

If you have written it in 3 hours then excellent  
Perfect answers  
Enough headings  
Enough length  
Fine diagrams  
Complete steps in math portion

SECTION - II

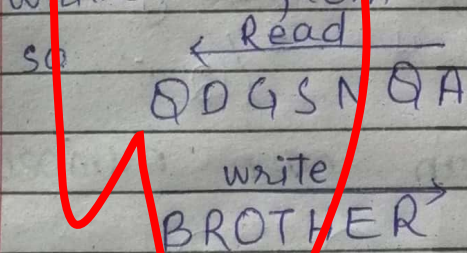
QNO8 :

(a) BROTHER — QDGSNQA  
SISTER — QDSRHR

Explanation :-

The word written above i.e BROTHER is coded as QDGSNQA.

It shows that QDGSNQA is read from right to left and the alphabet came after every alphabet of QDGSNQA is written from left to right.



A → B, Q → R, N → O, S → T,  
G → H, D → E, R → R.

Same is with

SISTER

S ← R	I ← H	S ← R
T ← S	E ← D	R ← Q

Written from right to left  
Q D S R H R for sister

(b) Given Data :-

Total cards = 12

Numbers written on them =  
1, 2, 3, ..., 12.

To find :-

Sol:

(i) probability of 8.

By using formula :

Probability of Event =  $\frac{\text{Favourable event}}{\text{Sample space}}$

$$\text{Probability of 8} = \frac{1}{12}$$

So, probability of drawing 8 from card is  $\frac{1}{12}$ .

(ii) Probability of an even number:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

There are total 6 even numbers.

$$\text{Probability of even no.} = \frac{6}{12}$$

$$\text{Probability of drawing even number} = \frac{1}{2}$$

(iii) A perfect square :

From number 1 to 12, there are 3 perfect squares i.e. 1, 4, 9  
So,

$$\text{Probability of perfect square} = \frac{3}{12}$$

$$\text{Probability of perfect square} = \frac{1}{4}$$

(iv) A negative number.

There is no negative number from 1 to 12, so probability of drawing negative number is "zero".

$$= \frac{0}{12}$$

$$\text{Minimum probability} = \frac{\text{Zero}}{12}$$

(v) A number less than 13.

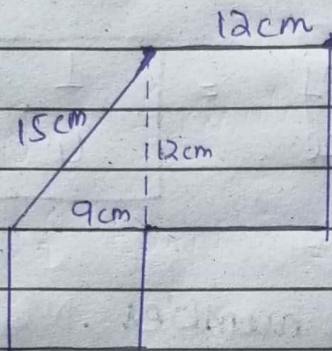
Number 1 to 12, all are less than 13. So, there are 12 numbers.

$$\text{Probability of no less than 13} = \frac{12}{12}$$

Probability of  $\boxed{4}$   
no. less than 13

Maximum probability

(c)



Solution:

There are 3 figures:

- 1 small square
- 1 triangle
- 1 large square.

(i) Area = Area of small square + Area of large square + Area of triangle:

Triangle:

It is right-angled triangle,  
so by Pythagoras Theorem;

$$c^2 = a^2 + b^2$$

$$15^2 = 12^2 + b^2$$

$$225 = 144 + b^2$$

$$b^2 = 225 - 144$$

$$\sqrt{b^2} = \sqrt{81}$$

$$b = \pm 9$$

Length can never be -ive so 9.

$$\textcircled{i} \quad \text{Area of triangle} = \frac{1}{2} \text{ base} \times \text{height}$$

$$= \frac{1}{2} (9) (12)$$

$$\text{Area of triangle} = 54 \text{ cm}^2 \rightarrow \textcircled{i}$$

$$\textcircled{ii} \quad \text{Area of small square} = x^2$$

$$x = 9 \text{ cm}$$

$$= 9^2$$

$$\text{Area of small square} = 81 \text{ cm}^2 \rightarrow \textcircled{ii}$$

$$\textcircled{iii} \quad \text{Area of large square} = x^2$$

$$x = 12 \text{ cm}$$

$$= (12 \text{ cm})^2$$

$$\text{Area of large square} = 144 \text{ cm}^2 \rightarrow \textcircled{iii}$$

$$\text{Total area} = \textcircled{i} + \textcircled{ii} + \textcircled{iii}$$

$$= 54 \text{ cm}^2 + 81 \text{ cm}^2 + 144 \text{ cm}^2$$

$$\text{Total area} = 279 \text{ cm}^2$$

## (ii) Perimeter :

Perimeter is the total length of the boundary lines of the shape.

So, (large square)  
 Perimeter =  $12\text{cm} + 12\text{cm} + 12\text{cm} + 15\text{cm}$  (triangle) +  $9\text{cm} + 9\text{cm} + 9\text{cm}$  (small square)

$$\text{Perimeter} = 76\text{cm}$$

## (d) Given Data :-

Total student = 9

15, 15, 16, 16, 16, 17, 18, 19

To find :

Mean = ?

Median = ?

Mode = ?

Range = ?

Solution :

(i) Mean :

Def : In a data set, the average value is known as mean.

It is found by adding all numbers together and then dividing the sum by number



### (iii) Mode :

Def: In a data set, the most frequent value is known as mode.

#### Calculation :

15, 15, 16, 16, 16, 17, 17, 18, 19.

15 occurs 2 times

16 occurs 3 times

17 occurs 2 times

18 & 19 occur 1 time each.

So, most frequent value is

16

$$\text{Mode} = 16$$

### (iv) Range :

Def: In a data set, the difference between <sup>the</sup> highest and the smallest number is known as range.

#### Calculation :

Data set = 15, 15, 16, 16, 16, 17, 17, 18, 19.

Highest value = 19

Smallest value = 15

$$\begin{aligned} \text{Range} &= \text{Highest value} - \text{smallest value} \\ &= 19 - 15 \\ &= 4 \end{aligned}$$

$$\text{Range} = 4$$



QNO7:

(a) Given Data :-

Total seats = 400

Occupied seats = 325

To find :-

%age of attendance = ?

Solution:

By using formula:

% attendance at a % of capacity

$$\frac{\text{Occupied seats} \times 100}{\text{Total seats}}$$

$$= \frac{325 \times 100}{400}$$

$$= \boxed{81.25\%}$$

Result:

So, the attendance at a percent of capacity is 81.25%.

(b) Given Data :-

Persons = 30, sugar = 40 kg used days = 10.

Persons = 80, sugar = 320 kg used days = ?

Solution: Let the no. of unknown days =  $x$ .  
For this we use the formula of inverse proportion.

Persons	Sugar used (kg)	Days
30	40	10
80	320	$x$

So,

$$\frac{x}{10} = \frac{320 \times 30}{40 \times 80}$$

$$x = \frac{3 \times 3 \times 10}{4 \times 8}$$

$$x = 30$$

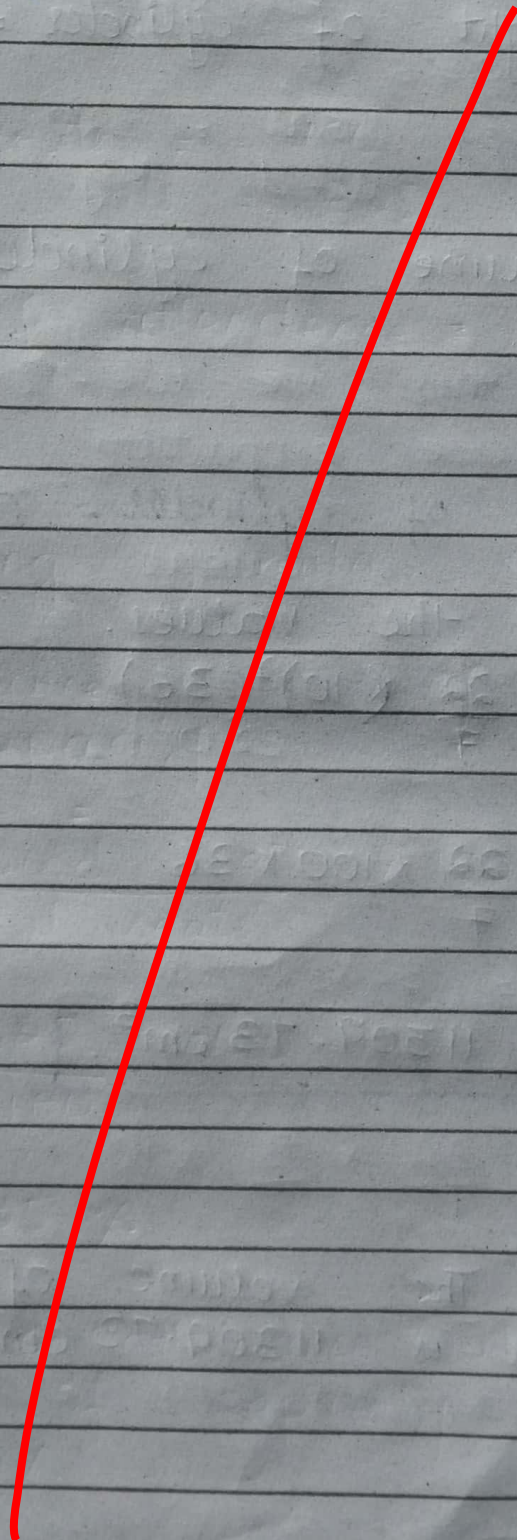
No. of days = 30.

Result:

So, 320 kg sugar is enough for 80 persons usage for 30 days.

(c)

Sketch from data :-



(d) Given Data :-

Radius of cylinder = 10 cm

Height of cylinder = 36 cm

To find :-

Volume of cylinder = ?

Solution:

Volume of cylinder =  $\pi r^2 h$ .

Putting the values.

$$V = \frac{22}{7} \times (10)^2 \times (36)$$

$$= \frac{22}{7} \times 100 \times 36$$

$$V = 11309.73 \text{ cm}^3$$

Result:

The volume of the cylinder is  $11309.73 \text{ cm}^3$ .

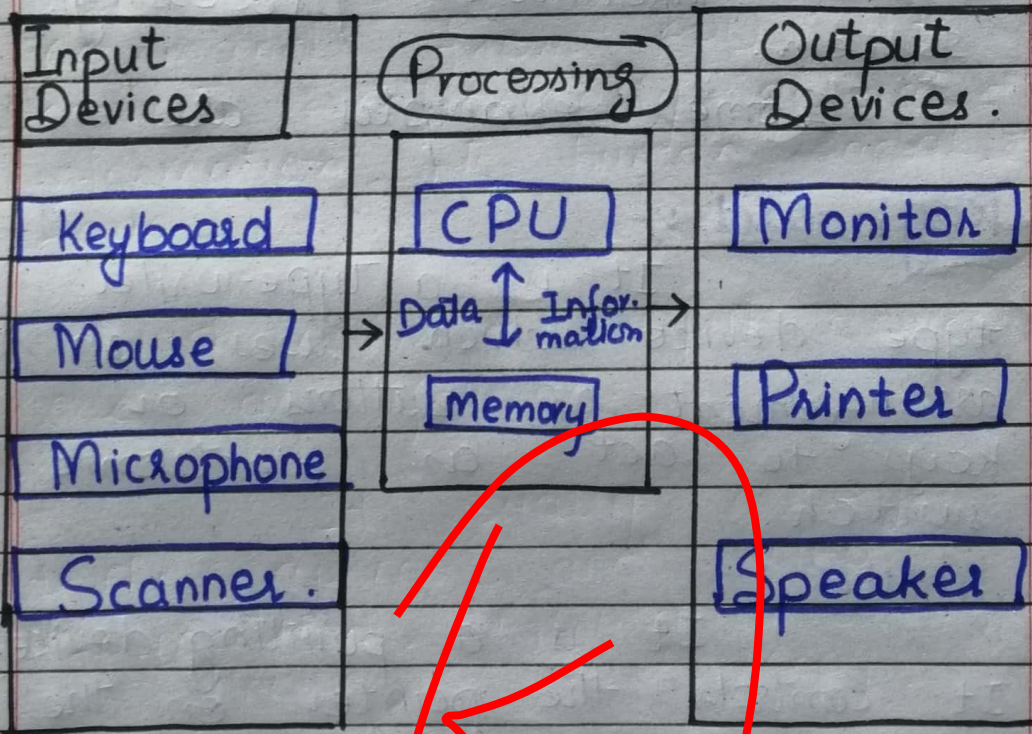
# PART - II

## SECTION - I

Q NO5:

a-

BLOCK DIAGRAM OF INPUT AND OUTPUT DEVICES OF COMPUTER



## Computer :-

It is an electronic device for processing and storing data according to instructions given to it in variable program.

### (a) Input Devices :-

In computer, input device is a piece of computer hardware equipment used to provide data and control signals to an information processing system.

Some examples are

#### • Keyboard :-

It is a type-writer type device which uses an arrangement of buttons or keys to act as electronic switch.

#### • Mouse :-

It is a pointing device. It controls the pointer on the screen. The user gives instructions to the computer through mouse.

#### • Microphone :-

It is used to enter voice into the computer. A microphone is a transducer

that converts sound into electrical signal.

- **Scanner :-**

It is a device that optically scans images, printed text, handwriting and converts it into digital image.

(b) **Output Devices :**

Output device is a piece of computer hardware equipment that uses received data & commands from CPU. It converts electronically generated information into human readable form.

Most common output devices are as follows:

- **Monitor :-**

It visually conveys text, graphics and video information. Information displayed is known as soft copy.

- **Printer :-**

It is a peripheral device which makes persistent human-readable representation of graphics or text on paper.

- **Speaker:** It is used to hear sound, music and voice output.

(c) **Processing :-** It is a process in which raw data is converted into useful information.

**Fundamental Parts:**

- CPU (Central Processing Unit)
- ROM
- RAM
- Data Buses



(b)

## Optics :

Def: "The branch of science that deals with study of properties of light and its effect and its propagation is known as optics."

## Optical Fibres :-

In telecommunication, the strands of glass that are used to transmit light signals from one point to another are known as optical fibres.

## Parts of Optical Fibres :

There are two main parts of optical fibres

(i)

Core :

It is the central part having high density and high refractive index.

(ii)

Cladding :

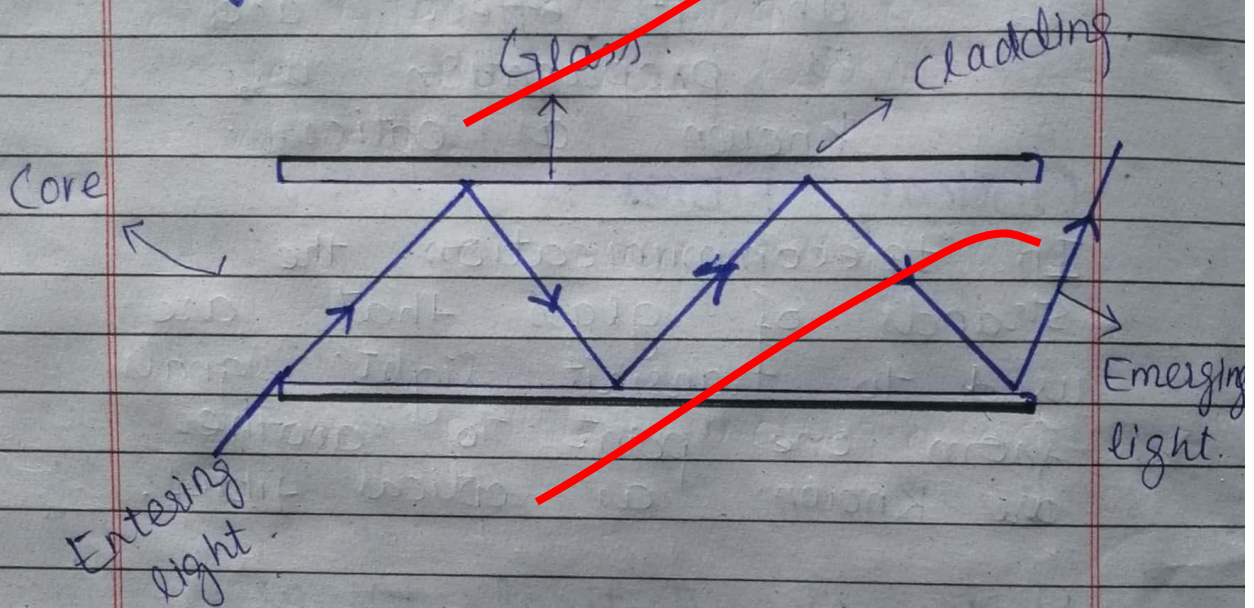
It surrounds the core and have low density and low refractive index.

## Working of Optical Fibers

### Principle:

Total Internal Reflection

### Diagram:



Light travels down a fiber-optic cable by bouncing repeatedly off the walls.

When light is hitting the glass at an angle greater than critical angle, total internal reflection occurs.

Total internal reflection occurs at core-cladding boundary.

The other thing that keeps the light inside cable is structure of cable that is made up of core & cladding.

(c)

## ♣ Solid Waste Management ♣

“The process of supervised handling of solid waste from its generation points i.e. collection through the recovery process upto the disposal is known as solid waste management.”

### Stages of SWM System :-

It has three stages:

- (i) Collection Stage
- (ii) Recovery Process
- (iii) Disposal

## ♣ Methods of Solid Waste Management ♣

(i) Open dumping :-

It is the open deposition of waste in the surrounding of city.

↳ The dumping sites must be away from city & population.

↳ This method is unsafe and unsustainable so must be avoided.

**(ii) Landfill :**

The municipal solid waste is disposed off by dumping off in a landfill. The landfill is digging a large hole in the ground and after dumping off the waste, the hole should be enveloped.

**Advantage:**

It is an easy and safe method.

**Disadvantage**

It can pollute underground water.

**(iii) Composting :**

The controlled, biological decomposition of organic waste is known as composting.

**Conditions:**

Optimized conditions + biological microorganism

←—————→

Waste

↓

Decomposition

↓

Compost (fertilizer)

↳ It is more favourable technique.

(iv) Incineration:

The process of burning of waste at high temperature varying  $900^{\circ}\text{C}$  -  $10,000^{\circ}\text{C}$ .

It is mostly used for hazardous waste like waste in hospitals.

Advantages:

- Reduce the bulk volume.
- The heat of combustion may be used to run turbine to produce electricity.

(v) Recycling of Waste:

The materials like paper, plastic, aluminium etc should be recycled as it saves sources and energy and are inexpensive to the consumers.

Steps:

- (i) Reprocessing
- (ii) Depolymerization
- (iii) Transformation

Advantages:

- (i) It reduces pollutants.
- (ii) It saves resources and money.

(d) Distinguish GPS and GIS:

GPS and GIS are distinguished on the following bases:

(i) Definition and Key uses:

GPS:

Global Positioning System (GPS) is a satellite based navigation system that enables users to determine their location by receiving signals from satellites in space.

GIS:

Geographic Information System and is used for mapping and geospatial analysis of data. It takes data about earth's surface and process it into information.

(ii) Working :-

GPS :-

It works by locating nearby satellites that sends signals to our devices. Then they use position of these satellites to calculate our location on earth.

## GIS :-

It is an important tool used by civil engineers as well as scientists who study volcanoes and earthquakes.

### (iii) Uses :-

#### GPS:

It is used to determine location, time, speed, elevation etc.

#### GIS:

It uses maps and coordinates to study the world.

### (iv) Tool :

#### GPS:

GPS is a measuring equipment

#### GIS:

GIS is a science that uses GPS for spatial analysis.

### Conclusion:

GPS receiver is most popular form of navigation due to its consistent and easy to understand accuracy while GIS is used for geographical information.

Q NO 2 :

(b) Distinguish between water-soluble and fat-soluble vitamins:

These can be distinguished on following bases:

(i) Definition:

Water Soluble:

These are the vitamins only soluble in water.

Fat - Soluble:

These are the vitamins only soluble in fats.

(ii) Storage:

Water Soluble

These vitamins cannot be stored in the body.

Fat Soluble:

These vitamins can be stored in body.

(iii) Consumption:

Water Soluble:

Foods that contain these vitamins should be eaten daily to replenish



body consumption needs  
**Fat-Soluble:**

These are stored in liver and kidneys in excess amounts so do not need to be consumed everyday

(iv) **Examples:**

**Water Soluble:**

Vitamin B and C. Vitamin B includes eight vitamins - B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>5</sub>, B<sub>6</sub>, B<sub>7</sub>, B<sub>9</sub>, B<sub>12</sub>,

**Fat Soluble:**

These include vitamin A, D, E and K.

Diets containing different vitamins

**Vitamin A:**

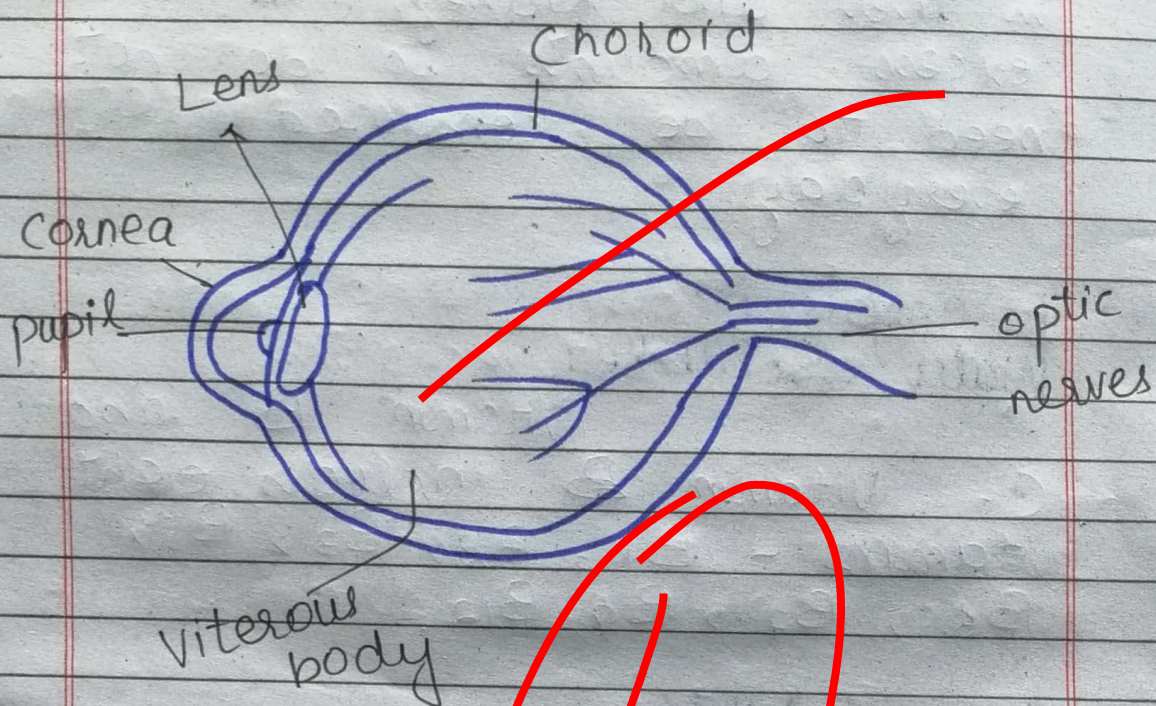
Yellow and orange coloured food, milk, fish.

**Vitamin D:**

Milk, mushrooms, cereals, sunshine.

**Vitamin E:**

dry fruit, vegetables, milk.

(c) Structure of EyeEye:

It is a sensory organ that provides sensory information in the form of visuals or images.

Main Components:

- ① Cornea  
Light waves interact with it first
- ② Iris  
pigmented muscle that control movement
- ③ Pupil  
point at which light enters into eye.

#### ④ Lens

reception of light waves.

#### ⑤ Sclera

It is a layer for protection of eye.

#### ⑥ Retina

It has cones and rods that are photoreceptors.

#### ⑦ Optic Nerve

It picks the image from retina towards brain.

#### ⑧ Aqueous humour

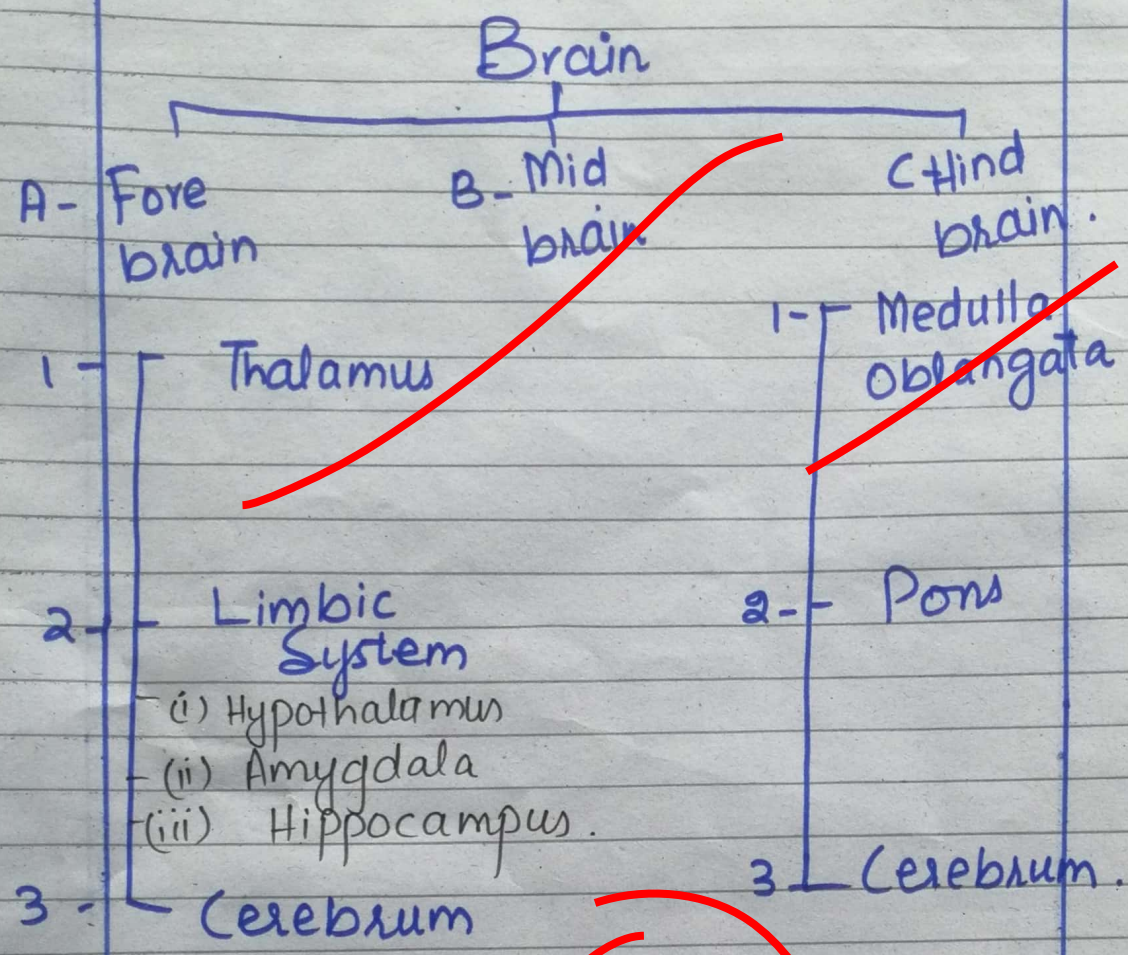
- ↳ It is a fluid filled part.
- ↳ It provides nutrients and gases.

#### ⑨ Vitreous humour

- ↳ It is inside the eye and supply nutrients.

next

(d) Flowchart of Parts of Brain



Brain :-

It is a complex organ responsible for body management. It is the control system of body.

It is protected by cranium which is a hard bone and has fluid filled part called meninges.