

## GSA PAPER

Q2. Distinguish the following terms.

i. RAM and ROM.

a. **RAM:** RAM stands for Random access memory

i. It is a temporary memory storage which is used for the data that the computer is currently using. It holds data for the files and programs which are currently running.

ii. It is a volatile memory. When the power is turned off, data stored in RAM is lost.

iii. It performs both read and write operations.

iv. It provides faster access to data.



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ii ROM:- ROM stands for (Read-

only memory)

i It is a permanent memory storage. It retains data when the computer is switched off. Data

ii. It performs read only functions which means data cannot be modified or erased.

iii. It contains functions and instructions which are required for the boot up process of the system e.g BIOS which initializes hardware

Network:-

It is defined as the interconnection between two or more devices.



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ii It covers a limited area.

e.g. an office. All devices like printers, scanner and computers etc are connected to the office network.

iii Examples of network are LAN (local area network) and WAN (wide area network).

**Internet** :- Internet is the interconnection between various networks across the world.

ii It covers the whole world, all devices connected to the internet can interact with each other.

iii. Example of internet is the world wide web (WWW) which contains websites and webpages.



### i GPS :-

GPS stands for global positioning system. It consists of a network of satellites orbiting around the earth and receivers on the ground. It is used to provide accurate positioning and timing information anywhere on the globe.

### ii GIS :-

GIS stands for geographic information system. It is a system which is used to analyze geospatial data. Its applications include mapping a geographical area and town planning.

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i. **BYTE:-**

Byte is the fundamental unit of digital information.

one byte = 8 bits

whereas a bit represents

a binary digit 0 or 1.

A Byte is used to measure the size of files, or transmission rate. It can represent value from (0-255).

ii. **Nibble:-**

1 Nibble = 4 bits

A nibble is equal to

half a byte. It is

used to represent decimal

value from 0 to 15. or

a hexadecimal digit





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i. Natural satellite:

It is a celestial body which orbits around another larger celestial body. eg Moon is the natural satellite of the earth.

ii. Artificial satellite:-

It is a type of machine which is launched into space and placed in the orbit of the earth or any other planet. examples include Hubble telescope, communication satellites.

Q2b Write a note on optical Fibre.



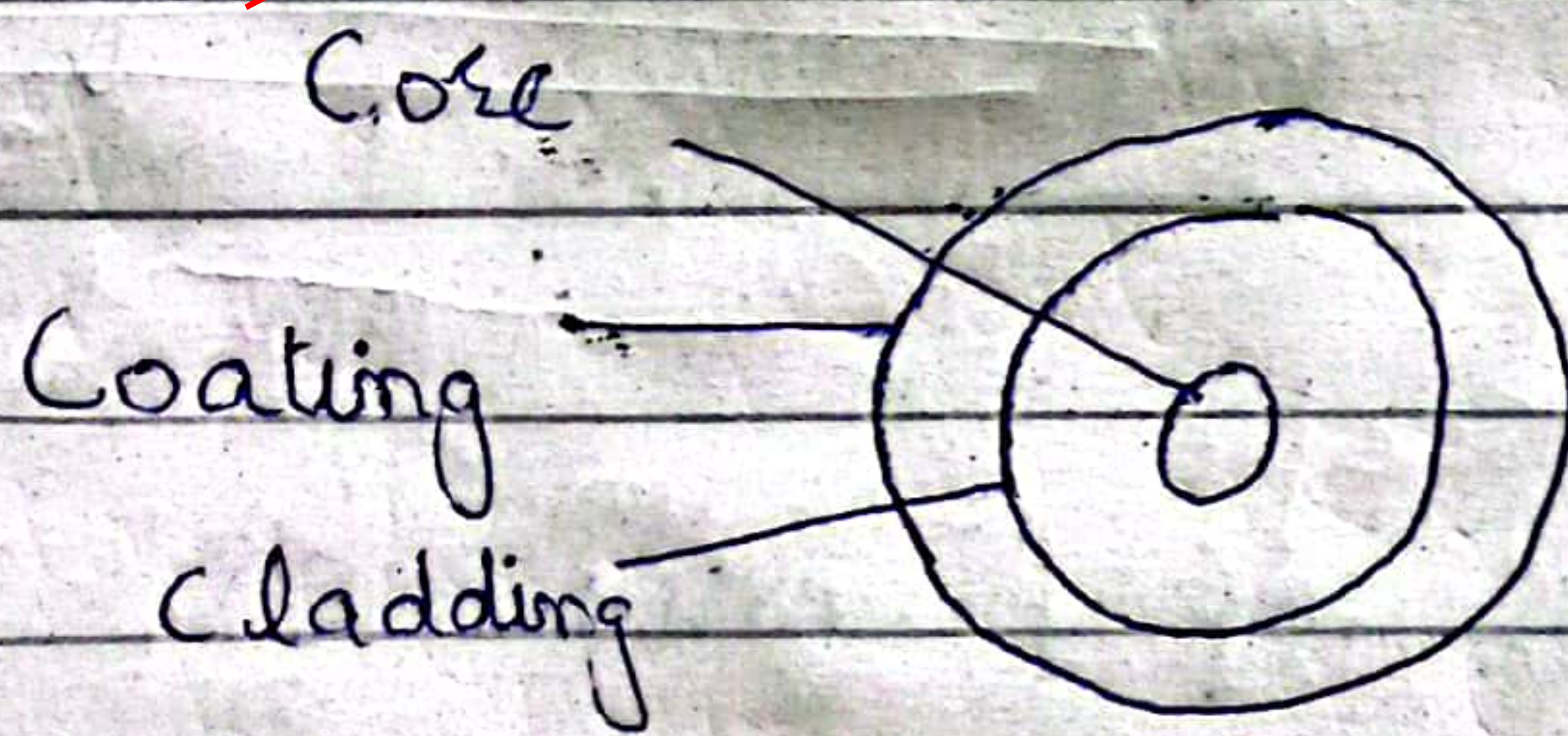
(7)

Fiber optics is a technology of transmitting data, voice and image by a passage of light through a fine thin and transparent fiber over long distances.

### i. Composition of optical fiber

It is made of hair thin plastic or glass.

A typical optical fiber cable contains multiple fibers that are used to carry light signals.



Cross section of optical fiber.

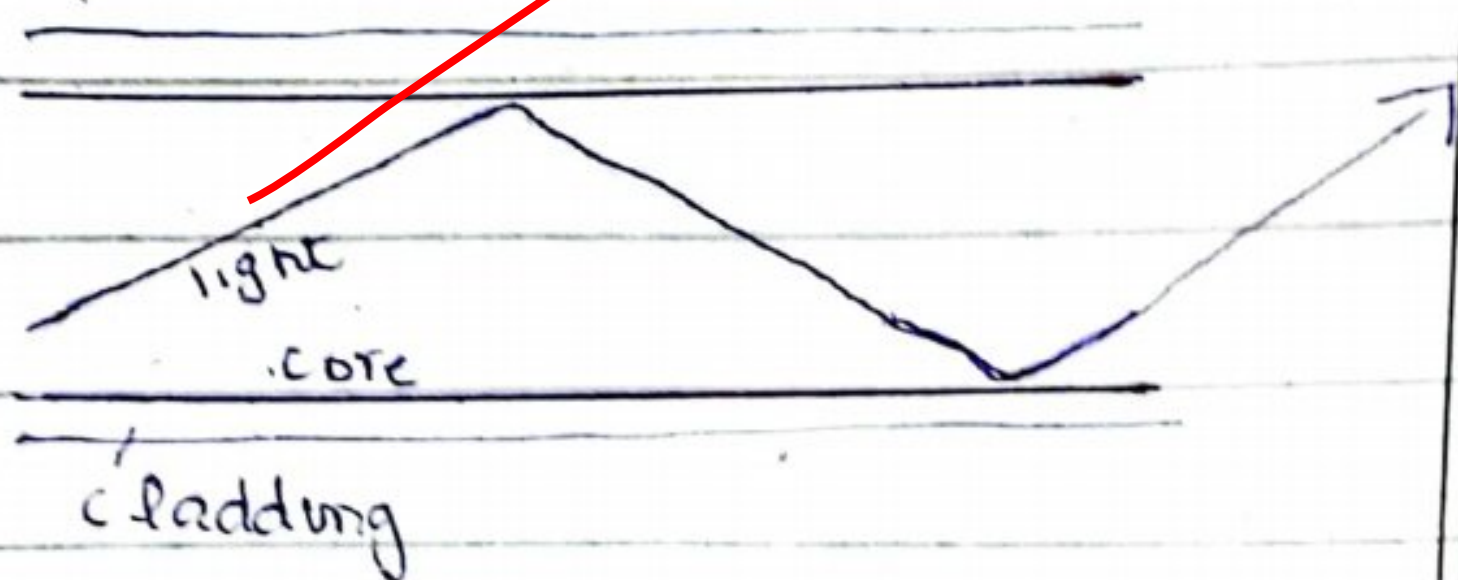
### ii. Transmission:-

Transmission of signals is made possible by the



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Principle of "total internal reflection". Light is transmitted through the optical fiber glass at a certain angle whereby it is totally internally reflected and does not escape the medium.



Total internal Reflection

### iii Types of fibers:-

#### i. Single mode fiber:-

It is used for longer distances. The diameter of its fiber core is smaller. It uses laser as



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light source

ii. Multi mode fiber :-

It is used for shorter distances. diameter of its core is larger which allows signals to bounce and reflect along the way. Its light source is LED.

iv. Advantages :

- i. It can carry greater bandwidth across long distances
- ii. It has greater tensile strength than copper.
- iii. Low power loss compared to copper.
- iv. They are immune to electromagnetic interference



Q28 Water soluble v/s Fat soluble

i. Water soluble :-

Those vitamins which dissolve easily in water and are readily excreted. They cannot be stored in the body. Therefore more consistent intake is important. Water soluble include Vitamin B complex and Vitamin C

ii Fat soluble :-

Those vitamins which can be absorbed in the intestines with the help of fats. They have a tendency to accumulate inside the body which can lead to hypervitaminosis. Fat soluble vitamins include Vitamin A, D, E and K





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## Explain the working of kidney

Kidneys are bean shaped organs located under the ribcage in humans.

### Function:-

- i Kidneys remove waste and excess fluid from ~~the~~ the body.
- ii. They balance the body's fluid by removing toxins, drugs and acids.
- iii Controls production of red blood cells.
- iv Release hormones to regulate blood pressure.
- v Produce active form of Vitamin D to make bones stronger.

### ii. Working:-

- i. Each kidney contains millions of nephrons which are the



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filtering units of the kidney

ii Blood enters the ~~blood kidney~~ through an artery from the heart.

iii. It is filtered by millions of ~~blood filters~~ (nephrons).

iv. Waste material passes through ureter and is stored in the bladder which is later excreted out in the form of urine.

v. Newly cleaned blood returns to the bloodstream through veins



### Q3 How black holes are formed

Black holes are celestial objects with immense gravitational pull which even light cannot escape. They are formed by the death of a star, when the thermonuclear fuel inside the core of a star is exhausted, the core becomes unstable and gravitationally collapses inwards.

The matter which is falling inwards compresses to a point where its volume is zero and its density is  $\infty$  infinite.

Most blackholes are present in elliptical galaxies.

Black hole in our galaxy is present at its center.

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### Q3. Cyclones Formation :-

Cyclones are tropical storms which originate over a warm tropical ocean.

ii Tropical storms or cyclones have two things in common low pressure at the center of the storm and winds that are created by the air flow from high pressure outside to low pressure at the center :-

iii. These winds create a circular motion which moves counter clockwise in the ~~southern~~ Northern hemisphere and clockwise in southern hemisphere.

### Components of a cyclone

iv Inner part is called the eye of the storm. wind speed is lowest here.



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ii Region outside the eye is called eye wall. Wind speed is maximum here.

iii Outermost region is called the ring

~~outer~~ radius = 160 km.

inner radius = 30-50 km

Wind speed increases toward the center.

A cyclone is divided in 5 categories, with ~~category~~ category 5 being the most dangerous.

Cyclone Biparjoy is a category 2 cyclone which is ~~scheduled~~ <sup>predicted</sup> to hit the coast of Karachi or Indian Gujarat.

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Q3c Discuss common causes of floods.

Flood is a type of natural disaster where water overflows its natural banks or onto dry land. e.g. a river stream may overflow its natural banks and engulf the areas surrounding it.

Causes of floods:

i.

Urbanization:

Urbanization usually encroaches upon the natural causeways of water. Such ill-planned construction causes the natural flow to block which causes the water to enter into towns and cities.

ii others include snowmelt, dam failure and cyclones.



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3d How is energy produced inside the sun.

Energy is produced inside the sun's core via fusion reaction. Hydrogen atoms undergo nuclear reaction (fusion) to form helium.

This reaction releases large amounts of energy.

The energy released is in the form of high energy photons.

Gravity of the sun.

Sun's gravity is created by its immense mass.

This gravity attracts other celestial objects into its orbit.

Solar Winds:- These are charged particles (protons and electrons). They travel at



high speeds and affect the other celestial objects in its path.

They interact with magnetic field of earth to cause auroras and geomagnetic storms