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General Science and Ability

Section - II

Q: No: 6

Part: a

Solution:

Given data: Five years ago the age of father = Thrice of son age.

Son's present age = 30

To Find: Present age of the father.

Let suppose the present age of father and son is devoted by "x" and "y" respectively.

	5 years ago	Present Age
Father	$x-5$	
Son	$y-5$	$y=30$

According to the given data

$$x-5 = 3(y-5)$$

$$x-5 = 3y-15 \longrightarrow (i)$$

By putting the value of "y" in equation (i)

$$x - 5 = 3(30 - 5)$$
$$x - 5 = 3(25)$$
$$x - 5 = 75$$
$$x = 75 + 5$$
$$\boxed{x = 80}$$

Hence, present age of father is 80 years

Ans.

Part : b

Given data: Mean of 10, 30, y, and 50 is 30.

To Find: the value of y.

Solution:-

As Mean-formula is

$$Mean = \frac{Sum\ of\ numbers\ or\ amount\ or\ values}{No.\ of\ values}$$

By applying this formula.

① In the given data, there are total four values and their mean is 50.

Hence by applying values into formula we get:

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

$$200 = 90 + y$$

$$200 - 90 = y$$

$$\boxed{110 = y} \text{ Ans}$$

Hence, the value of y is 110.

Part: C

Missing terms:

i) 2, 6, 18, 54, __162__.

Solution: True every term in the given data is multiplied to '3'. For example, $2 \times 3 = 6 \rightarrow$ the 2nd term, $6 \times 3 = 18 \rightarrow$ 3rd term, $18 \times 3 = 54$ 4th term. On the same pattern the 5th term will be $54 \times 3 = 162$. Thereby, answer is $\boxed{162}$

(ii) —3125, ~~226=256=4.2~~†

3125, 2~~06~~~~5~~ ——————, 4.)

Part:d

Given: Product of 2 numbers = 320

Their Ratio 8 = 1:5

To find: Difference between of squares of two numbers.

Solution: let suppose the 1st number is 'n' and the other number is 'y'.

Hence, by applying the supposed values we'll get:

Product of two numbers = 320

$$\Rightarrow \quad x \cdot y = 320$$

$$\therefore \quad xy = 320 \quad \rightarrow (1)$$

Similarly,

Ratio of two no. = 1:5

$$\Rightarrow \quad x : y = 1:5$$

$$\Rightarrow \quad \frac{x}{y} = \frac{1}{5}$$

$$\therefore \quad x = y/5 \quad \rightarrow (ii)$$

By putting value of (ii) into (i)

$$y/5 \cdot y = 320$$

$$\boxed{y^2 = 1600} \quad \text{square of the } 2^{nd} \text{ number}$$

- By taking square root we'll get the value of 'y' and so by putting value we'll get 'x'.

$\rightarrow$ Taking square roots of both sides

$$\Rightarrow \quad \sqrt{y^2} = \sqrt{1600}$$

$$\boxed{y = 40} \quad \rightarrow (9)$$

By putting value of 'y' from (a)
into eq- (ii)

$$x = \frac{40 - 8}{4}$$

$$\boxed{x = 8}$$

As we have to find difference of squares; thus, we need x^2.
Thus, we take square of both sides

$$(x)^2 = (8)^2$$

$$\boxed{x^2 = 64}$$

The difference of two squares will
be $= y^2 - x^2$ or $x^2 - y^2$

By putting values

$$\text{,, ,, ,,} = 1600 - 64 \quad \text{or} \quad 64 - 1600$$

$$= \boxed{1536 \quad \text{or} \quad -1536}$$

<u>Ans.</u>

Part :a

Given: women sold two scooties for 96000 each.

For the first scooty profit gained = 20%

In the 2nd loss incurred = 20%

To Find: loss or gain in total.

Solution:

let suppose the original price of 1st scooty is 'x' and the 2nd is 'y'. To find the total gain or loss 1st we need to find original values of scooties. ~~This~~

As % loss and % profit formulae are:

$$\% \ Loss = \frac{Original \ price - Sold \ price}{Original \ price} \times 100 \rightarrow \underline{A}$$

Similarly,

$$\% \ Profit = \frac{Sold \ price - Original \ price}{Original \ price} \rightarrow \underline{B}$$

Thus, 1st we find to original value of 1st scooty 'n' which gained 20% profit.

By putting data of 1st scooty in equation B

$$20 = \frac{96000 - x}{x} \times 100$$

$$\Rightarrow 20x = (96000 - x)100$$

$$\Rightarrow 20x = 9600000 - 100x$$

$$20x + 100x = 9600000$$

$$120x = 9600000$$

$$x = \frac{\cancel{9600000}^{80000}}{\cancel{120}}$$

Hence,

$$\boxed{x = 80000}$$ original Price of 1st Scooty

As sold price = 96000

Hence profit earned = 96000 - 80000

$$\boxed{\qquad = 16000}$$

Similarly, we put data of 2nd scooty in eq - A to find its original value.

$$\Rightarrow 20 = \frac{y - 96000}{y} \times 100$$

$$\Rightarrow \quad 20y = (y - 96000)100$$

$$\Rightarrow \quad 20y = 100y - 9600000$$

$$\Rightarrow \quad 9600000 = 100y - 20y$$

$$\Rightarrow \quad 96000 = 80y$$

$$\Rightarrow \quad y = \frac{\overset{120000}{\cancel{9600000}}}{\cancel{80}}$$

Hence,

$$\boxed{y = 1,20,000} \rightarrow \text{Original price of } 2^{nd} \text{ scooty.}$$

This implies

$$\text{loss of } 2^{nd} \text{ scooty} = \overset{\text{Original price}}{\cancel{\text{Sold}}} - \text{sold price}$$

By putting values.

$$\qquad\qquad = 120000 - 96000$$

$$\Rightarrow \boxed{= 24000}$$

Sum of total $\overset{\text{original}}{\text{prices}}$ of two scooty $= x + y$

by putting values

$$\text{Sum} = 80000 + 120000$$

$$\boxed{\text{Sum} = 200000}$$

As sold price is 96000 each. Hence
sum of sold price will be $= 96000 + 96000$

$$\qquad\qquad = 192000$$

As the sold price is 8000 less than
original price. Hence, total loss incurred
by selling scooties is $\boxed{8000}$. **Ans**

Part: 6

Given:

i) 195 men finish a job in 20 Days when they work 10 hours a day.

To Find: How many men will do the same job in 15 days. If they work for 13 hours a day.

Solution:

Men	Days	Hours
195 ↑	20 ↓	10 ↓
x	15 ↓	13 ↓

If we draw a relation between men and day, we'll find there is indirect relation. As when men are less, more days are required to finish the job and vice versa.

Hence, there is indirect relation between men and days.

Similarly, if we compare men and hours, certainly when men are greater they would take less hours to finish the job and vice-versa. As initially hours were 10, hence we need more men but later to hours increase, they less men can finish the job. In other words, There is a indirect relation b/w hours and men in the given data.

Hence, equation will be:

~~x : 15 = 20 : 10~~

$$\frac{x}{195} = \frac{20}{15} \times \frac{10}{13} \quad 13$$

$$x = \frac{20 \times 10 \times 195}{15 \times 13}$$
$$\frac{}{1}$$

$\boxed{x = 200 \text{ men}}$ **Ans**

Hence, we need 200 men to finish the same job in 15 days.

Given =
$$A = \{a, e, i, o, u\}$$

$$U = \{a, b, c \cdots z\}$$

To Find : the value of A'.

Solution :

As A' is known as the compliment of A, which is can be the difference of A and U. In mathematical terms A' will be

$$A' = \quad A - U \rightarrow (i)$$

From the given data, by putting value.

$$A' = \{a, e, i, o, u\} - \{a, b, c \cdots z\}$$

As 'U' has all the elements of set A. Hence the difference of 'A' to 'U' will none but empty set.

$\therefore \quad A' = \{\phi\}$ **Ans**

hence, A' will be an empty set.

Part: d

Given data:

Volume of pyramid square $= 372 \, Cm^3$
Height $= 3km$

To Find: Perimeter of its base.

Solution:

As formula to find the volume of a pyramid square is:

$$Volume = \frac{1}{2} (Base \times Attitude) \rightarrow ii,$$

By taking values of volume and attitude which means height from the given data.

$$\Rightarrow 372 = \frac{1}{2}(\text{Base} \times 3)$$

$$372 = \frac{3}{2}\text{Base}$$

$$372 \times 2 = 3 \cdot \text{Base}$$

$$\frac{744}{3} = \text{Base}$$

$$\boxed{248\,cm^3 = \text{Base}} \quad Ans$$

Hence, the base is $248\,cm^3$

Q: No: 2

Part: d

Three Renewable Energy resources under CPEC.

There are many projects under CPEC but three main which deal with renewable energy are discussed below.

1- Quaid-E-Azam Solar Park using solar energy

First of all it is Quaid-E-Azam solar Park that is developed under CPEC in the city of Nawab ___ Bahwalpur. The government has ensured that this is one of two world largest solar energy production unit. All energy produced under this project will be obtained via using

in right. The unit is located in Punjab under the Allama Iqbal Industrial International city special economic zone.

2- Sukhi kenari and karot Hydal power projects in KPK, AJK and Punjab.

Another resource that is renewable and is being used under CPEC is water. As Pakistan's 1/3rd of water is directly discharged into to Arabian ocean, thereby, the government committed to tap this precious resource. These two power energy production units are in KPK and karot, Punjab or Azad Jamu and Kashir.
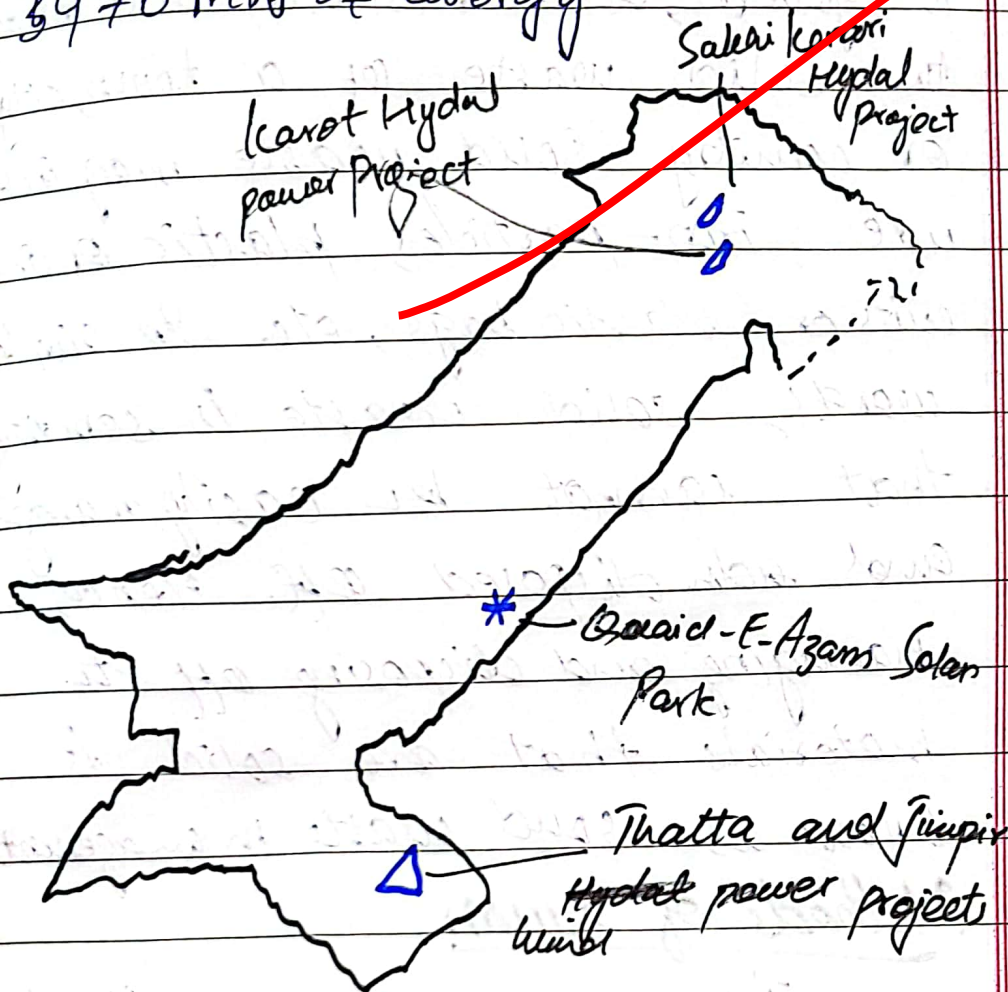
3- Thatta and Jimpir Wind power projects in Sindh

Sindh being a province close to coastal line have different wind patterns while keeping in two wind under CPEC to

government has started work on Thatta, and Jimpir for planting a wind power project. The project is operational and have capacity producing almost 3970 MW of energy.

Karot Hydal power Project

Sakri karori Hydal Project

Quaid-E-Azam Solar Park.

Thatta and Jimpir Hydal power projects

Source: CPEC.gov.pk

Hence, these are the projects which use renewable energy resource in Pakistan under CPEC.

6- Solid Waste Management (SWM)

Solid waste management is a methodology that is used to govern, administrate and manage the solid waste of a town, city or country. Solid waste may include iron-particles, plastic or circuits or plastic bags, etc. In simple words, solid waste is something that cannot be easily managed and disposed off. Hence, managing and disposing off the materials that are solid is known as solid waste management.

Methods of SWM:

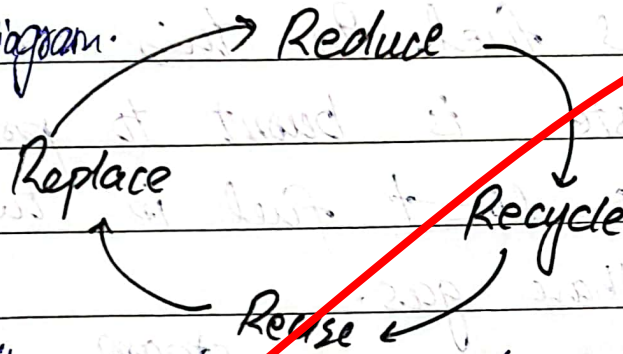There are many methods of solid waste management but the commonly used are given below.

1- Landfills

It is one of the mostly adopted methods of solid waste management: Solid waste is carried away from the cities or towns to

areas which are open. Then, after some day, they are filled in pitches of land. Mostly developing states follow it as it is less costly yet dangerous for health.

2- 4R Method

Another most effective approach used for solid waste is 4R method. The method is elaborated in diagram.

Reduce → Recycle → Reuse → Replace → (cycle diagram)

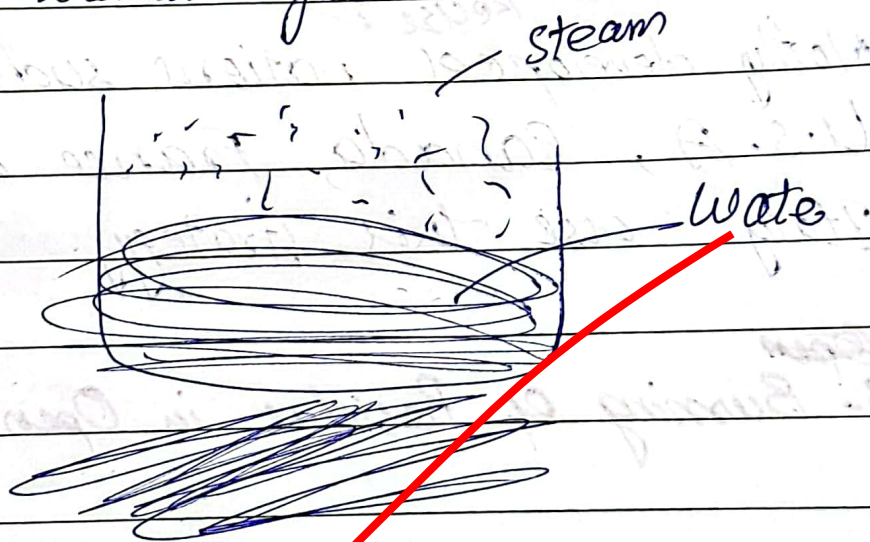Mostly developed nations such as U.S.A, Canada, France and Italy use this strategy.

3- Burning of Residue in Open Air

Another method used for solid waste is open burning of the waste. In this method solid waste is gathered in

in form of piles. Then these piles are openly burnt in the air. The method is very toxic and unhealthy as it triggers respiratory diseases.

4- BioMass fuel production through using Solid waste

Another method is management of solid waste through bio mass fuel. In this method the waste is burnt to produce biogas so it fuel in the form of methane gas.

Hence, it is another method.

Balanced Diet :

Balanced diet is plan in which the amount of nutrients, proteins, carbohydrates, fats, and ~~ever~~ calories, etc are managed and controlled adequately. In other words, a balanced diet is one that does not badly impact one's health. For example, when someone is got too fat, it is often prescribed by doctors to set a balanced diet. For instance, a gymer is often said to take proteins before exercising. Nuts, milkshakes, dry fruits are often suggested to be the part of food.

Fiber is another part of balan-ced diet. In balanced diet

all these are kept in moderate
level so that one can burn or
gain calories easily. I
Like, doctors often recommend to
take chaclates while studying as
it helps to raise one's glucose
level which gets low due to
concentration. Similarly, taking 4 to
5 litre of water daily is also a
part of balanced diet.

a- Key Features of COP-28 regarding

Loss and Damage Fund:-

Like the previous Conference
of Parties ((COP-27), COP-28 also
pledges many commitments and
promises, the major one is the
loss and damage fund which,
is promised in COP-28.
The leaders from developed nations
along with the United Nation authori-

ties have realized that developing nations have confronted a huge damage due to the ongoing calamity of climate change. Recent floods in Pakistan leaving half of the country under water, damaging million ~~rupees~~ dollars worth crops and inflicting infrastructural damage is a glaring proof. R

leaders at COP-28 promised that even though they have failed to collect $100 bn of COP 27, they would try to reach the level of loss and damage fund of COP-28 which is over $250bn.

Apart from that, it is also discussed that developing nations lack finance required for technology transition, thus, they must also be provided with finance so

so that they could cater their technology needs.

The Gulf states also promised that would give a lending hand to the climate suffered nations so that these nations could stand soldier by soldier with the global community.

Along with the loss and damage fund the governments also pledged that adaptation and mitigation funds must be reached to the nation which faces the impacts of climate change.

Lastly, in COP-28, parties also shown a great willingness that in coming future there would be increase in the loss and damage fund.

Hence, these are the key features discussed in COP-28.

Q: NO: 5

Part :- a

RAM	ROM
1- RAM stands For Random Access Memory (RAM).	It is abbreviated form of ~~Read~~ Read Only Memory.
2- It is volatile form of memory. Data used on it is not stored permanently. Untill the data is in run-time, it is some but once run time complete RAM does not keep the data.	It is non volatile memory. It stores the data for longer period. Though only using it, data is later used. As RAM cannot hold data for long time, thus, ROM is important for computers
3- It is often of less size. For example in PC, (personal computers), it is mostly between 1GB	It is commonly of large size. Simply because, it stores the whole data of computers, Thereby,

to 20 GB. It may be larger than that depending upon the requirements of the users.

It is commonly above 100 GB ~~later~~. For it manages the data of users which is in various forms.

Example

For example ~~when~~ we listen to a song, it is played with the help of RAM.

While the song when it is stored is not RAM but ROM. Hence when song stops playing or we may have a power cut, the data will lost from the RAM but ROM still holds it.

Nibble:

Nibble is another computer related terminology. It is one of the terms that are used to describe memory of a computer.

USB:

USB stands for Universal Serial Bus. By 'bus' in computer language means the path of traffic. In computers, to share data from one place to other place, we often use USB. It develops a connection to transfer data from one side to other. Or it can be said it's a form of medium.

Part: b

AI Revolutionizing the World

Artificial intelligence has revolutionized the world in various ways. It has changed the world completely through changing the means of doing things. Major areas where it has brought about a profound change are

discussed below.

1- Revolution in Military Equipments

AI has completely changed the military weapons. From AI based ~~miss~~ drones to guided missiles, everything in military domain is getting changed with the rise of AI.

Example: U.S used AI based drones in many attacks in Afghanistan against Taliban.

2- Medical Field Transformation

Similarly, medical field is also going through AI-backed transformation. Research and development aside, AI is helping medical field through designing Robots that can perform medical operations.

Example:

In U.S, a Robot was used to perform a surgery which proved very helping. Similarly, AI

based softwares are also being used to diagnose diseases.

3- Change in Economics

Economics has throughly changed in the AI world. Today, the world is having e-commerce. Online AI-based algorithms are handling everything. Data analysis of AI are reducing cost of doing business.

Example of Japanese Robot: The robot can work for 22 hours. It can lift upto 400kg weight easily.

4- Revolution in Transportation Industry

Transportation industry is another area which substantiate that AI has revolutionized the world.

Driverless robot-based cars are a glaring evidence of the aforesaid

5- Media Industry and AI.

AI has also changed the media industry by many ways. Recently reporting was done by robots which is a conseque of AI.

Research and Development and Role of AI.

AI is culture & helping in military, medical and transportation, it is also helping in research and development. It is igniting the process of innovation and inventions. There are many instances where its role can be seen.

Agriculture sector is a glaring area where AI-based research has increased the production.

Concluding Remarks:-

In a nutshell, it is pertinent to say that AI has revolutionized the world through transforming the major sectors like agriculture, military, transportation, and medical.

Part: d

Critical Speed of Satellite

Critical speed of satellite is the speed that is required to send a satellite out from the orbit of the planet. It may vary depending upon the payload and distance that a satellite has to travel. For example, u.s based satellite Appollo has a different less speed than the Chandrayan-3,a satellite sent by India on moon.

Geo-stationary and Polar Satellites.

There are many differen ces between geostationary and polar satellites. Main

differences are discussed below.

1- Purpose

Geo stationary satellites are often used to draw picture of earth. So that the weather pattern can be deduced.

Similarly, they are used...

Polar satellite are basically used for short weather pattern but in longer run they are used to make pole-pictures to determine the climatic changes over the time.

2- Speed

Speed of geo-satellite in terms of picture processing is higher.

They are lower in speed in drawing pictures. They take time.
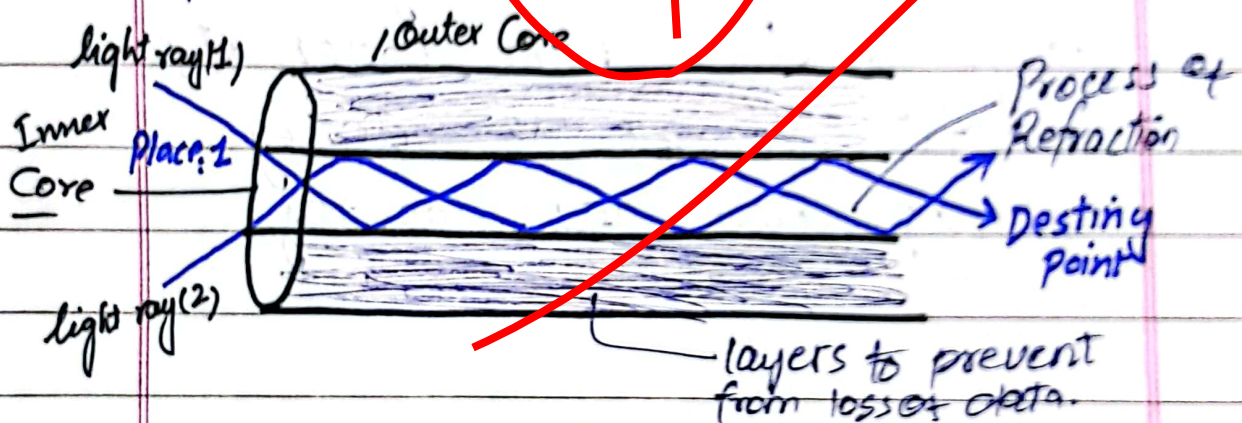
3- Distance

They are closer to earth orbit.

While polar are not close to earth orbit as geo stationary are.

Part : c

Optical Fibre

Optical fibre is a network of glass-like threads which are used to send data from one place to other place through using light signals. The diagram shows how fibre optics networks work.

light ray (1) — Outer Core — Inner Core — Place: 1 — light ray (2) — Process of Refraction — Destiny Point — layers to prevent from loss of data.

From one place, data is entered in the form of light signals and then recieved on the other. It uses the method of refractive index.

Advantages

Time—

1) Efficiency

First of all fibre optics is time saving. It can

transmit data from one place to other without taking hours.

Example: Fibre optic project under CPEC is expected to send data in seconds.

Cost-

2- Effectiveness:

Another benefit of fibre optic is that it is best effective. It is easy to manage. Initially, it takes large amount but later its benefits make it very cheap and less costly.

3- Cost Less Distortion or loss of data

Signals of data are not lost in fibre optics. It is developed fact that fibre optics can cover long distances without losing the data.