

Good for theory portion  
Enough length  
Enough headings  
Perfect diagrams  
Work on math portion

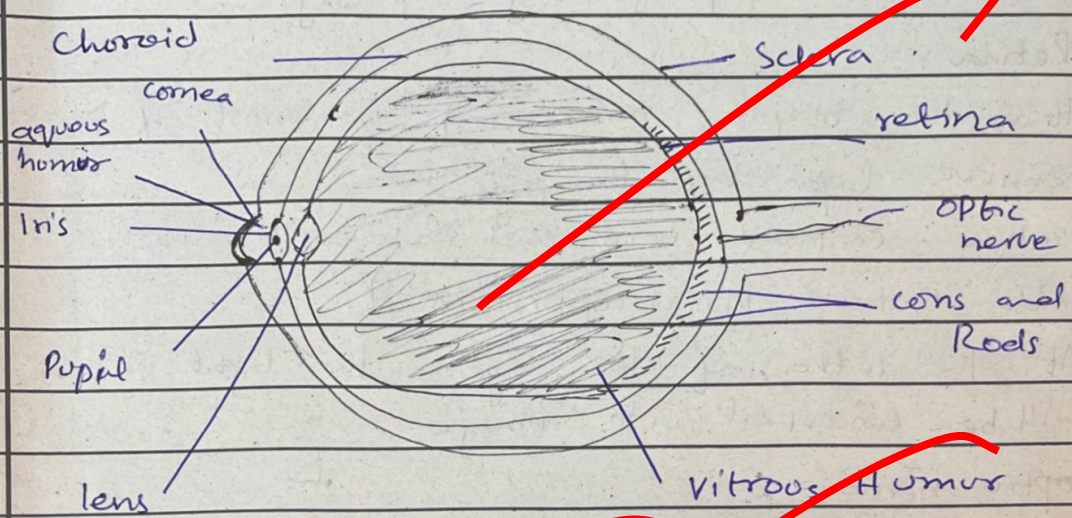
Alfa munir  
Batch - 350

(1)

Part - II  
Section - I

QNo 3 (a)

Discuss different parts of eye. How short sightedness and far-sightedness can be corrected?



Human Eye

- Human eye is a sensory organ, which provides sensory information in the form of visuals / Images.
- It helps us to see.

Parts of human eye

- Cornea
  - It is outer most transparent layer, present at the front of eye.
  - light waves interact with cornea first.
  - cornea is responsible for the bending of light.
- Iris
  - It is a pigment muscle which controls the

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movement of pupil. opening and closure of pupil managed by iris.

• Pupil:

→ It is a small hole from which the light enters in to the eye.

• Lens

→ two responsibilities of lens.

- reception of light.
- responsible for focusing of light waves.

• Retina:

→ It is the major inner most or most of the sensitive layer of the eye.

→ retina contains cones and rods in it which also contains photoreceptors in it.

→ At the retina of the eye the light waves will be converted into image.

• optic nerve:

→ optic nerve pick image from retina and transmit it towards brain and recognized the image.

• Sclera.

→ The Sclera is the outermost layer which is mainly responsible for the protection of the eye.

• Choroid.

→ It is little thicker and reddish layer. the capillaries present in choroid. choroid is mainly responsible for the nourishment of eye.

• aqueous humor:

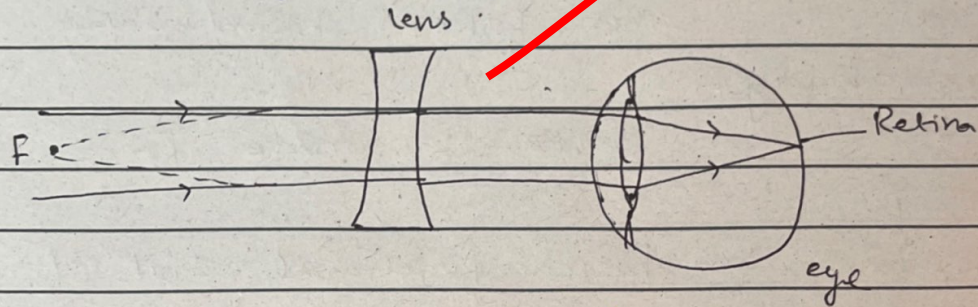
→ It is a fluid filled region or path present

at the frontal side of the eye.

- vitreous humor:
  - It is fluid filled region.
  - It is inside of the eye.
  - It is responsible to maintain fluid balance.

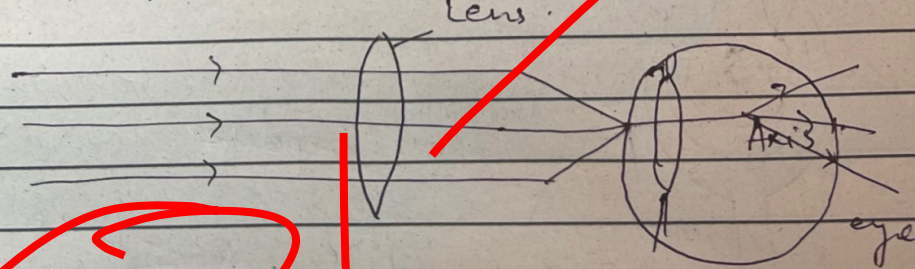
**Short-Sightedness treatment:**

A concave lens is used to correct Short Sightedness (myopia). The concave lens pushes the ray of light further apart so that they arrive together in proper focus at the back of the eye.



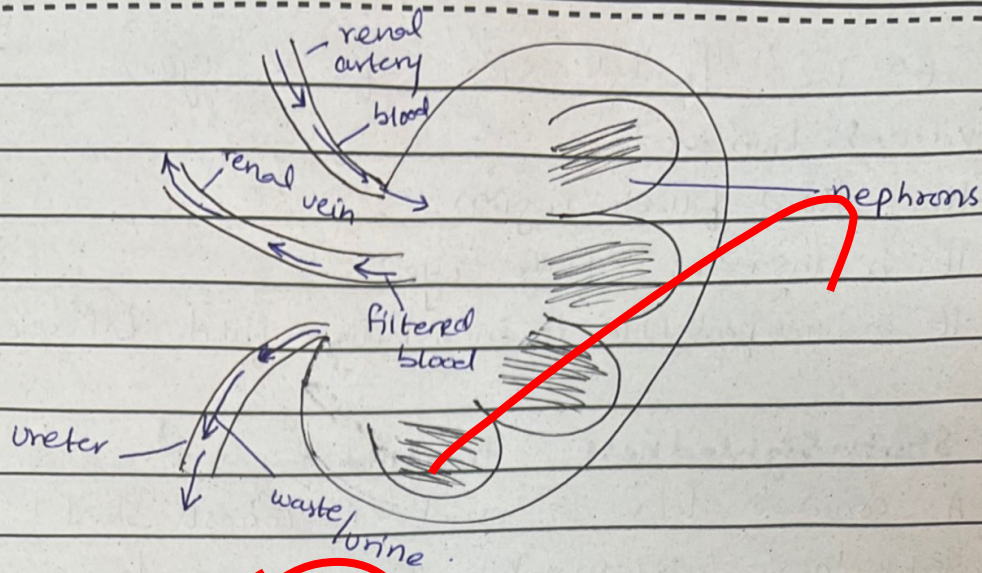
**far-sightedness treatment:**

A convex lens is used to correct far-sightedness. The convex lens bend light rays slightly inwards to give a little bit of additional focusing power to the eye.



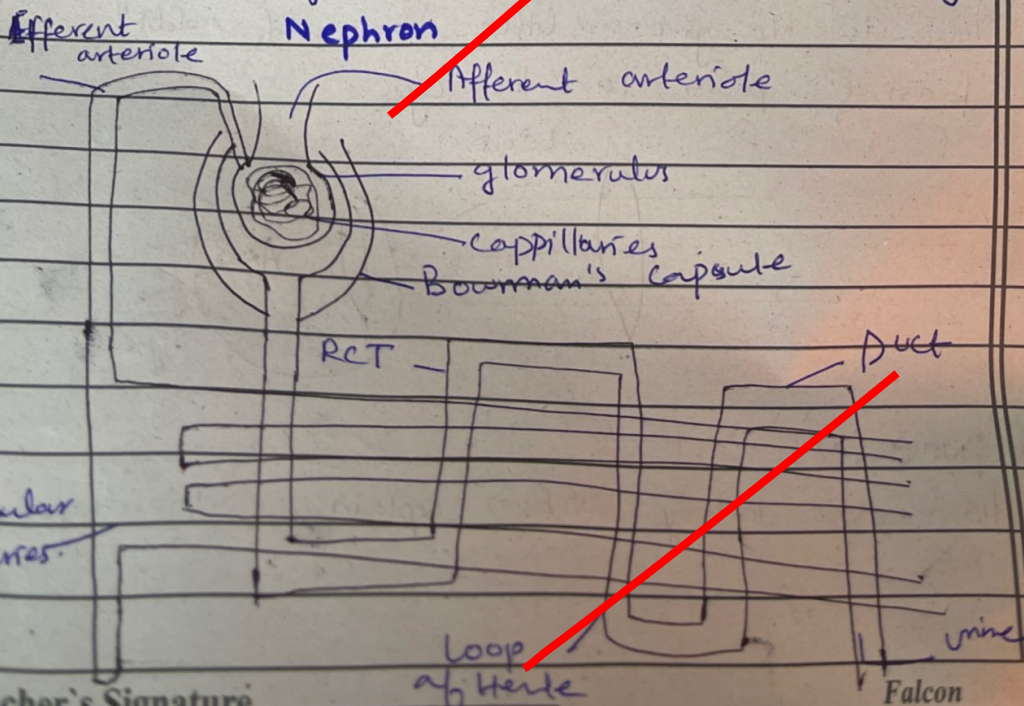
QNO 3 (b)

How does kidney works? Explain with diagram



### Kidney

- renal artery carries blood for filtration towards kidney.
- renal vein carries filtered blood away from kidney.
- ureter carries waste or urine from kidneys.
- Nephrons are basic functional unit of kidneys.
- About 2 million of nephrons are present in both kidneys (1 million in one kidney).



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(5)

Date \_\_\_\_\_

Day \_\_\_\_\_

## Function of Nephron

- afferent arteriole carries blood to nephrons
- afferent arteriole carries blood to glomerulus
- Glomerulus is a cluster of capillaries
- Glomerulus is supported by cup like structure known as Bowman's capsule

- filtrate will move downward through tube like structure which divided into 3 types.

→ Proximal convoluted tubule (PCT)

↓

water reabsorption

→ Loops of henle

↓

Sodium chloride reabsorption

→ Distal convoluted tubule (DCT)

↓

other minerals reabsorption

- filtrate travels from these tubes

↓

waste

- Clean blood present in glomerulus leaves from efferent arteriole
- It is further divided into three structures known as peritubular capillaries. It reabsorbs the water, salt and other minerals from (PCT, loop of henle, DCT)
- Clean blood in peritubular capillaries, goes from kidney through renal artery.
- waste filtrate urine goes out from ureter to urinary bladder and ~~function~~ further removes

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Urethra.

QNO 3 (C)

How black holes are formed?

Black holes.

Black holes are regions in space where an enormous amount of mass is packed into a tiny volume. This creates gravitational pull so strong that not even light can escape. They are created when giant stars collapse, and perhaps by other methods that are still unknown.

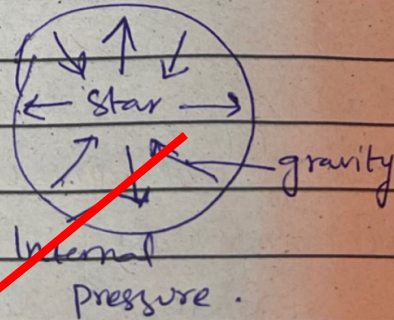
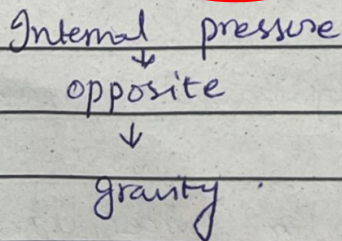
Collapse of star

Due to slow down of fusion reaction internal pressure is decrease. All the matter of stars comes inside and density is increase in less space.

→ All stars have internal pressure

(outwards)

→ gravity of star (inwards)



→ they balance star. when one of them imbalance it results in collapse of star.

### Q No 3 (d)

What are isotopes, isobars and isotones?  
Give examples of isotopes of hydrogen.

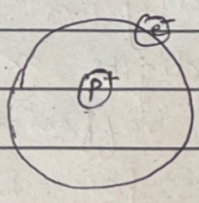
#### 1. Isotopes:

An isotope is a variation of element that possesses the same atomic number but a different mass number. A group of isotopes of any element will always have the same number of protons and electrons. They will differ in the number of neutrons held by their respective nature.

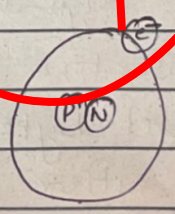
#### 2. Example of hydrogen isotopes

those elements which have same atomic number or different mass number are called isotopes. there are three isotopes of hydrogen:

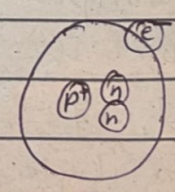
- Protium  ${}^1_1\text{H}$
- Deuterium  ${}^2_1\text{H}$
- Tritium  ${}^3_1\text{H}$



Hydrogen 1  
mass number = 1



Hydrogen 2  
m.n = 2



Hydrogen 3  
m.n = 3

#### 3. Isobars

Isobars are atoms of different chemical elements with equal atomic mass values. Any member of a group of atomic or nuclear species all of which have the same mass number - that is the total number of protons and neutrons.

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#### 4 Isotones

any of two or more species of atoms or nuclei that have the same number of neutrons.

i.e. Chlorine - 37  
Potassium - 39

#### QNO5 (a)

Distinguish between RAM and ROM, also define Nibble and USB.

1

#### RAM

- temporary storage.
- store data in MBs.
- Volatile
- used in normal operations.
- writing data is faster

#### ROM

- Permanent storage
- store data in GBs
- Non-Volatile
- Used for startup process of computer
- writing data is slower.

#### 2 Nibble.

In computing and digital technology, a nibble is four consecutive binary digits or half of an 8-bit byte. When referring to a byte, it is either the first four bits or the last four bits, which is why a nibble is sometimes referred to as a half-byte.

#### 3 USB

Universal Serial Bus (USB) is an industry standard that allows data exchange and delivery of power between many various types of electronics.

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**QNO 5 (b)**

How AI has revolutionized the world? Justify

AI has revolutionized the world in numerous ways.

- **Automation and efficiency:**

AI has transformed various industries by streamlining processes and automating tasks. This has led to increased efficiency and productivity, saving time and resources for businesses.

- **Health care advancement:**

AI is reshaping the healthcare industry through applications such as diagnosis assistance, personalized treatment plans, drug discovery, and robotic surgery.

- **Improved transportation:**

AI technologies are revolutionizing transportation with the development of self-driving cars, traffic optimization systems, and smart logistics.

- **Enhanced financial services:**

AI transformed the financial industry by revolutionizing fraud detection, algorithm trading, credit scoring, and customer service. It provides faster and more accurate service analysis of complex data.

- **Scientific research:**

AI supports scientific research by providing computational power and data analysis capabilities. It aids in tasks like modeling complex systems and scientific simulations.

Over all, AI has revolutionized the world by improving efficiency, personalization and decision making across industries paving the way for a more advanced and connected future.

### Q No 5 (c)

How does an optical fiber work? write some of its advantages.

#### Optical fiber:

It is the study of properties of light and its propagation. This study known as Optics.

#### Definition:

these are the thread like strands of glass which are used to transmit light signal from one point to another point in daily life communication.

#### working of optical fiber:

optical fibers works on the principle of total internal reflection.

when light ray strikes at the internal surface of optical fibre called such that incidence angle is greater than critical angle, then incident light ray reflects in the same medium and this phenomenon repeats.

### Q No 5 (d)

What are critical speed of light?

Satellite? Differentiate geo stationary and Polar satellites.

## critical speed of satellite ::

the critical velocity of the satellite is independent of the mass of the satellite. So, the critical velocity of satellite doesn't change with the change of the mass of the satellite. the critical speed of the satellite is constant for the planet. For Earth the critical speed is  $7.9 \text{ km/h}$ .

## geo stationary satellite

a satellite in which its motion is synchronized with the spin motion of the earth.

→ It moves from west to East. due to clock wise spin of the earth.

## Polar satellite

these are the satellites which moves from the north pole to the south pole

→ less use of polar satellites

→ with the help of rocket.

## Section - II

QNO 6: (a)

Five years ago age of father was thrice the age of son. If son is 30 year old now. what is current age of father

**Solution**

Given age of son = 30 yrs

Let father's age =  $x$

then five years ago father's age  
=  $x - 5$

Son's age = 30  
= 25

father's age was thrice of son's age

$$x - 5 = 3(25)$$

$$x - 5 = 75$$

$$x = 75 + 5$$

$$x = 80$$

Son's age is 30 then father's age would be 80.

QNO 6 (b)

Mean of 10, 30,  $y$ , and 50 is 50  
what is value of  $y$ ?

**Solution**

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

$$\frac{90 + y}{4} = 50$$

4

$$90 + y = 50 \times 4$$

$$90 + y = 200$$

$$y = 200 - 90 = \boxed{110}$$

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Q No 6 (c)

Find missing terms.

①

2, 6, 18, 54, \_\_\_\_\_

②

3125, 256, \_\_\_\_\_, 4, 1

Solution::

- ① In the geometric sequence 2, 6, 18, 54 the ratio is always 3. This is called Common ratio.

2, 6, 18, 54, 162

- ② In the given series numbers are arranged following the rule  $5^4, 4^4, 3^3, 2^2, 1^1$

therefore the missing number is

3125, 256, 27, 4, 1

Q No 6 (d)

If the product of two numbers is 320 and their ratio is 1:5 what is the difference b/w the squares of these two numbers.

Solution.

the product of two number = 320

Ratio of number = 1:5

let one number is  $x$ and another is  $5x$ .

$$\Rightarrow x \times 5x = 320$$

$$= 5x^2 = 320$$

$$k^2 = \frac{320}{5}$$

$$k^2 = 64$$

$$\sqrt{k^2} = \sqrt{64}$$

$$k = 8$$

$$5k = 40$$

Sum of the two numbers

$$8 + 40 = 48$$

Sum of two numbers is 48.

Q No 8 (a)

Solution

the crow is 2.63 km away  
from starting point.

(b)

1 probability for shiza  
to pick raisins slice.

(c)

12 triangles.

