

## (SECTION - II)

Q#6(a) A primary school had an enrollment of 850 pupils in Jan 2022. In Jan 2023, the enrollment was 1120, what was the increase percentage for the enrollment?

Ans: Given data:

enrollments in Jan 2022 = 850

enrollments in Jan 2023 = 1120

To find:

increase percentage = ?  
for enrollment

Solution:

To find increase percentage, let's first find out no. of enrollments increased by following formula:

$$\text{increase in no. of enrollments} = \frac{\text{Enrollments in 2023} - \text{Enrollments in 2022}}{\text{Enrollments in 2022}}$$

$$= \frac{1120 - 850}{850}$$

$$= \frac{270}{850}$$

So 270 more students enrolled in 2023 as compared to 2022.

Using formula:

$$\text{percentage of increase} = \frac{\text{increase in no.}}{\text{initial enrollments}} \times 100\%$$

$$= \frac{270}{850} \times 100\%$$

$$= 31.7\%$$

Therefore, the percentage increase in enrollment in final year is 31.7%.

(b) A man is 5 times as old as his son, two years ago the sum of squares of their ages was 114, Find the present age of son.

Answer: Since the ages of both father and son are unknown, let's assume that their current ages are  $F$  and  $S$  respectively. Then according to given statement:

$$F = 5S \quad \text{--- (1)}$$

But 2 years ago

~~$$F + S = 114$$~~

$$(F-2)^2 + (S-2)^2 = 114 \rightarrow \text{(2)}$$

putting the value of  $F$  in eq (2)

$$(5S-2)^2 + (S-2)^2 = 114$$

~~now using formula~~

now expanding above equation by using formula  $(a-b)^2 = a^2 - 2ab + b^2$

$$25S^2 - 20S + 4 + S^2 - 4S + 4 = 114$$

After simplifying whole eq and then rearranging it we get:

$$\frac{25S^2}{2} - \frac{24S}{2} - \frac{106}{2} = 0 \quad \text{--- (3)}$$

$$13S^2 - 12S - 53 = 0 \rightarrow \text{(3)}$$



- Using quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Here  $x = S$        $a = 13$        $b = -12$

$$c = -53$$

$$S = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(13)(-53)}}{2(13)}$$

$$= \frac{12 \pm \sqrt{144 + 2756}}{26}$$

$$= \frac{12 \pm \sqrt{2900}}{26}$$

The two possibilities that can be derived are:

$$S = \frac{12 + 53.8}{26}$$

$$= \frac{65.8}{26}$$

$$S \approx 2.5$$

$$S = \frac{12 - 53.8}{26}$$

$$= \frac{-41.8}{26}$$

$$S \approx -1.7$$

Since age can not be in negative, the only right answer left is 2.5 yrs.

(C) A man has some hens

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Answer: Given values

$$\text{no. of heads} = 40$$

$$\text{no. of feet} = 140$$



To find:

no. of hens = ?

Solution:

lets assume no of cows =  $x$   
and no. of hens =  $y$

according to given statement total  
no. of heads are 48 and  
since each cow and hen  
has one head:

$$x + y = 48 \rightarrow \textcircled{1}$$

Similarly no. of feet given  
are ~~104~~ 140 while each cow  
has 4 feet and each hen  
has 2 therefore:

$$4x + 2y = 140 \rightarrow \textcircled{2}$$

dividing eq.  $\textcircled{2}$  by 2 we get

$$2x + y = 70 \rightarrow \textcircled{3}$$

no subtracting eq  $\textcircled{1}$  from  $\textcircled{3}$

$$2x + y = 70$$

$$- x + y = 48$$

$$\hline x + 0 = 22$$

$$x = 22$$

putting value of  $x$  in eq  $\textcircled{1}$

$$22 + y = 48$$

$$y = 48 - 22 \Rightarrow y = 26$$

Hence the man has 26 hens.



(d) A runs at a speed of ---

Answer: Given values:

$S_1 =$  Speed during 1<sup>st</sup> half of journey = 40 km/h

$S_2 =$  speed during 2<sup>nd</sup> half = 60 km/h

To find: average speed =  $S_{avg} = ?$

Solution:

The average speed can be found by using formula:

average =  $\frac{\text{sum of all values}}{\text{total no. of values}}$

$$S_{avg} = \frac{S_1 + S_2}{2}$$

$$= \frac{40 + 60}{2}$$

$$= \frac{100}{2}$$

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

The average speed during whole journey was 50 km/h.

Q#7 (a) A number is divided by 6 and added with 50. If the total is 60. Find the number.

Answer:

~~Given values.~~

Let's assume the number is  $x$ . Then, according to given statement if  $x$  is first divided by 6 and then added into 50 we will get 60 which means:

~~$x \div 6 + 50 = 60$~~

~~$$x \div 6 + 50 = 60$$~~

~~$$x \div 6 = 60 - 50$$~~

$$\frac{x}{6} + 50 = 60$$

Rearranging above equation by moving numbers to one side and keeping variable on other:

$$\frac{x}{6} = 60 - 50$$

~~$$\frac{x}{6}$$~~

$$6 \times \frac{x}{6} = 10 \times 6$$

$$x = 60$$

The original number was 60.

(b) Find the odd one out:  
8, 16, 24, 34, 40, 48



Answer:

Looking closely at given series it appears the <sup>numbers follow</sup> a pattern of multiples of 8 in order of 1 to 6 as:

$$8 \times 1 = 8$$

$$8 \times 2 = 16$$

$$8 \times 3 = 24$$

$$8 \times 4 = 32$$

$$8 \times 5 = 40$$

$$8 \times 6 = 48$$

Comparing this pattern with given series reveals that 36 is the odd one out as it is not a multiple of 8.

(C) A tower is 15m tall ---

Answer:

Given values:

height of tower =  $h = 15\text{m}$

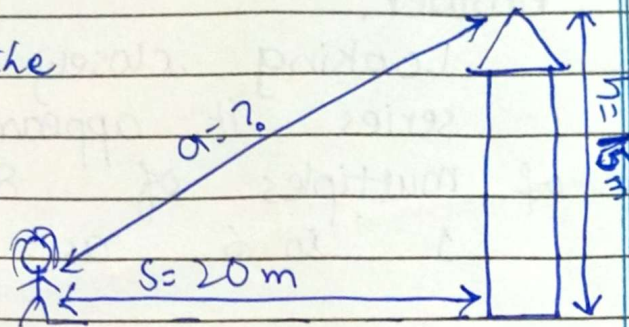
distance from base =  $s = 20$

To find: Aerial distance =  $a = ?$

Solution:



Considering the position of person and all the measurements



given we get a shape similar to a right angled triangle.

Therefore we can apply Pythagorean theorem to this situation.

According to Pythagorean theorem.

$$(\text{Hyp})^2 = (\text{Base})^2 + (\text{Height})^2$$

here Hyp = a    Base = s &  
Height = h

$$(a)^2 = (s)^2 + (h)^2$$

$$(a)^2 = (20)^2 + (15)^2$$

$$(a)^2 = \frac{400 + 225}{}$$

$$a = \sqrt{625}$$

$$a = 25 \text{ m}$$

The aerial distance from top of tower would be 25m.



(d) In a hotel the tariff for every odd dates ---

→ I can't solve it. Can you

Answer: please attach its solution

Given values: <sup>with my file?</sup>

tariff for odd dates = 1000

tariff for even dates = 2000

Total payment made = 30,000

To find:

No. of days he stayed = ?

Solution.

If actual payment is  $x$   
then payment made on even dates  
is twice <sup>paid on</sup> odd dates ~~2x~~

payments made on ~~even~~

$$\text{~~odd~~ } = \text{~~x + 2x~~ } \quad x + 2x = 30000 \quad \text{--- (1)}$$

Now let's assume the no. of  
odd dates he stayed in  
hotel is  $a$  and no. of  
even dates is  $b$ .

$$\text{then } a = x \quad \text{and } b = 2x$$

Solving eq. (1)

$$\frac{3x}{3} = \frac{30000}{3}$$

$$x = 10000$$

now the payment he made  
for ~~both~~ each kind of dates  
is

(1)

## (SECTION-I)

Q#2 (a): Define the term malnutrition. Write major causes and consequences of malnutrition.

Answer:

Definition: "A condition in which ~~an~~ improper amount of nutrients are available to human body."

This improper amount can be either lack of nutrients availability needed for proper functioning of human body or excessive amount i.e. more than needed.

Causes :

① Inappropriate dietary choices: Unhealth food choices or unbalanced diet with increased amount of one nutrient and not taking other at all can cause malnutrition.

② Low income :

Children during growing age need a balanced amount to grow well. Households with low income are unable to provide this balanced diet causing children to become malnourished.



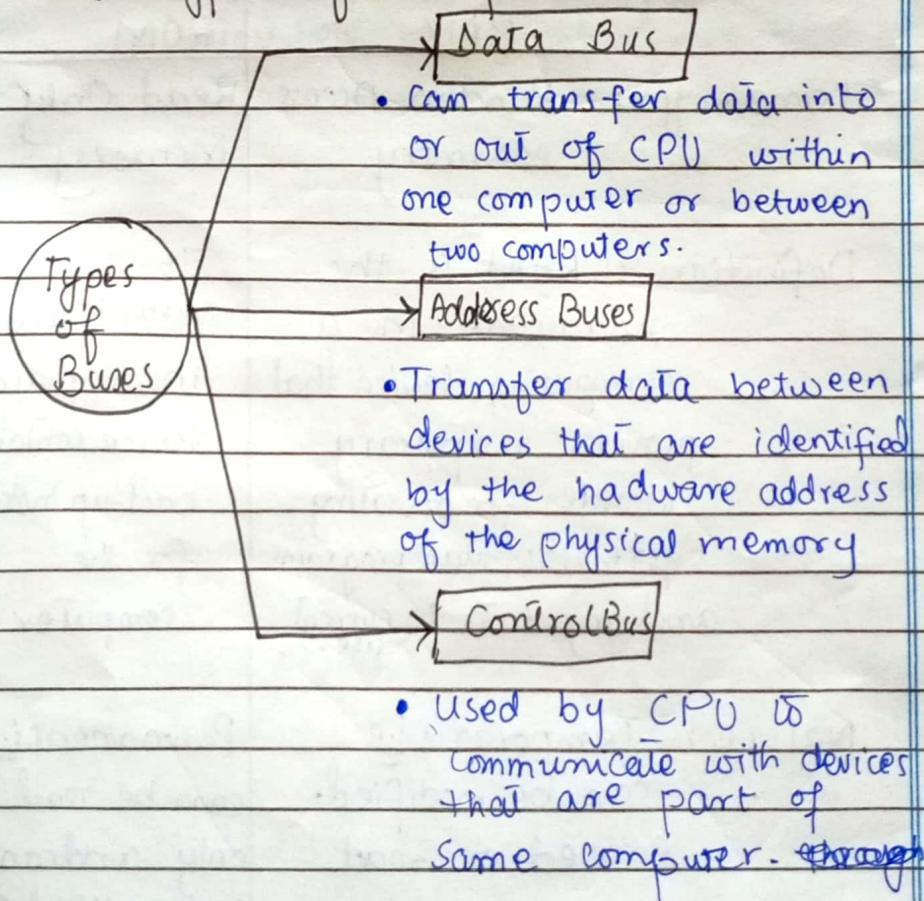
(c) What are computer buses differentiate between RAM & ROM.

Answer:

### Computer buses:

Computer buses are a computer component used to transfer data between other components of computer. A bus consist of <sup>many</sup> parallel lines with each line having carrying capacity of 1 bit.

### (a) Types of Computer buses





## Consequences of malnutrition:

### ① Weight loss:

Due to malnutrition a person starts losing weight drastically.

### ② Loss of appetite:

A malnourished person loses his appetite and does not feel hungry even if he does not eat for whole day.

### ③ Fatigue and tiredness:

A malnourished person always feels tired and cannot concentrate on anything properly.

### ④ Weaker immune system:

A ~~malnourished~~ person suffering from this condition has a weaker immune system making him prone to falling sick like catching cold easily and inability for wounds to heal quickly.



(b) Differentiate b/w food contamination & adulteration?

Answer: Food contamination and adulteration can be differentiated on following bases

① Definition.

Food Contamination	Food Adulteration
It refers to presence of harmful substances into food that may cause health risk.	It refers to deliberate addition of harmful or prohibited substances to food.

② Nature

Food contamination	Food adulteration
It is accidental and often due to improper handling, storage or hygiene.	It is deliberate and done with intent to deceive customers and increase profit.

③ Source

Food contamination	Food adulteration.
It can be caused by poor sterilization of tools used, or contaminated air.	Adding chemicals to food or removing useful nutrient from food by manufacturers or processors.

## ④ Health Risks

Food Contamination	Food adulteration.
Food contamination often results in food borne illnesses or toxic effects	It may cause health issues due to toxic substances or deficiency of nutrients.

## ⑤ Intention

Food contamination	Food Adulteration
It is unintentional and accidental	It is intentional and motivated by economic or fraudulent purposes.

⇒ Example of Food Contamination and adulteration:

- Presence of E. coli in vegetables due to improper washing is contamination.
- Mixing milk with water is an example of adulteration.



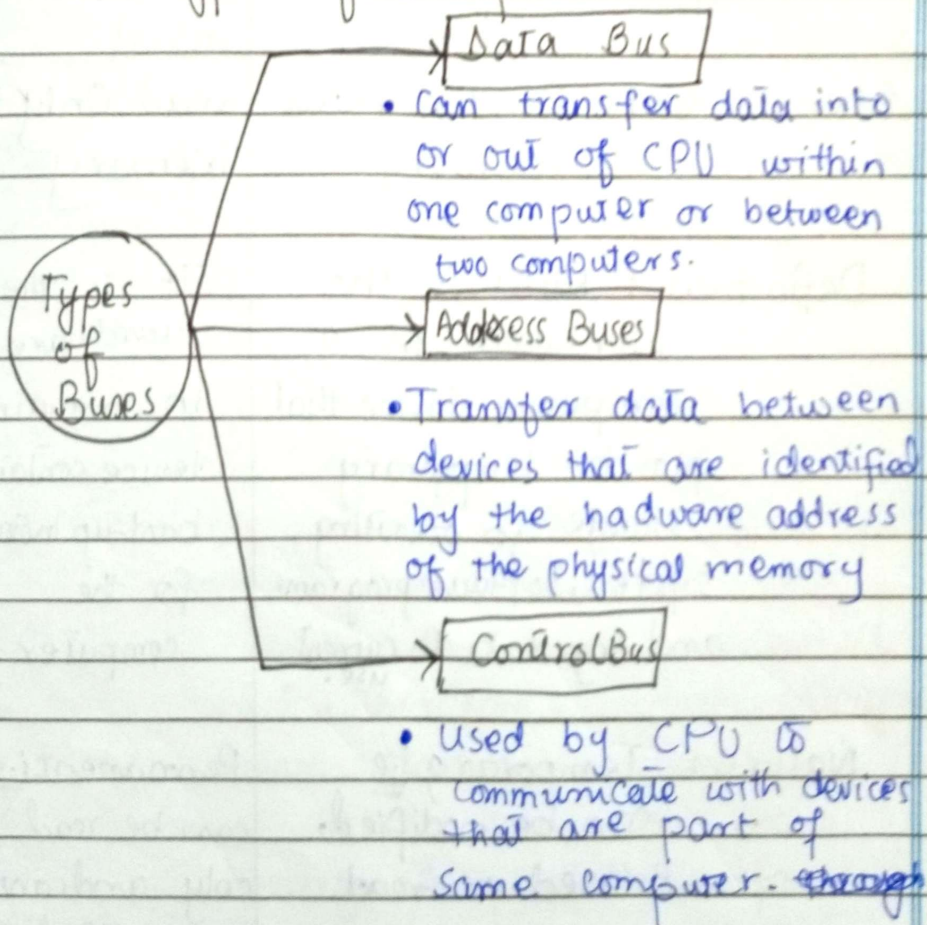
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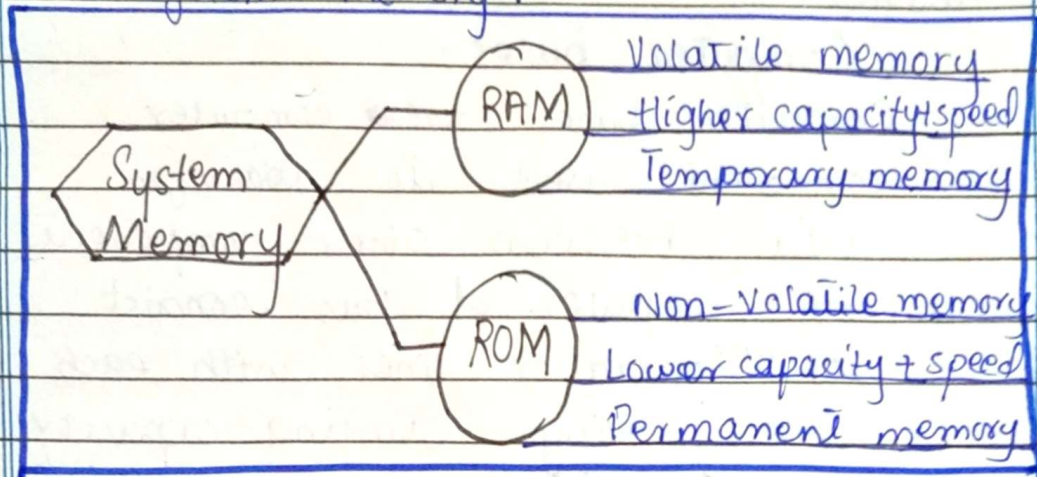
(a) Types of Computer buses





## Difference between RAM and ROM:

RAM and ROM are two types of system memory.



Following are the major differences between RAM & ROM.

RAM	ROM
Stands for: Random Access Memory	Read Only Memory
Definition: RAM is the hardware in a computing device that provides temporary storage for operating system, software programs and any data in current use.	It is the hardware in computing device containing boot-up instructions for the computer
Nature: Temporary i.e. can be modified, erased or read.	Permanent i.e. can be read only and cannot be modified or erased.



use:	Used by CPU in <del>different</del> <sup>to</sup> process <del>tasks</del> current instructions	used by <del>by</del> <sup>to</sup> bootstrap the computer
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Volatility:	Data of RAM is very volatile, it will <del>remain</del> <sup>be lost</sup> if there is interruption of power.	It is non-volatile; remain <del>saved</del> <sup>remain</sup> even after interruption of power
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(d) What are geo-stationary satellites? Distinguish natural & artificial satellites, how many artificial satellites of Jupiter are there?

Answer:

### Geo-Stationary Satellites:

① Definition:

Satellites that orbit at an altitude of 36,000 km with such a speed that it takes 24 hrs to complete one ~~rotation~~ <sup>orbit</sup>. Since this time is equal to Earth's rotational period, therefore, these satellites appear stationary from earth and hence the name geo-stationary. The whole surface of earth can be covered using 3

geo-stationary satellites. Each covers a ~~lat~~ longitude of  $120^\circ$ .

Orbital speed of geo-stationary satellite:

The orbital speed of geo-stationary satellite is  $11,000 \text{ km/h}$ .

Difference between Orbital Artificial v/s Natural Satellite:

Satellites are the objects that revolve around planets or any another object. There are two different types of satellites; Artificial and Natural satellite. These two types differ on following basis:

- ① A natural satellites exist naturally in space while artificial satellites are human built objects launched into orbits using rockets.
- ② An Artificial satellite is designed for a specific purpose like communication, weather monitoring, navigation and research e.t.c. while a natural



has no specific purpose and exist solely due to gravitational force.

- (3) Examples of natural satellites include moons orbiting planets while that of Artificial satellites are GPS, ~~cosmos~~ Hubble space etc.

No. of Artificial satellites of Jupiter:

Jupiter has no artificial satellite orbiting around it.

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