle global warming by developing countries is discussed in light of COP28 which includes illiteracy, lack of funds and fossil fuel dependence.

3(b)

Introduction

A balanced diet is essential for human life to reach its full capacity. A balanced diet has constituents which include taking the correct amount of calories, macros and vitamins to sustain growth and maintenance.

constituents of a balanced dietAdequate amount of calories

Calorie intake is essential for a balanced diet. Each individual has a different requirement depending on their age, sex, workload, height among other things. Adequate calories would ensure a well-functioning human who has sufficient energy. For example, non-working women require less calories approximately 1800 compared to labour-intensive men who require 3000 approximately.

Intake of macros

A balanced diet needs sufficient macronutrients such which include carbohydrates, proteins and fats. These are required in a large proportion to ensure growth.

Intake of vitamins for adequate functioning

Vitamins are essential for chemical processes and are required for human body to function properly. Hence, vitamins A, B, D, E, and K and C are essential with each performing unique functions and working the body.

Why is balanced diet needed?

To fuel growth

Humans, particularly young people, need a balanced diet to grow. These requirements change with age and environment.

To maintain energy levels

A balanced diet is needed so that humans can keep up with their work and don't become tired. If a balanced diet is not maintained fatigue may be a result.

Conclusion

In conclusion, a balanced diet consists of both macro and micronutrients. Vitamins are also important for chemical processes. This leads to growth and nourishment.

3(c)

Introduction

It can be said that machine learning is a subset of Artificial Intelligence (AI) which has revolutionised today's world. This is because it has seeped into every facet of human existence and changed the way most tasks are carried out. The revolutionization of AI will be discussed.

Ways through which AI has revolutionised the worldResearch is made easier

AI has enabled hoards of information to be processed at record speed. This has led to research being done quickly and accurately. Thus, less time is spent on research and more on implementation.

Advancement in education sector

AI has revolutionised the education sector as many people are students are now able to learn difficult concepts through Chat-GPT-3. This has changed the traditional classroom environment as complex topics can be learned creatively through AI.

Revolutionization of the medical field

AI is now able to detect diseases through machine learning. For example, cancer was detected in patients by studying their radiographies and robots have also been used for surgical procedures in hospitals increasingly (Henry Kissinger, The Age of AI and Our Human Future, 2021).

Social interactions revolutionized

People are now depending on AI to meet their emotional needs. Humanoid robots such as Sophia are all being used for people who are socially isolated and need contact. Thus social interactions have been revolutionized.

Economic predictions

AI can predict and forecast economic instances such as project growth through forecasting techniques or advise on economic policies that would work the best for progress.

Military assistance through AI

AI has infiltrated into military operations. Increasingly the military

is using AI for strategies, for drone attacks and surveillance. For example, the Israeli military has an entire AI will called SIGMA which is used for military strategies and drone strikes in Gaza.

Conclusion

In conclusion AI has revolutionized today's world and through machine learning. But has positively impacted the many segments such as education and politics. But it has revolutionised some segments such as the military for the worse.

3(d)

Introduction

RAM and ROM are internal memory in a computer. They have several differences which will be discussed in this answer.

What is RAM?

RAM stands for Random Access Memory. RAM is temporary memory which is unlike ROM. RAM is an internal memory which is essential for the computer.

Temporary nature of RAM

RAM is only on the computer when it is switched on and will be lost when the computer is shut. Hence, it is not permanent.

Computer becomes faster with more RAM

If more RAM is added to the computer it becomes faster in its functioning. Hence, RAM can be changed and added.

Diverse functions of RAM

RAM can provide a broad range of functions. It is diverse in its ability and not restricted like ROM.

Can be altered and is changeable

RAM can be altered as it is not stored. RAM is writable and changeable.

What is ROM?

ROM stands for Read Only Memory. It is standard and rigid. It is also permanent memory essential to the

computer.

Permanent nature of ROM

ROM remains the same and even if the computer is shut off, this memory is not lost. Every time a computer is switched on ROM remains constant and has the same instructions.

Computer functions remain constant

ROM does not change and more of this memory cannot be added hence it has no impact on the speed of the computer.

Same functions and units of ROM

ROM has the same functions and does not change like RAM.

Comparison table of ROM and RAM

<u>RAM</u>	<u>ROM</u>
• Random Access Memory	• Read-only memory
• Diverse functions	• Constant functions
• Can increase computer speed	• No impact on computer speed
• Lost when computer switched off	• Stays the same as computer switched on
• Malleable	• Permanent and constant

Conclusion

In conclusion, ROM and RAM are discussed in detail and their differences are discussed in detail.

Q2a

Introduction

Volcano eruptions are natural disasters which can be due to tectonic activities. In Iceland a series of small earthquakes caused by tectonic activity ensued and later the volcano erupted. In this answer, ~~discussion~~ on volcano eruption will be discussed.

Process of volcano eruptionDivergent plate activity: rifting

Divergent tectonic plates lead to magma flowing on top of the earth's surface. This ~~flow~~ feeds the volcanoes which ~~are~~ ~~formed~~ eventually erupt due to built up pressure.

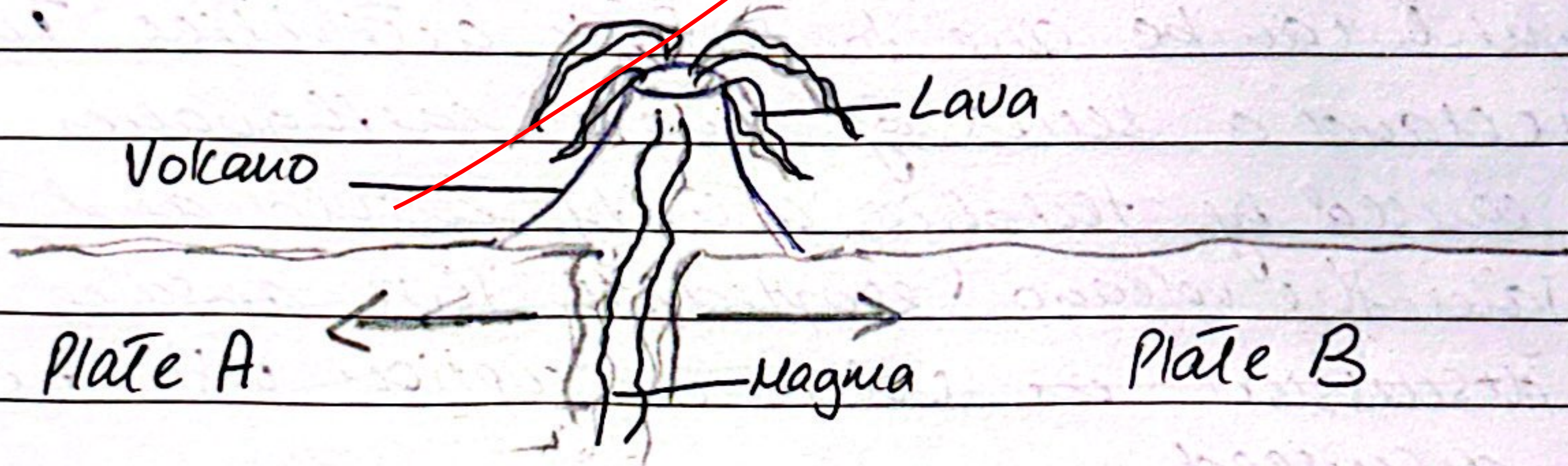
Subduction of plates and volcanic eruptions

↳ Tectonic plates can move towards



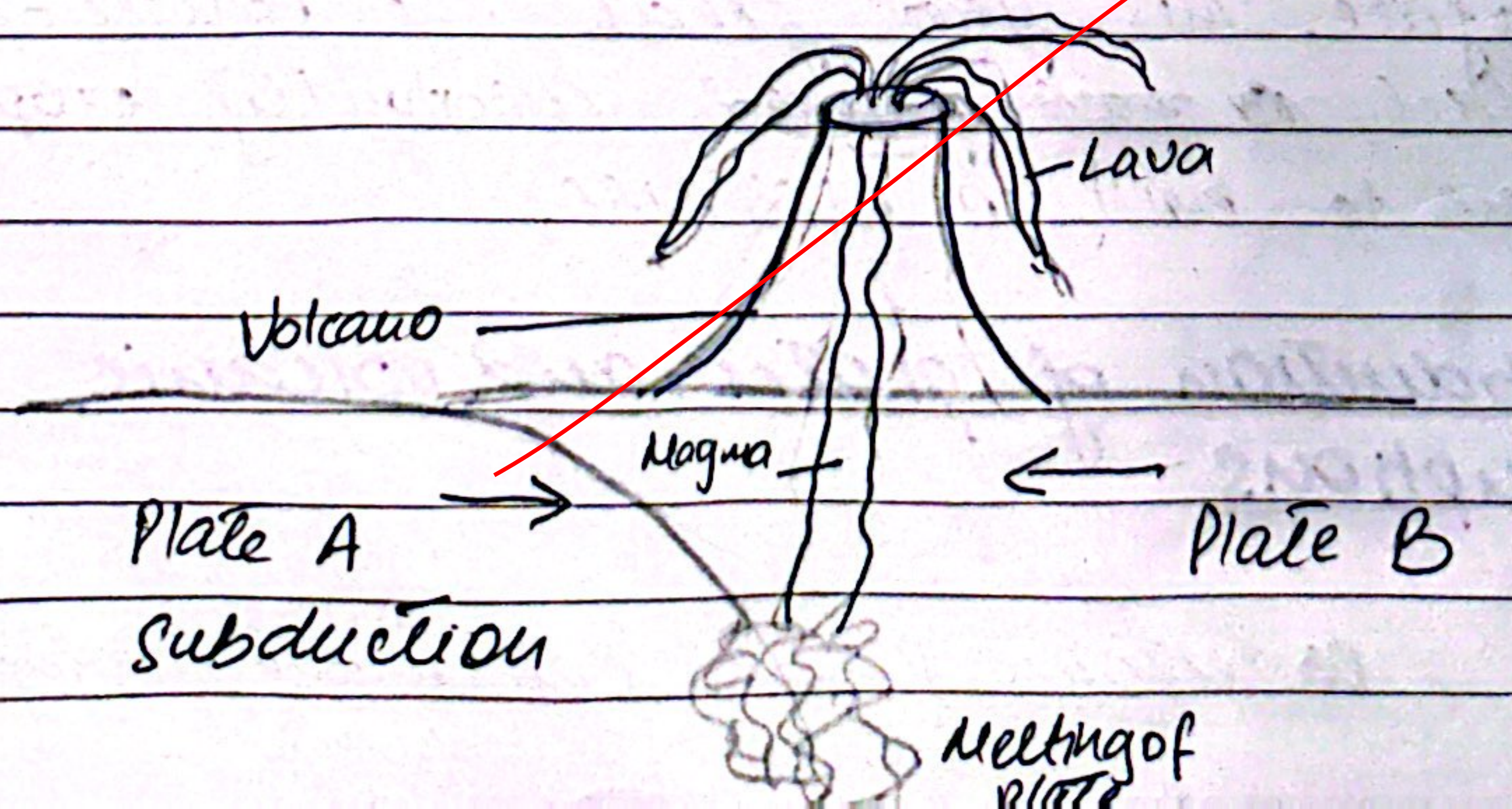
each other and one plate is subducted by the other as it ~~is~~ sinks below. Due to heat and pressure, it melts and feeds into a volcano. This can cause magma to accumulate and a volcano can explode as a result.

Diagram of rifting cause volcano eruption



Tectonic plates moving away from each other

Diagram of subduction causing volcano eruption: convergent plates



How volcanoes erupt

Consistency of magma if thick

If the magma is thick and sticky then the volcanic explosion may be more violent and may be thrown out of the volcano.

Volcanic eruption if magma is light

If the magma is light and airy then the volcano may erupt less violently. The magma which breaches lava on the earth's surface may flow out and flow on the sides of the mountain.

Conclusion

In conclusion, volcanoes eruption process, its ~~of~~ via subduction and rifting is discussed along with how it explodes.

Q2(b)

Introduction

The Big Bang is a theory that was devised to explain how the universe came into being. Big Crunch entails the opposite of the Big Bang Theory. The age of the universe is determined by looking at the cosmic microwave radiation and red wavelengths.

The Big Bang Theory

The Big Bang Theory was a theory to explain the starting of the universe. The universe came into being 13.7 billion years ago. This is ~~accepted~~

Singularity: origin of the universe

The singularity was a point that was smaller than a pinhead and was so hot and had pressure and heat unlike any other. This singularity was the origin of the universe.

The singularity explodes: the Big Bang

Due to the heat and pressure the singularity exploded. This led to the creation of the universe as we know it today. The universe is still known to be expanding.

Big Bang diagram

Singularity



Heat and pressure



Explosion (Big Bang)



Universe formed after

Big Crunch Theory

The Big Crunch Theory is that the Universe is not expanding but rather reducing in size. This would mean that the ultimate fate of the universe would be that it would shrink to its end.

Universe collapses into itself and ends

The Universe could reverse the expansion and ultimately collapse onto itself leading to its ultimate end.

Determination of the age of the universe

Observation of cosmic microwave radiation

Penzias discovered that the cosmic



microwave radiation can be used to study the age of the universe as it originates from the singularity - the origin of the universe.

Red wavelengths

The red wavelengths of the universe signify objects moving far away from the earth. They are all longer wavelengths and can be used to study the age of the universe.

Conclusion

In conclusion, the Big Bang Theory and the Big Crunch Theory are discussed in detail. This is followed by ways to study the age of the universe.

Q2(c)

Introduction

Renewable energy resources are those that do not deplete and can be used ~~constant~~ perpetually. In this article, 5 renewable energy ~~so~~ sources will be ~~assess~~ discussed.

Renewable Energy sources

Solar energy

Solar energy uses the light from the ~~to~~ sun to generate power. Photovoltaic cells are used to convert the sun's light into energy. These ~~to~~ cells are placed on panels which are called solar panels.

Wind energy

Wind energy is used through wind-turbines. Wind turbines consist of large blades that are moved by the power of the wind, when these blades turn, they ~~go~~ power a generator and produce electricity. Wind energy can usually be effectively utilized in coastal areas and on top of mountains or high altitudes.

Nuclear energy

Nuclear energy is a renewable energy that uses the power of nuclear fission. The nucleus in an atom is split which releases immense amount of energy. This can be used to produce electricity perpetually. France, for example, produces 70% of its energy through nuclear energy.

Hydroelectric power

Hydroelectric power is generated through the pressure of rivers. Usually hydroelectric plants are placed on downward slopes where there is a downward stream. The river moves with force and turns the turbines which power generators and produce electricity.

Tidal energy

Tidal energy utilizes the power of tides. The turbines are turned by the pressure of ocean or sea tides which power generators and produce electricity.

Conclusion

In conclusion, renewable

energy sources are discussed in detail?
u. This answer which are sources
that do not deplete.

Q2(d)

Introduction

820 km of optical fibres is laid down under CPEL so that communication is made easier and connectivity issues. Optical fibres uses internal reflection and is an efficient means of sharing and transferring data which will be discussed in this answer.

How does optical fibre work?

Use of glass in its body framework

Optical fibres are made up of glass that is essential for its functioning as it reflects light.

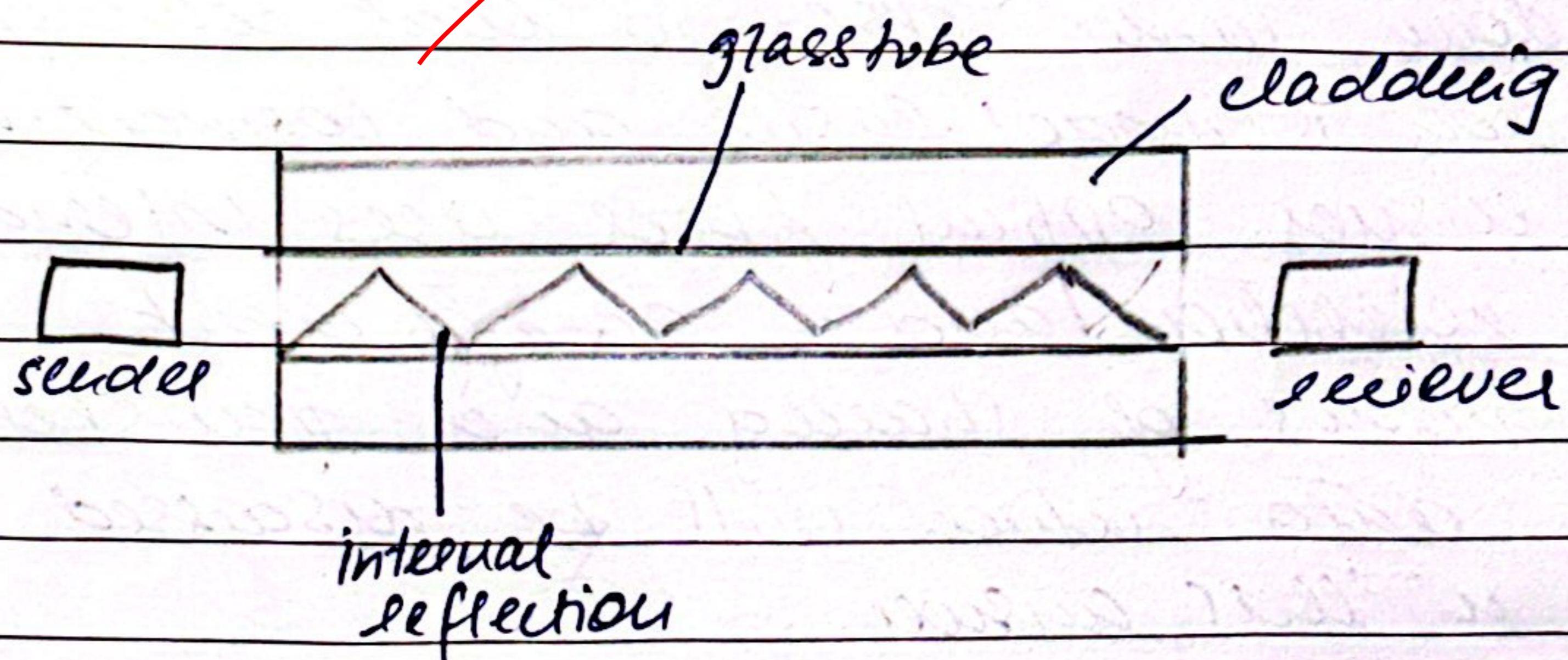
Phenomenon of internal reflection

The optical fibre uses the means of internal reflection which transfers data from the sender to the receiver via the glass tube.

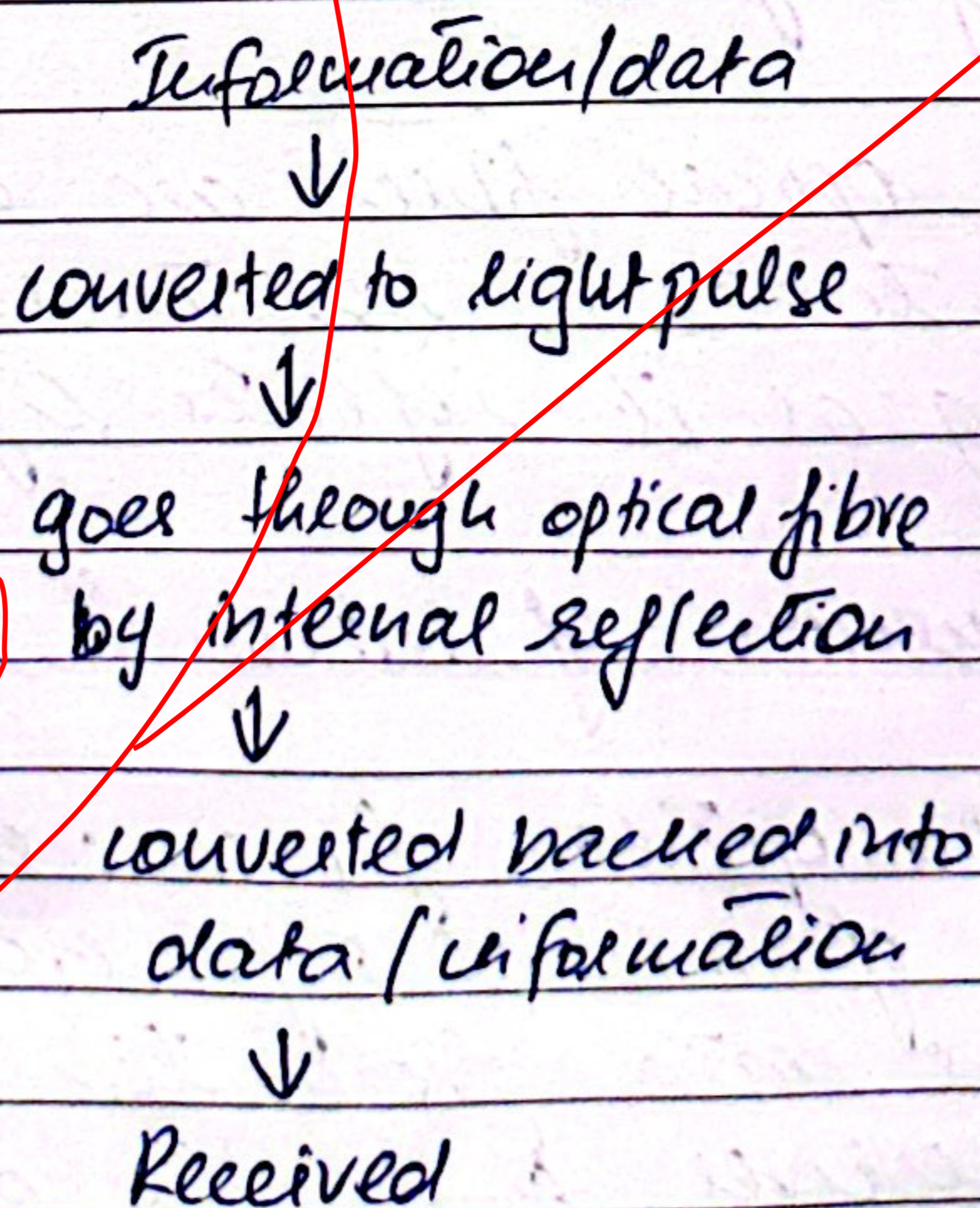
Data transferred via light pulses

The data is transferred via light pulse from the sender to the receiver and turns into data again when it is received.

Diagram of optical fibre



Flow diagram of how optical fibre works



Conclusion

In conclusion, the working of optical fibre is discussed in detail using a diagram. It uses internal reflection and light pulses to send and receive information.