

GISAGood
Enough length
Enough headings
Draw diagrams
Good for math workSection II

Q6.

- 6(a) Age of father 5 years ago $3x$
Age of son 5 years ago $= x$
Age of son now $= 30$ years
Age of father $= ?$

| | 5 years ago | Now |
|--------|-------------|--------|
| Father | $3x$ | $3x+5$ |
| Son | x | $x+5$ |

If son is 30 now

$$30 = x + 5$$

$$x = 25$$

$$\text{Father's age} = 3x + 5$$

$$= 3(25) + 5$$

$$= 75 + 5$$

$$= 80 \text{ years.}$$

 \therefore The father's age is 80 years.

6(b) Mean = average

$$\frac{10 + 30 + Y + 50}{4} = 50$$

$$90 + Y = 200$$

$$Y = 110$$

$$Y = 110$$

$$Y = 110$$

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Answer: \therefore The value of Y is 110

6(c)(i) 2, 6, 18, 54, 162

Logic: The difference between the ^{consecutive} next numbers is multiplied by 3 and added to the next in series

~~6-2 = 4~~

$$6 - 2 = 4, \quad 4 \times 3 = 12, \quad 54 - 18 = 36 = 12 \times 3$$

The next number is $36 \times 3 = 108 + 54$

$$= \underline{162} \text{ answer}$$

\therefore The next in the series is 162

6(d) Product of 2 numbers = ~~xy~~

$$xy = 320$$

6(c)(ii) 3125, 256, 27, 4, 1

Logic: Each number is multiplied by itself by as many times as the number is.

$$4 = 2 \times 2 \text{ (multiplied twice)}$$

$$256 = 4 \times 4 \times 4 \times 4 \text{ (multiplied four times with itself)}$$

$$3125 = 5 \times 5 \times 5 \times 5 \times 5 \text{ (multiplied five times with itself)}$$

In other words, The base and power of the numbers are the same in descending order

$$5^5, 4^4, \underline{3^3}, 2^2, 1^1$$

\therefore The number is 27 in the series

6(d) Product of two numbers = 320

$$xy = 320$$

$$\text{Ratio of numbers} = \frac{x}{y} = \frac{1}{5}$$

$$\underline{5x = y}$$

$$x(5x) = 320$$

$$5x^2 = 320$$

$$x^2 = \frac{320}{5} = 64$$

$$x = \sqrt{64} = 8$$

$$y = 5(8) = 40$$

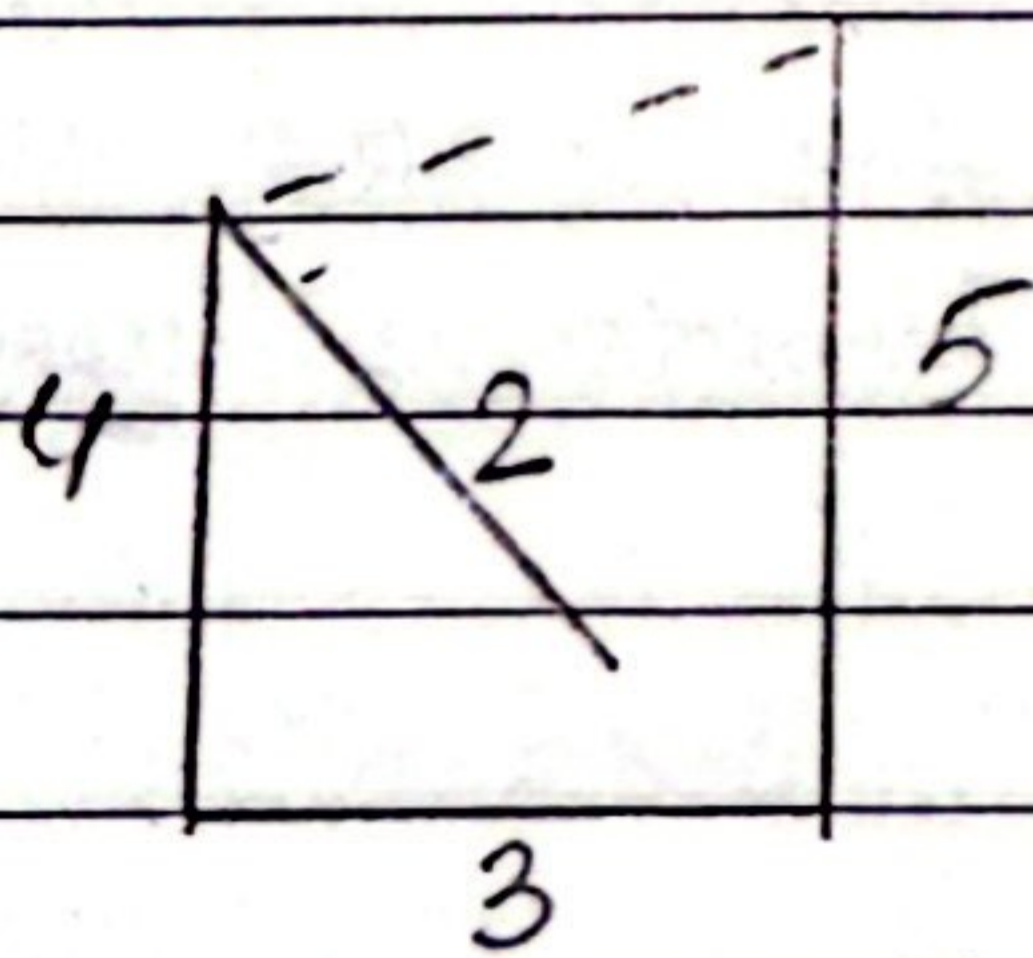
Squares of two numbers: $x = 64 = 8^2$

$$y = 1600 = 40^2$$

$$1600 - 64 = \underline{1536}$$

∴ The difference between the squares of the two numbers is 1536

Q8(a)



$$(4)^2 + (3)^2 = x^2$$

$$16 + 9 = x^2$$

$$x = 5$$

∴ See it is 5 km away from starting point

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8(b) Pizza slices = 8

Slices with raisins = 3.

Probability that Suza will pick a slice with raisins

$$\text{in it} = \frac{3}{8}$$

∴ The probability is $\frac{3}{8}$

8(c) There are 16 triangles in the figure

8(d) There are several factors which can affect the IQ. These include:
Genetics. One can be

8(d) There are several factors which can impact a person's IQ. Some of these factors are discussed below.

Genetics

A person's genetics or the traits naturally inherited from his/her parents influence IQ, which can be high or low.

Ethnicity/Race

An individual's race or ethnicity is said to influence his genetics such as being Caucasian or Asian or Black. A common belief is that Asians have a higher IQ.

Gender

An individual's gender also influences how high or low his IQ is. For instance, boys are thought to possess higher IQ in some scientific experiments.

Age

A person's age, whether young or old influences his IQ, with there being a correlation of IQ becoming higher with age and then declining after a certain point - during old age / senility.

Environment

An environment can influence IQ. For example, someone growing up in a nourishing and healthy environment may have a higher IQ.

Conclusion

Hence, IQ is impacted by several factors, some are mentioned above.



Section I

Q5(a)

Introduction

RAM and ROM are two different kinds of memory in a computer. Their distinguishing characteristics will be discussed. Moreover, Nibble and USB which are external memory devices will be discussed.

Distinguishment between RAM and ROMDifferences mentioned in name

ROM stands for Read-Only Memory whereas RAM stands for Random Access Memory. While both are internal memory, they have different capacities.

Flexibility of the two memories

Random access Memory is more flexible and changeable compared to Read only Memory. RAM can be added and changed in isolation but ROM is unchanging and inflexible.

RAM can be lost but not ROM.

RAM is temporary memory so it can

be lost but ROM is essential and permanent. Hence, ROM cannot be lost. Once the computer is shut, RAM will cease but ROM remains the same everytime the computer is opened.

More activity in RAM compared to ROM

More can be done with RAM compared to ROM. RAM has a greater scope and can be given more instructions. However, ROM is rigid and only performs a few tasks.

Computer made faster with RAM compared to ROM

More RAM can be bought separately compared to ROM. RAM can make the machine faster whereas ROM cannot be altered and remains the same.

Definitions of USB and Nibble

What is a USB?

A USB is an external memory device which can be plugged into different devices. Data can be saved onto a USB and physically can be accessed on another device by plugging that

USB through the USB port. The memory capacity of the device comes in various sizes. A USB is small and can easily be transported. It stands for Universal Serial Bus.

What is Nibble?

Nibble is another external device that can be carried easily. The storage capacity also varies.

Conclusion

Hence, the distinguishing characteristics of RAM and ROM are discussed. Followed by definitions of Nibble and USB.

Q56

Introduction

AI is a new invention which has revolutionized the world at immense speed and great scope. It has penetrated every field of existence, including military, politics, education, health etc.

humanoid.

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Revolutionization of the world by AI

Deep impact on military

AI has been able to conduct autonomous attacks through drones. Moreover, through AI military strategies are conducted with great precision and accounting for all most (if not all) scenarios. Thus, winning battles and wars has been made easier through the strategic capabilities of AI. This is discussed in Henry Kissinger's book, *The Age of AI and our Human Future* (2021)

Aiding students in education

Students are able to use AI for help in their assignments and for research by tools such as ChatGPT. These tools help reduce research time and provides visual and audio aids to understand complex topics. These are used as auxiliary tools by students as discussed in a TedTalk - *Should we let students use ChatGPT?* by Natasha Beech.

Helping in the health sector

AI is being used to figure out cures for diseases by parsing different

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combinations of proteins. Moreover, operations and procedures are all being tested to be performed by AI powered robots which will lead to precision and has already revolutionized the ~~the~~ wealth sector.

Help in domestic chores

AI has facilitates humans to forego boring and monotonous home chores and focus on more complex tasks. AI powers entire households through smart lights and fans along with smart appliances that can be activated through voice command. Hence, AI has made life at home easier.

Social relationships and company during loneliness

AI has helped in reducing loneliness and increased social interaction among people. AI has led to different chatbots that can have real conversations and make suggestions such as those invented by Google and Instagram. Moreover, humanoid robots have been developed for physical company and to perform tasks such as Sophia - a humanoid robot created by Hanson Robotics in 2016.

Facilitation in politics

AI has helped construct election campaigns and slogans/manifestos for effective campaigning during elections. It is also used to give speeches in some cases such as the recent use of AI for Imran Khan's speech while he was still in jail. Hence, politics has been revolutionized through AI.

Easier research and efficiency

AI has led to research being more less time-consuming and more targeted. Questionnaires and interview questions can be developed using AI in a few minutes as opposed to manually which may take several hours.

Conclusion

All in all, AI has revolutionized the world in every capacity and transcended every field of human existence. Tasks that were previously monotonous are easier and scope of sectors such as the-military has increased through AI.

Q5(c)

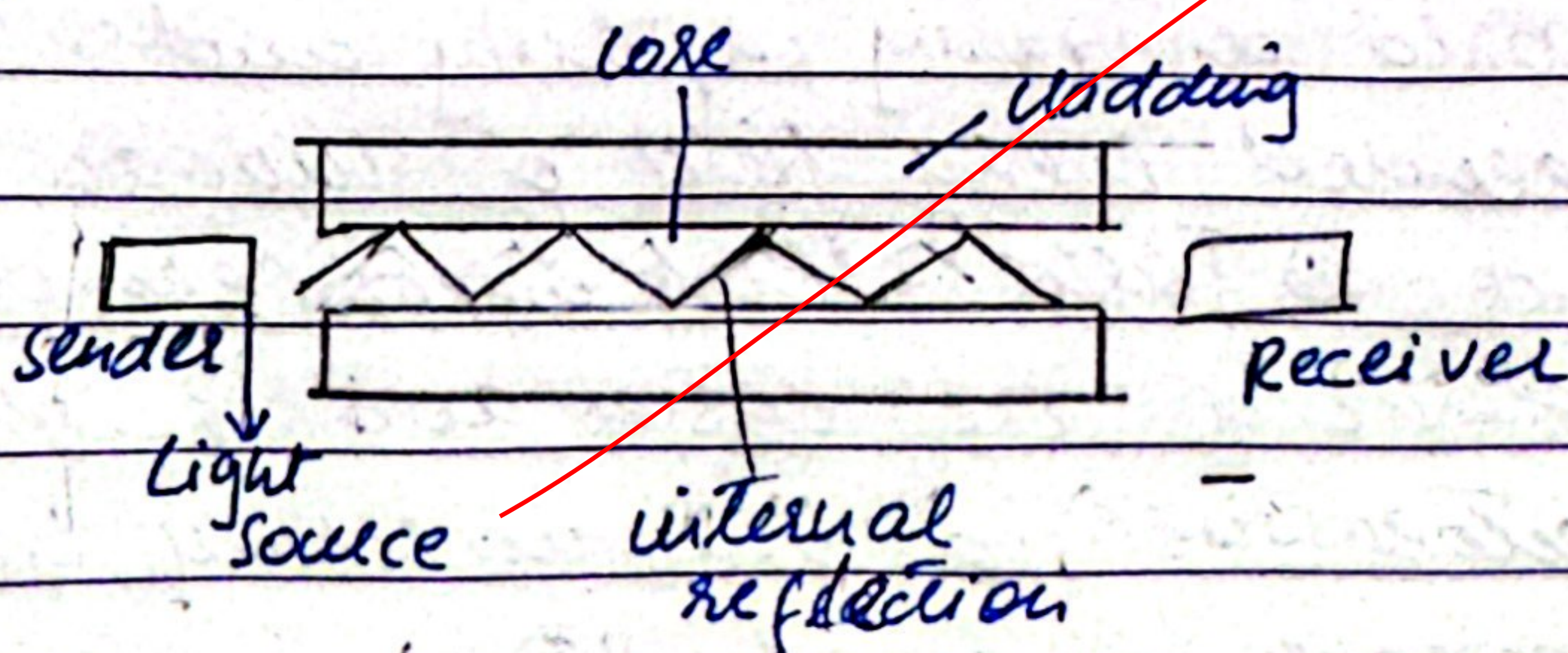
Introduction

Optical fibre cable is a ~~simple~~ way to transmit information using light pulses.

It has proved to be advantageous in many different ways. This will be discussed in the answer below.

How does an optical fibre work?

The optical fibre is made up of a glass tube which utilizes internal reflection to transmit data from one point to another. The data enters from one end of the tube and is converted into light, this light follows a zigzag pattern to the receiver which receives the light and converts it back into data.

Diagram showing the working of optical fibre

Advantages of optical fibre

Travel over long distances

Data can travel over long distances if single-mode optical fibre cable which is ~~not~~ beneficial.

Strong structure

Optical fibres consist of the core then the cladding which covers the core. Followed by the coating for added protection and then an extra jacket. Overall, the optical fibre is a strong structure which is difficult to break.

Cheap production

Optical fibres ~~are~~ are cheap to produce as all materials are available in ample amount. ~~As~~ For instance, glass and plastic are available in abundance and they are cheaper than metal used in normal wires.

Low weight

Optical fibres are not heavy and

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can easily be transported

~~MS to~~ Low power loss

Optical fibre follow the ^{total} internal reflection which ensures that power is not lost in the process.

Conclusion

In conclusion, the optical fibre is discussed above in detail followed by its advantages.

Q5(d)

Introduction

Critical speed of a satellite ~~to~~ will be discussed in this answer. Moreover, Geo-stationary and Polar-stationary satellites are two different types of satellites which will be highlighted.

Critical speed of a satellite

Critical speed of a satellite is the minimum speed required for the satellite to remain in

earth's orbit. This ensures the satellite does not fly away into space or fall to the ground on earth's surface.

Difference between Geo-stationary and Polar Satellites

Geo-stationary satellites

Geo-stationary satellites are also called Geo-synchronous satellites which orbit around the orbit of the earth. It takes one day for the satellite to complete its orbit so that it appears to be located at a fixed point in space. It is above the earth's atmosphere. Moreover, it drifts to the north and south due to it not being highly impacted by earth's centripetal force.

Polar satellites

Polar satellites stay over the north or south pole. They are closer to the earth surface and the centripetal force keeps them in one place. It takes about 90 minutes for them to complete an orbit.

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Comparison Table

Geo-stationary satellite

- High Earth orbit
- Follows earth's rotation - 24 hours for orbit
- Moves north and south
- 35786 km from earth's surface

Polar satellite

- Low Earth orbit
- 99 minutes to orbit earth
- Stagnant at poles
- 160 - 2000 km from earth's surface

Conclusion

Hence, the difference between the two satellites was discussed along with the critical speed of a satellite

Q

Q2a

Introduction

The COP28 centred around the loss and damage fund along with some financial issues faced by developing countries. These aspects will be discussed in this answer.

Features of The Loss and Damage Fund of The COP28

Agreement on provision of financial assistance

It was collectively agreed that the developed world, largely responsible for climate change would gather financial resources for the developing world in order to make them climate resilient and pay for the damages of climate change.

Investment in Clean Energy

There would be greater investment in clean energy such as solar and wind to facilitate a green transition away from fossil fuels. by the developed industrialised countries to the developing countries.

Investment in Disaster Management

The developed world will also facilitate the developing world by developing their Disaster management facilities to combat future climate disasters.

Need for fund in struggling economies Other financial issues of developing countries

World recession

Developing countries are struggling in a global recession and are unable to look after their need to adapt to climate change. Financial impacts include a lower BoP (Balance of Payments) and Trade deficits that ensure that climate change is not a priority sector for local investment.

Inflation breeds

Increased inflation has caused deep financial woes for the developing world which is unable to afford basic needs let alone adapt to climate change.

Financial distress from past climate disasters

Countries in the developing world are ~~struggling~~ struggling to keep up with the changing climate. Every disaster is more intense than the last with them really struggling. For example, Pakistan is still struggling ^{from} with the after effects of the floods of 2022.

Conclusion

In conclusion, the loss and damage fund is hailed as a great victory for the developing world (Ajaz Ahmad, A triumph for the global south, 2023). Moreover, some financial problems of the fund for developing countries are discussed.

Q2(b)

Introduction

Solid waste management is a process to handle waste which will be highlighted. Moreover, different methods of solid waste management will also be discussed.

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Definition of Solid Waste Management

Solid waste management is a process that starts from when the waste is formed till the final stage of its disposal or utilization. The usual process is that solid waste is produced then collected followed by sorting then disposal or reuse/recycle. ~~Do this~~

Different methods of solid waste management

Collection and disposal

The simplest method is to collect waste from one or multiple locations and dispose it in a pre-determined site.

Incineration

Solid waste can be burned so that there is no solid left. It could be burned in an incinerator to prevent smoke from remaining low in the atmosphere.

Waste waste-to-energy conversion

Waste can also be used for energy. The smoke that results from burning waste can be used to turn turbines to produce electricity.

Recycling

Solid waste can be recycled for example plastic and paper can be reused for packaging among other things.

Composting

Organic waste can be used for composting and used as fertilizer later on when in agricultural sectors.

landfill method

Solid waste can be filled in the ground by first having a plastic sheet at the bottom, followed by a leachate collection method and a gas pipe to ensure that there are no explosions in case of a spark. This is the most common method.

Conclusion

In conclusion, Solid waste Management was discussed followed by methods of solid waste management.

Q2(c)

Introduction

A balanced diet is one that fulfils the nutritional needs of an individual. The features of this diet will be highlighted.

Constituents of a balanced diet

Nutritional needs met

The nutritional needs of a balanced diet should be met. This looks at the person's age, gender, weight, height, workload and determine what nutrition is needed.

Special case for macros

Macronutrients are vital for a balanced diet which include carbohydrates, proteins and

fat and oils

vital needs of vitamins

A balanced diet looks at the vitamin need and ensures there are no deficiencies in an individual.

Maintenance of healthy energy

A person with a balanced diet would have enough energy to function. Hence a balanced diet ensures that one is able to maintain his energy throughout the day.

Avoidance of over consumption

A balanced diet ensures that one does not go over the set requirements of calories and nutrition. Hence, problems such as obesity and diet is avoided.

Conclusion

In conclusion, a balanced diet ensures the proper functioning of an individual by

meeting her food needs

Q10

Q2d

Introduction

CPEC has invested into the renewable energy sector which includes solar, wind and hydel energy.

Investment in Renewable Energy by CPEC

Solar Energy

CPEC has invested in a solar park as part of its energy investment. This park is in Bahawalpur and is called Dawood-e-Azam park. This is to meet Pakistan's energy needs.

Wind Energy

Wind energy has also been invested in which harnesses the energy of wind to turn the blades of a wind turbine and produce electricity. These have been invested in along the coast of Pakistan in Sindh and Balochistan.

Hydel power

CPEC has also invested in Hydel power projects which include projects in the northern areas. These utilize the pressure of rivers and streams to turn turbines to produce electricity. This is to meet the energy needs of Pakistan.

Conclusion

In conclusion, CPEC has invested in the renewable energy sector including solar, wind and hydel sectors.