

General Instructions

- Section - B
1. Give numbering to headings
 2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings
 3. Do not use table for comparison and contrast questions.

4. Draw figures/diagram/flowchart where needed.

5. Start new question from fresh page.

6. Write unit of the answer in ability section.

7. Explain mathematical steps and the reasoning for better score.

8. Change colour scheme for references to give them more visibility.

9. Manage time well.

10. Wide page borders are discouraged. Should be reasonable.

11. Avoid writing wrong references.

12. Give more weightage to expressly asked part/s of the question.

(a)

A car (first half) = 40 km/h

(second half) = 60 km/h

average = ?

Solution:

Formula for Average =

$\frac{a+b}{2}$ or $\frac{\text{sum of numbers}}{\text{total number}}$

Average = $\frac{\text{first half speed} + \text{second half speed}}{2}$

= $\frac{40 \text{ km/h} + 60 \text{ km/h}}{2}$

$$= \frac{100 \text{ km/h}}{2}$$

$$= 50 \text{ km/h}$$

Average = 50 km/h

Answer

(b)

Data:

ROSE is coded 6821

CHAIR is coded 73456

PREACH is coded 961473

SEARCH?

Solution:

In this question this code the alphabates are coded as follow.

| | | | |
|---|---|---|---|
| R | O | S | E |
| 6 | 8 | 2 | 1 |

$R=6$, $S=2$, $E=1$

| | | | | |
|---|---|---|---|---|
| C | H | A | I | R |
| 7 | 3 | 4 | 5 | 6 |

$C=7$, $H=3$, $A=4$, $R=6$

| | | | | | |
|---|---|---|---|---|---|
| P | R | E | A | C | H |
| 9 | 6 | 1 | 4 | 7 | 3 |

$R=6$, $E=1$, $A=4$, $C=7$, $H=3$

| | | | | | |
|---|---|---|---|---|---|
| S | E | A | R | C | H |
| 2 | 1 | 4 | 6 | 7 | 3 |

Therefore, SEARCH is coded a 214673

Ans

(C)

Data:

A is the Brother of B.

B is the Sister of C.

C is the father of D

D related to A? (D is male)

Solution

In this case A is the brother of B and B is the sister of C. Therefore A and C are brothers.

C is the father of D and D is male member. Therefore, D is the nephew of A.

D is the nephew of A.

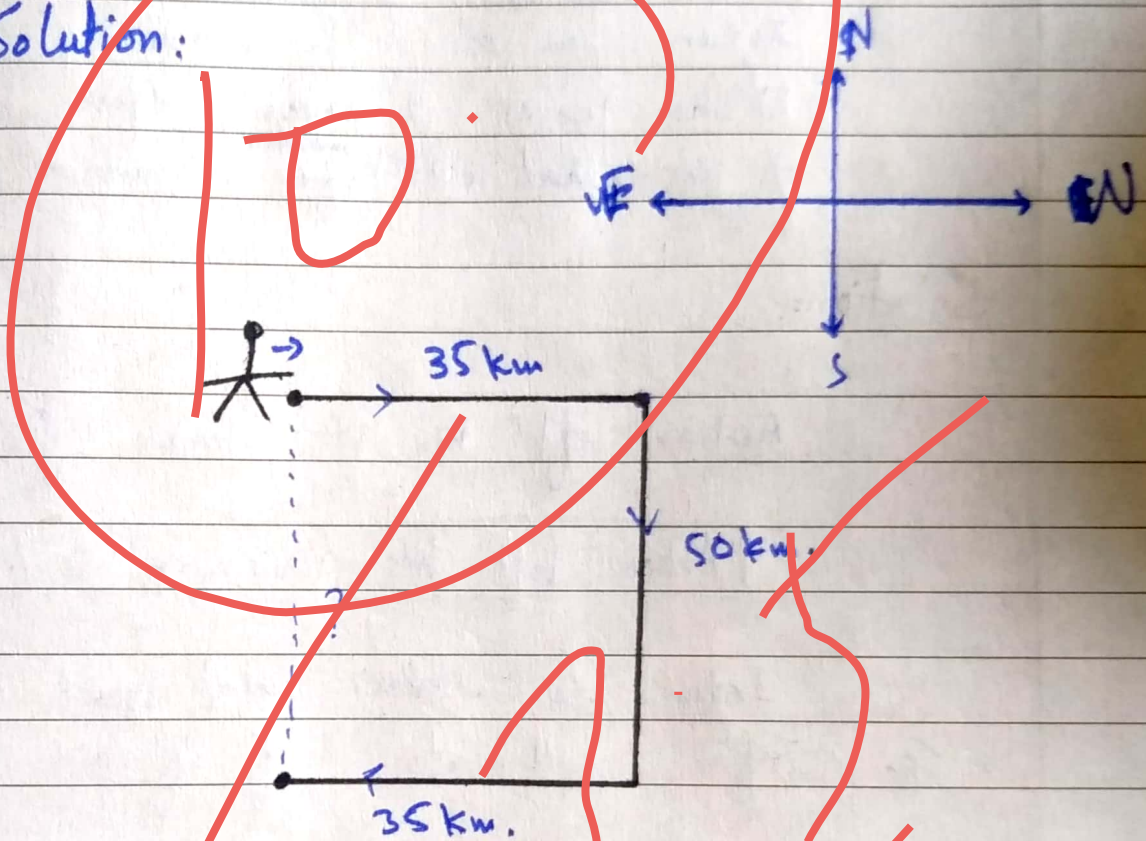
Ans

(d)

Data:

Kashmala travels 35 km towards west
After turn right = 50 km
Another right turn = 35 km
Original position from start point?

Solution:



After her graphical representation of her travels the shape look like rectangle. In rectangle opposite sides are equal. Therefore Kashmala is 50 km away from original point.

Kashmala 50 km away from her original point.

Am

Q NO 7:

(a) Data:

Ishaq can do a job in 6 hours

Abbas required = 4 hours.

Irfan can do in 8 hours

Abbas leaves 2 hours before his completion of job. what will ^{time} Irfan required?

Solution:

Abbas left his job's work = $\frac{2}{4} \times 100\%$

Abbas left his job's work 50%.

~~Irfan do Abbas's total work in 8 hours
So, Irfan will do half of his work in 4 hours~~

Irfan would complete work = 4 hours (Abbas' work)
+ 8 hours (his own job).

Irfan would complete work = 12 hours.

Ans.

(6)

Data:

Area of farm = 576 m^2

Area of wall = ? (If 2 meters high on 3 sides and 3 meters high on one side)

Solution.

$$\text{Area} = a \times a$$

$$\therefore \text{Area of farm} = 576 \text{ m}^2$$

$$576 = a^2$$

$$\Rightarrow a^2 = \frac{576 \text{ m}^2}{1}$$

Take square root on both sides

$$\sqrt{a^2} = \sqrt{576 \text{ m}^2}$$

$$a = 24 \text{ m}$$

$$\begin{aligned} \text{Area of wall in 3 sides} &= 3(L \times b) \\ &= 3 \times 24 \times 2 \\ &= 6 \times 24 = 144 \text{ m}^2 \end{aligned}$$

$$\text{Area of wall in 3 sides} = 144 \text{ m}^2$$

$$\begin{aligned} \text{Area of wall in one side} &= 1(24 \times 3) \\ &= 1 \times 24 \times 3 \end{aligned}$$

$$\text{Area of wall in one side} = 72 \text{ m}^2$$

Area of wall in 3 sides with 2 meters high is 144 m^2 and in 1 side with 3 meter high is 72 m^2

Amey

(a) Data

7 students having ages = 18, 18, 19, 19, 21, 21

mean = ?

median = ?

mode = ?

range = ?

Solution:

(Definitions of terms)

Mean:- The ratio of sum of number of a given set of values to the total number of values present in the set

$$\text{Mean (Average)} = \frac{\text{Sum of Numbers}}{\text{Number of Units}}$$

Median: It is defined as the middle value of a sorted list of numbers. But number must be in ascending order. If dataset is even, it is necessary to find the mean of the middle two numbers.

e.g

Odd: 1, 3, 4, 5, 6 (4 is the median).

Even: 1, 3, 4, 5, 6, 7

↳ Average of 4, 5 is median.

Mode: The value occurring most frequently in a set.

e.g

1, 2, 2, 3, 3, 3, 4 (3 is the mode)

Range: It is the difference between the lowest and highest values.

e.g. $\{1, 2, 3, 4, 5\}$

$$R = 5 - 1 = 4.$$

$$\boxed{\text{Range} = 4}$$

Solution Of Given Data:

$$\text{Mean} = \frac{18 + 18 + 19 + 19 + 19 + 21 + 21}{7}$$

$$\boxed{\text{Mean} = \frac{135}{7} \text{ or } 19.3}$$

$$\boxed{\text{Median} = 19}$$

(Because set database is odd and in ascending order so, middle term is median).

$$\boxed{\text{Mode} = 19}$$

(Most occurring)

$$\text{Range} = \text{highest} - \text{lowest}$$

$$= 21 - 18$$

$$\boxed{\text{Range} = 3}$$

$$\boxed{\text{Mean} = 19.3, \text{ Median } 19, \text{ Mode} = 19, \text{ Range} = 3}$$

Ans.

(d) What is Mental Ability?

It is behavioural interplay and our abilities related to memory, analytical capabilities, concentration and intelligence facilities by our brain.

What is IQ Test?

It is an assessment which measures a range of abilities of a person.

How they differ with each other?

Despite this both are related to human intelligence but mental ability and IQ test are different with each other. Mental ability is not a scale it is abilities of a person and IQ test is a scale which measures the ability what person can do.

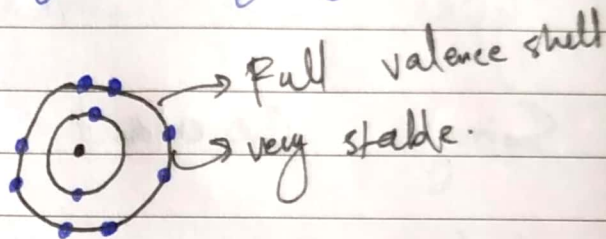
Section - A.

Q_{NO2}

(a)

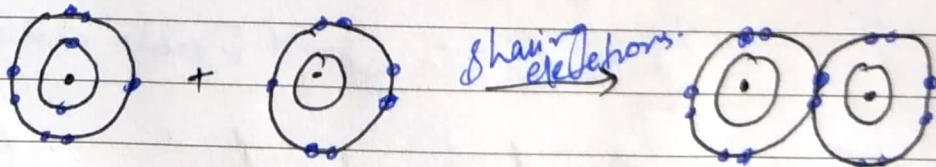
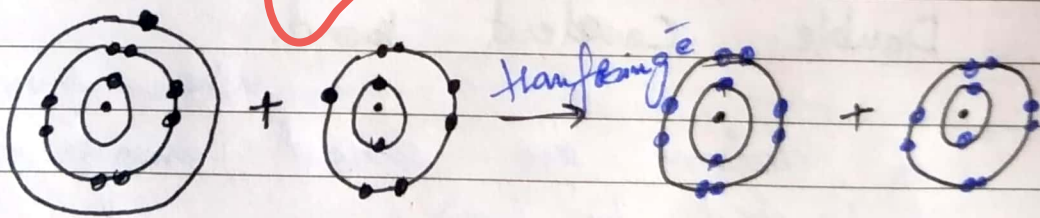
Octet Rule:

A rule that refers to the tendency of an atom by either sharing electrons or by transferring electrons.



↳ This rule is only apply for s and p electrons.

↳ Atoms with more or less than 8 valence electrons participate in chemical bonds to attain the octet.

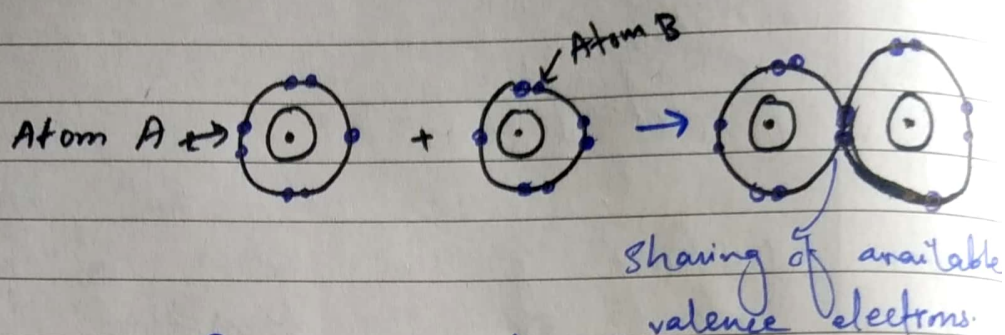


Covalent Bond:

A type of bond where two or more atoms share one or more

electron pairs.

eg



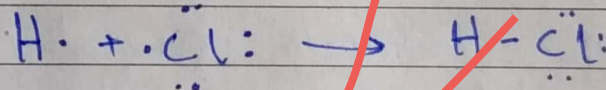
Types Of Covalent bond:

① Single Covalent bond:

When only one electron pair is shared among two atoms.

↳ Denoted by (-).

eg

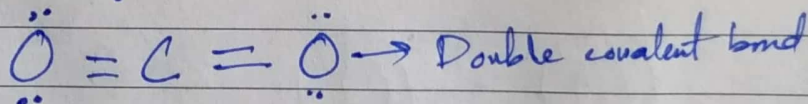


Double Covalent bond:

When two pairs of electrons are shared among two atoms.

↳ Denoted by (=).

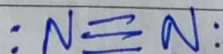
eg



Triple Covalent bond:

When three pairs of electron are shared among two atoms.

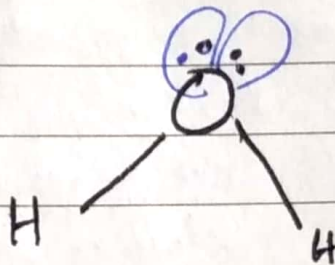
eg



(b)

The shape of water molecules is angular due to the presence of two lone pairs on the oxygen atom.

Detail?



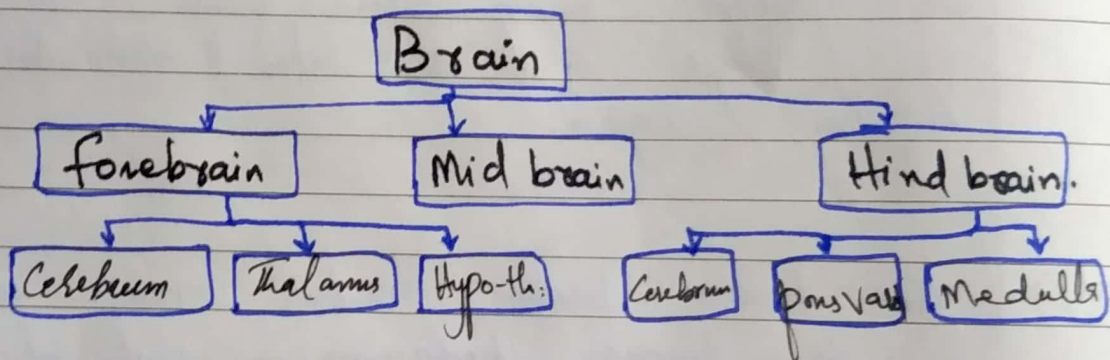
As repulsion among lone pairs is highest the shape of the water molecule becomes angular shaped.

(c)

The human brain controls nearly every aspect of the human body ranging from physical actions to cognitive abilities.

Structure of the Brain:

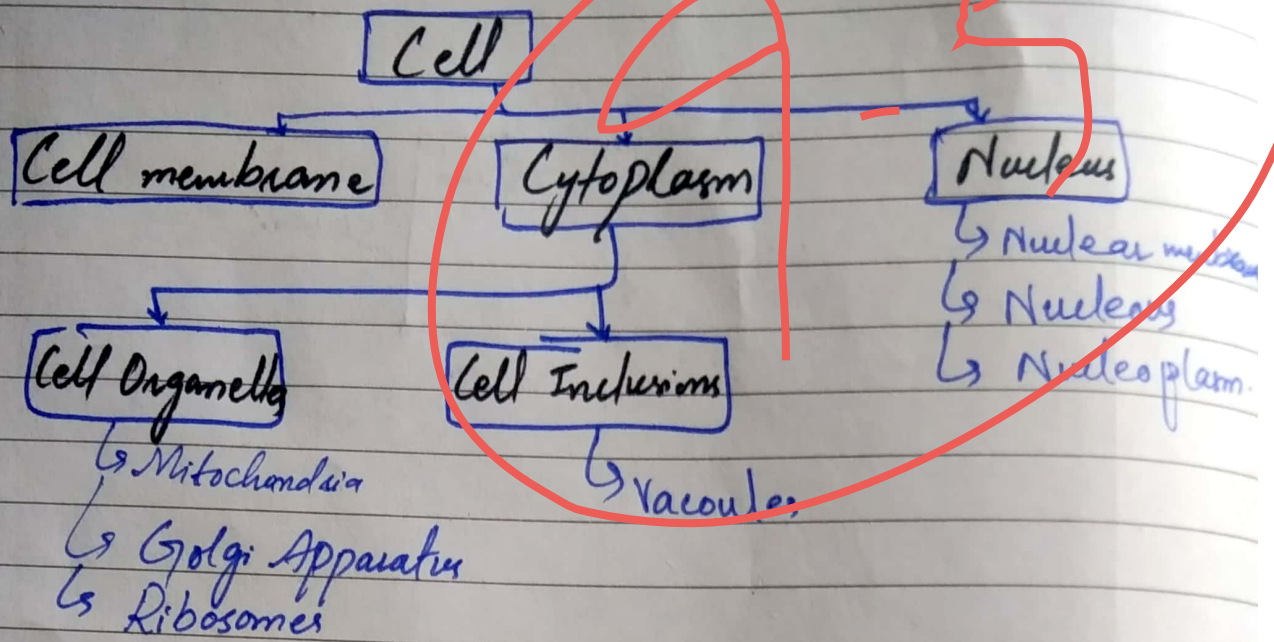
It can be divided into three units: the fore brain, the mid-brain and the hind brain. The hind brain controls the body's vital functions such as respiration and heart rate. The mid-brain control the reflex action and control of eye movement. The forebrain is the source of intellectual abilities.



Functions of the Brain:

It controls thought, breathing, memory, emotions and hunger, ~~that~~ everything that regulates the human body. But these main functions of brain are thoughts, problem solving and planning.

(d) **Cell Structure:** Cells are fundamental units of life. Cell is composed of three units: cell membrane, cytoplasm and nucleus. Every unit of cell performs its own job.



Functions of Subcell Organelles:

- ① Mitochondria: Produce the energy necessary for the cell's survival and functioning.
- ② Golgi Apparatus: A factory in which proteins received from ER are further processed and sorted for transport to their eventual destinations.
- ③ Ribosomes: It is the site of protein synthesis in the cell. It reads the mRNA (messenger RNA) sequence.

Diagram?

Q NOS (a)

SHORT NOTE ON NETWORKING & INTERNET STANDARDS.

Networking is the exchange of information and ideas among people & Computer network is a set of computers sharing resources located or provided by network nodes. It interconnects computing devices that can exchange data and share resources with each other. Internet Standards (IS) ensures that hardware and software produced different vendors can work together. Without IS, it would be difficult to develop networks that can share information. Standards of Internet are also mean that consumers are not locked into one vendor.

(b) Definition Of Artificial Intelligence.

Artificial intelligence (AI) can provide functions to learn from data but cannot make the machines mimic the exact human brain and skills. There are many advantages and disadvantages of AI.

Advantages of AI:

- (i) Highly accurate. So it reduces human error.
- (ii) Easily handle and process big data.
- (iii) Faster decision making by using or fetch processed data.

Disadvantages of AI:

- (i) Increases human dependency on machines.
- (ii) Threats to analytical reasoning of human.
- (iii) Lack of ethics in AI because it is not working on emotions.