

## General Instructions

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.

Section B  
Question-6

(a)

Data:

Total Amount = \$30

Divide it into three parts

second part =  $\frac{1}{4}$  of third part

Ratio between a and b =  $a:b = 3:5$

Find = each part

Solution:-

As we have to find ~~the~~ each part -

and writing wrong references. ~~6~~ is already

given that is 3:5

for b it is said that it is  $\frac{1}{4}$  of the third time that means:

$$b = \frac{1}{4} \times 5$$

$$\boxed{b = 1.25}$$

$$\begin{array}{r} 4 \overline{) 5 \phantom{00}} 1.25 \\ \underline{-4} \phantom{00} \\ 10 \phantom{00} \\ \underline{-8} \phantom{00} \\ 20 \phantom{00} \\ \underline{-20} \\ 0 \end{array}$$

Here we got all three ratios

$$a : b : c$$

$$3 : 1.25 : 5$$

Now, we need to find the share for each.

For this, first we need to find sum of ratios

$$\text{Sum of ratio} = 3 + 1.25 + 5 = 9.25$$

Now, each share.

$$\text{Share for A} = \frac{3}{9.25} \times 370$$

$$\begin{array}{r} 9.25 \\ 40 \\ \hline 000 \\ 3700 \times \\ \hline 370.00 \end{array}$$

$$\boxed{\text{Share of A} = \$120}$$

$$\text{Share of B} = \frac{1.25}{9.25} \times 370$$

$$\begin{array}{r} 40 \\ 1.25 \\ \hline 200 \\ 180 \times \\ 40 \times \times \\ \hline 50.00 \end{array}$$

$$\boxed{\text{Share of B} = \$50}$$

$$\text{Share of C} = \frac{5}{9.25} \times 370$$

$$\boxed{\text{Share of C} = \$200}$$

Hence, the share of A is \$120, share of B is \$50 and share of C is \$300. Am!

(b)

Data:-

Kashif required Rs = 800

Brother give him = 20%

30% of remaining = funded by mother

In his bank he has = Rs. 200

Amount of money he needed = ?

Solution:-

The total amount required is Rs. 800

He borrowed 20% from his brother

$$\text{Borrowed} = \frac{20}{100} \times 800$$

from brother

$$\boxed{\text{Borrowed from brother} = 160 \text{ Rs}}$$

$$\text{Remaining rupees needed} = 800 - 160$$

$$\boxed{\text{Remaining} = 640 \text{ Rs}}$$

Then his mother funded him 30% of the remaining. i.e

$$= \frac{30}{100} \times 640$$

$$\boxed{\text{Mother} = 192 \text{ rupees funded}}$$

Saving in Bank, Kashif has = Rs. 200

Total rupees he could collect till now,

By brother + By mother + saving in Bank  
Rs 160 + Rs 192 + Rs 200

Total rupees he collected = Rs. 552

Now, we need to find <sup>the remaining</sup> fee he required =

Total fee - rupees collected  
800 - 552

Amount needed = Rs. 248

so, the amount he needed to pay his fee is Rs. 248.

Ans.

(C)

Data:-

Total bags = 3

Bag 1 contain = 3 red, 7 black balls

Bag 2 contain = 8 red, 2 black balls

Bag 3 contain = 4 red, 6 black balls

Find the probability that if the red ball is draw, it is from third bag

Solution:-

First we need to know the probability for each bag.

$$P(\text{bag 1}) = \frac{1}{3}$$

$$P(\text{bag 2}) = \frac{1}{3}$$

$$P(\text{bag 3}) = \frac{1}{3}$$

$\therefore$  Since ~~all~~ total bags are 3 and 1 is selected, so the probability is  $\frac{1}{3}$  for each bag.

Now, probability for red from each bag.

$$P(\text{red}|\text{bag 1}) = \frac{3}{10}$$

$$P(\text{red} | \text{bag}_2) = \frac{8}{10}$$

$$P(\text{red} | \text{Bag}_3) = \frac{4}{10}$$

Now,

Need to find the probability for red from bag 3

$$\text{probability} = \frac{\text{favourable outcomes}}{\text{Total outcomes}}$$

$$\text{Probability} = \frac{1}{3} \times \frac{4}{10}$$

(Red from Bag 3)

$$\frac{1}{3} \times \frac{3}{10} + \frac{8}{10} \times \frac{1}{3} + \frac{1}{3} \times \frac{4}{10}$$

$$\text{probability} = \frac{4}{30}$$

$$\frac{3}{30} + \frac{8}{30} + \frac{4}{30}$$

$$= \frac{4}{30}$$

$$\frac{3+8+4}{30}$$

$$30$$

$$\frac{4}{30}$$

$$= \frac{4}{30}$$

$$\frac{15}{30}$$

$$\frac{30}{30}$$

$$= \frac{4}{30} \times \frac{2}{1}$$

$$= \frac{8}{30} = \frac{4}{15}$$

So, the probability for red ball from bag 3 is  $\frac{4}{15}$

Ans

(d)

Data:-

traffic lights at three different crossing change after every:

24 sec, 36 sec, 72 sec

If all change simultaneously at 8:20 hrs at what time will they again change simultaneously = ?

Solution:-

For this we need to find the least common multiplier

2	24, 36, 72
2	12, 18, 36
2	6, 9, 18
3	3, 9, 9
3	1, 3, 3
	1, 1, 1

$$\text{L.C.M} = \underbrace{2 \times 2 \times 2}_4 \times \underbrace{3 \times 3}_{24} = 72$$

$$\begin{array}{r} 21 \\ 3 \\ \hline 72 \end{array}$$

$$\text{L.C.M} = 72 \text{ sec}$$

The lights previously changed simultaneously at 8:20:00 hrs, now they will again change simultaneously after 72 seconds. so the time would be:

8:21:12 hrs.

Ans.

### Question #08

(a) Data:-

$$\text{speed}_1 = 40 \text{ km/h}$$

$$\text{speed}_2 = 60 \text{ km/h}$$

$$\text{Average speed} = ?$$

solution:-

The formula to find average speed is

$$\text{Average speed} = \frac{2 \times S_1 \times S_2}{S_1 + S_2}$$

Since we are given with both the speeds of the journey.



Put values in the formula.

$$\text{Avg speed} = \frac{2 \times S_1 \times S_2}{S_1 + S_2}$$

$$\text{Avg speed} = \frac{2 \times 40 \times 60}{40 + 60}$$

$$\text{Avg speed} = \frac{4800}{100}$$

$$\boxed{\text{Avg speed} = 48 \text{ km/h}}$$

$$\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \\ \times 60 \\ \hline 4800 \end{array}$$

The average speed of the car is  
48 km/h.  
Ans.

(b)

Data:-

ROSE coded as 6281

CHAIR coded as 73456

PREACH coded as 981473

SEARCH = ??

Solution:-

De-coding the code for every  
alphabet

R	O	S	E
6	2	8	1

R	0	S	E
6	2	8	1

C	P	A	R
7	3	4	5

⇒ R = 6  
A = 4  
E = 1  
C = 7  
H = 3

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

Hence the word SEARCH would be coded as

S	E	A	R	C	H
8	1	4	6	7	3

Ans

(C)

Data:-

A = Brother of B

B = Sister of C

C = Father of D

Find Relation between D and A

D is a male member.

Solution:-

Firstly separate male and female members

male = A, C, D

female = B.

As, it is mentioned that B is sister of C and A is brother of B  
so it means A, B and C are siblings.

Out of them A and C are brothers and C is sister.

Further it is said that "C" who is brother of A and B is father of "D".

So, the relation between A and D is

A = Brother of C

D = Son of C

So, the relation between D and A is of uncle and Nephew

Ans.

Who is uncle and who is nephew?

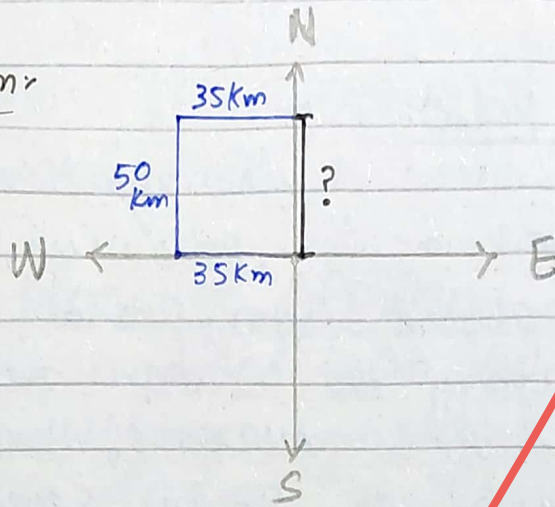
(d) Data-

Kashmala traveled:

- Towards west = 35 Km
- takes a right turn and travel 50 Km more
- Another right turn and travel 35 Km.

How far is she from her original position = ?

Solution:



As it is clear from the figure that she moved 35 km ~~to~~ to west then right turn and 50 km ~~to~~ north and again she took a right turn and move 35 km.

So now Kashmala is 50 km away from her original position.

### Question 3

(a)

#### What is Polio:-

Polio is a severe acute infectious disease caused by the poliovirus, which can spread from person to person, damaging the central nervous system and motor neurons, resulting in flaccid paralysis. It has severe consequences like: inability to move limbs, difficulty in breathing and eventually leading to paralysis and death. Polio cases have decreased by over 99%. Since 1998, from 35,000 cases to 74 reported in 2015.

#### What causes polio virus?

Polio or poliomyelitis is caused due to one of the following three strains of polio virus in the same family of enteroviruses that cause hand, foot and mouth diseases and meningitis. It enters through mouth by eating contaminated food or drinking contaminated water.

once the disease is inside the body, the virus moves to stomach and colon, serving as the disease's reservoir. It multiplies in lymph nodes, liver, and spleen.

### Symptoms of Polio:-

People infected with the polio virus have varying symptoms but can spread disease to others while asymptomatic. A vast majority of the infected people exhibit no symptoms. Only 1-2% of the infected person develops severe symptoms that are as follows.

1. Fever
2. Vomiting
3. Fatigue
4. Headache
5. Stiffness in the back
6. Pain in the limbs.

### Difference between IPV and OPV

IPV and OPV are two different types of vaccines for polio. IPV stands for Inactivated polio vaccine and

OPV stands for oral polio vaccine.  
Difference between both is mentioned below.

### 1. IPV (Inactivated Polio Vaccine):-

IPV is inactivated polio vaccine, it is a live attenuated vaccine in which inactive form of virus is injected in human body so that it may fight the virus, if ever entered the body. This vaccine is administered in two doses.

1. At the age of two months
2. At the age of four months.

### 2. OPV (oral polio vaccine):-

~~The~~ OPV is oral polio vaccine is an inactivated polio virus vaccine administered by oral drops, at the early years of life.  
The vaccine has 04 doses.

1. From birth to 02 months
2. From 04 to 06 months
3. From 12 to 18 months
4. From 3 to 4 years.

(b)

Name the two parts of Nervous System.

The mammalian nervous system is made up of two major part

1. Central Nervous system (CNS)
2. Peripheral Nervous system (PNS)

Brain and spinal cord forms the central nervous system. whereas, cranial and spinal nerves ~~to be~~ which form peripheral nervous system. The nervous system is our body's ~~term~~ decision and communication center.

Briefly describe CNS:-

CNS is the central nervous system. It is the processing center for the nervous system. It receives information from and sends information to the peripheral nervous system. Both the brain and spinal cord are protected by three layers of connective tissues called the meninges.



## Describe Alzheimer Disease..

### Introduction:-

Alzheimer's disease is the most common type of dementia. It is a progressive disease beginning with mild memory loss and possibly leading to loss of the ability to carry on a conversation and respond to the environment.

### Current statistics about the disease:-

In 2022, as many as 5.8 million American were living with Alzheimer's disease. It is less common in young people. The number of people living with this disease doubles every 5 years.

### Warning sign of Alzheimer's disease.

Alzheimer's disease is not a normal part of aging. Some of the symptoms associated with Alzheimer's are:

1. Memory loss that disrupts daily life, such as getting lost in a familiar place and repeating questions.
2. Trouble handling money and paying bills.

3. Difficulty completing familiar task at home.
4. Decreased judgement
5. Change in mood, personality, or behaviour

### How is Alzheimer's disease treated?

Medical management can improve quality of life for individuals along living with Alzheimer's disease.

There is currently no known cure for Alzheimer's disease. Treatment addresses several areas:

1. Helping people maintain brain health
2. Managing behavioural symptoms.
3. Slowing or delaying symptoms of the disease

Q3(c)

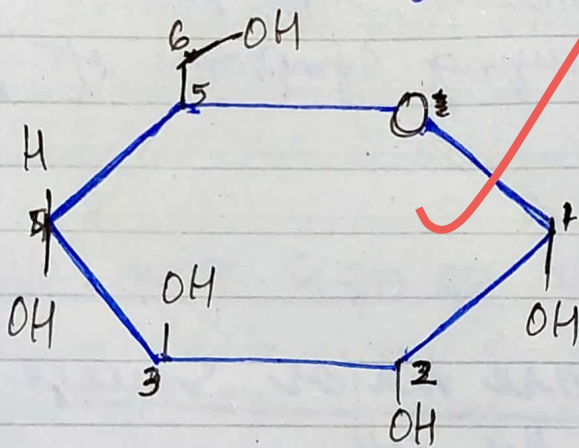
Carbohydrate are major source of energy for the cell:-

Carbohydrate are the main energy source of the human diet, providing 3.9 calories of energy per gram. Body breaks down carbohydrate into glucose, which

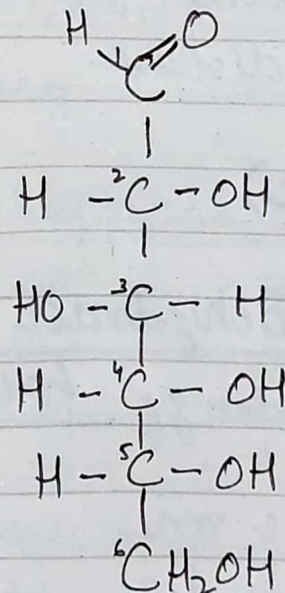
is the main source of energy for our body cells. Glucose can be immediately stored in the liver and muscles for later use.

### Structure of Carbohydrate:-

Carbohydrates are made up of elements of carbon, Hydrogen and oxygen. Each carbon atom is bonded to at least one oxygen atom. All carbohydrates include an aldehyde or ketone group and a hydroxyl group. Carbohydrate may form long chain that are straight or branched.



Structure of  
 $\alpha$  D-Glucose



Glucose chain

## Classification of carbohydrates:-

Carbohydrates are classified into 3 types.  
Simple carbohydrates.

1. Monosaccharide
2. Oligosaccharide
3. Polysaccharide

### 1. Monosaccharide:-

Monosaccharides are often called simple sugars. They cannot be hydrolyzed. The general formula is  $C_n(H_{2O})_n$ . Monosaccharides are sub-divided into ~~glucose~~ triose, tetrose, pentose, hexose, etc.

### 2. Oligosaccharide:-

Oligosaccharides are compound sugars that yield 2 to 10 molecules of the same or different monosaccharides on hydrolysis. Two ~~mono sac~~ monosaccharides can be linked together to form a double sugar or disaccharide.

### 3. Polysaccharide:-

Polysaccharides are compound sugars and yield more than 10 molecules of monosaccharides on hydrolysis. They

may be homo polysaccharide. The general formula is  $(C_6H_{10}O_5)_n$ . Examples of homo polysaccharide are:- starch, glycogen, cellulose, etc.

### Functions of carbohydrate:-

1. Carbohydrates are chief energy source for the body cells.
2. Stored carbohydrates act as a energy source instead of proteins.
3. Carbohydrates aid in regulation of nerve tissue and is the energy source for brain.
4. Carbohydrates break down fatty acids and prevents ketosis.
5. Carbohydrates assist in lipid metabolism.

Q 3(d)

### Preservatives:-

Preservatives are added to food to help prevent or slow spoilage due to bacteria, molds, fungi or yeasts. It also prevent changes in food's color, flavour or texture, delay rancidity, and maintain freshness.

## Importance of food preservatives:-

preservation methods helps inhibit bacterial growth. Following are the reasons why food preservatives are important.

### 1. To minimise pathogenic bacteria:-

Food in long term storage is at serious risk of spoilage due to bacteria such as: E. coli, salmonella and other pathogens. but food preservation the conditions of growth of bacteria and prevent spoilage.

### 2. To keep food at its best quality:-

In many cases, mild spoilage doesn't make food unsafe to eat, but it significantly affects its taste, texture and appearance. Proper food preservation retain these qualities as well as nutritional value of certain food.

### 3. Making the seasonal food available throughout the year:-

Preservation is important because it helps in preserving seasonal

foods that are not available throughout the year and help in enjoying out of season food as well.

### Antioxidants:-

Antioxidants are the substances that inhibit oxidation, especially one used to counteract the deterioration of stored food products. A diet high in antioxidants may reduce the risk of many diseases (including heart disease and certain cancers).

### Importance of anti-oxidants:-

Antioxidants are powerful compounds in our food. Following are the importance of the antioxidants in food.

#### 1. Antioxidants keep our immune system strong and working:-

Many of natural cellular processes in our body creates wastes, some of which form free radicals. Antioxidant neutralize these highly reactive substances, which can damage our body and can lead to inflammation.

## 2. Lower risk of stress related diseases:-

Studies has showed that higher risk of antioxidants-rich fruits, vegetables and legumes are associated with a lower risk of chronic oxidative stress-related diseases like cardiovascular diseases, cancer and deaths from all causes.

## 3. Antioxidants are anti-inflammatory, anti-aging and anti-atherosclerosis:-

Natural antioxidants are widely distributed in food and medicinal plants. These natural antioxidants especially polyphenols and carotenoids, exhibits a wide range of biological effect. They helps in anti-inflammatory, anti-aging and anti-atherosclerosis.