

DAY: _____

DATE: _____

Q6

① Apple : Berry : Cherry : Date
3 : 6 : 2 : 5

if apple exceed date candies by 35

How many berry candies are there?

(error in question statement?)

$$\text{Apple} = 5x + 35$$

$$5x = 3x + 35$$

$$3x = 5x + 35$$

$$2x = 35$$

$$2x = -35$$

$$x = 17.5$$

$$x = \frac{-35}{2}$$

$$\text{Berry} = 17.5 \times 6$$

$$= 105.0$$

$$\boxed{\text{Berry} = 105 \text{ candies}}$$

b). Price = \$200

Disc = 25%

Tax = 6%

$$\text{Discounted Price} = 200 \times \frac{25}{100} = 50 \Rightarrow \boxed{\$150}$$

$$\text{Tax on Price} = \frac{3.6}{100} \times 150 = \$9$$

$$\text{Total Price Paid} = \underline{\underline{\$159}}$$

DAY: _____

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c) Distance = 36 km

Speed = 18 km/h

Start time = 1 pm

Hours needed = $\frac{36 \text{ km}}{18 \text{ km/h}} = 2 \text{ hrs}$

Time needed = 2 hours

End time 3 pm

d) Unscramble

1- S.T S T A I C I T S $\rightarrow$ STATISTIC

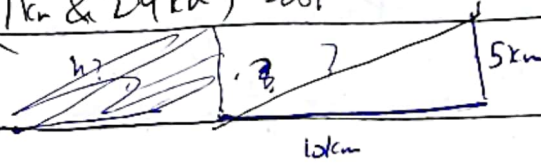
2. L G E B M A R $\rightarrow$ ALGEBRA (should be) (mistake?)

DAY: _____

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Q No 8

a) (7km & 24km) loop



$$h = \sqrt{10^2 + 5^2} \quad \Rightarrow \quad \sqrt{100 + 25} \quad \Rightarrow \quad \sqrt{125}$$

$$h = \sqrt{7^2 + 24^2} = \sqrt{49 + 576}$$

$$h = \sqrt{625} = 25 \text{ km}$$

$$\text{Perimeter} = 25 + 24 + 7$$

$$= 56 \text{ km (loop distance)}$$

$$\text{Total distance walked} = 56 + 10 + 5$$

$$\boxed{\text{Total Distance} = 71 \text{ km}}$$

$$\text{Distance from the start} = \sqrt{10^2 + 5^2}$$

$$= \sqrt{125}$$

$$\boxed{\text{Distance from the start} = 5\sqrt{5} \text{ km}}$$

Q No. 8

b)

Total amount = Rs. 9000

$A = 1/2 B$

$C = 4D$

$E = F$

$B = 3C$

$D = 2E$

$A : B : C : D : E : F$

$12x : 24x : 8x : 2x : x : x = 48$

$x = \frac{94500}{48} = 187.5$

$F = \text{Rs. } 187.5$	$D = \text{Rs. } 375$
$F = \text{Rs. } 187.5$	$C = \text{Rs. } 1500$
$B = \text{Rs. } 4500$	$A = \text{Rs. } 2250$

$$\begin{array}{r}
 64 \\
 1500 \\
 1500 \\
 375 \\
 375 \\
 \hline
 9000
 \end{array}$$

c)

Rectangle

$l \times b \times h = 8 \times 6 \times 4$

$\text{Area} = l \times b = 48 \text{ m}^2 \text{ (2D?)}$

$\text{Volume} = l \times b \times h = 48 \times 4 = 192 \text{ m}^3$

d)

Family = 8 members

Men avg eat = 72kg

Women avg eat = 50kg

Men = Women

$$\begin{array}{l}
 \text{Avg without Anna} = \frac{288 + 200}{8} = \frac{488}{8} = 61 \text{ kg} \\
 \text{Avg with Anna} = 67 \text{ kg}
 \end{array}$$

Anna joins so total jumps up by 1

$$\begin{array}{l}
 \text{Anna eats food} = \frac{488 + x}{9} = 603 \\
 x = 603 - 488 \\
 x = 115 \text{ kg}
 \end{array}$$

$$\frac{488 + x}{9} = 67$$

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$x = 115 \text{ kg}$

Signature: _____

So, Anna ~~was~~ eats 115 kg.

Q No 2

a) Data is the new oil

Data is the new oil because data is running the world in the 21st century. I agree with the notion completely and it can be proven through our day to day life.

I) Autonomous Cars: Autonomous cars work on the Principal of Artificial Intelligence algorithm that has been trained on multiple sources of data so car works ^{Perfectly.}

II) Facial Recognition: Facial recognition in our mobile phone works due to images database on which it has been trained to recognize face to work seamlessly.

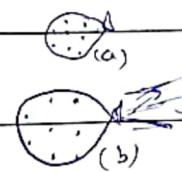
III) Traffic Management & E-challan:

Traffic Management is being done by doing the Past data analysis and E-challan system works by the AI and data management where a traffic violation is noticed and challan is generated and sent autonomously to the offender.

b) Universe is expanding and it has been a Proven fact. The light coming from the galaxies far away have shifted to the red end of the spectrum which showcases that the wavelength of light is increasing due to the increasing distance between the galaxies and earth.

Ballon Blowing Analogy

The expansion of universe imitates the blowing of ballon. When a ballon is blown its points expand just like in universe where the galaxies aren't expanding themselves but are moving away from each other and thus the distance between them is increasing with time just like shown in the above (b) figure of ballon. Just like ballon, universe don't have a center and its expansion is in three dimensions.



Q No. 2

c) Balanced diet included variety of food components from different food group to nurture and support the healthy body functions.

It includes carbohydrates, Proteins, fats, fibers, vitamins and minerals.

For balanced diet, variety of food from different groups should be included like grains, fruit, vegetables, meat, dairy e.t.c. Supplements can also be included in diet wherever necessary.

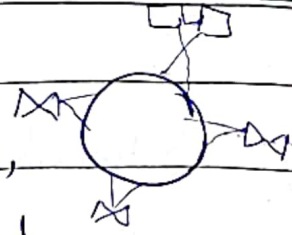
→ Deficiency of Vitamin A causes night blindness.

→ Deficiency of Vitamin D causes Rickets and bones related diseases.

→ Deficiency of Vitamin E causes neurological and vision problems and muscles weakness.

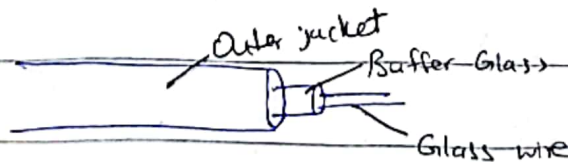
d) I Working of GPS

In global Positioning system, satellites are rotating around earth, covering it from all sides. Satellites transmit and receive information to the ground station and this whole system of coordinated satellites is used to pinpoint the location on the earth. It consist of 30+ satellites revolving around earth.



II Fiber Optics

Thin glass wire that is used to transmit data in the form of light pulses over long distances and at high speed is called fiber optics.



It consist of an outer jacket, buffer glass and glass wire. It works on the Principle of Total Internal reflection.

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Signature: _____

III How 2D and 3D locations are measured by Satellites?

Many satellites cover the earth from multiple sides. To measure the 2D or 3D location, multiple satellites are used to pinpoint the approximate position. The positions sent by multiple satellites are ^{with respect to} not their spatial position and their timestamp and the data of multiple satellites is then resolved to calculate the position and altitude of the user.

Q. No. 3 (b) Doping

The process of adding an impurity in a semiconductor to make its behaviour suitable for intended use is called doping. Doping either creates holes or free electrons in the process.

Example of Semiconductors are Silicon and Germanium.

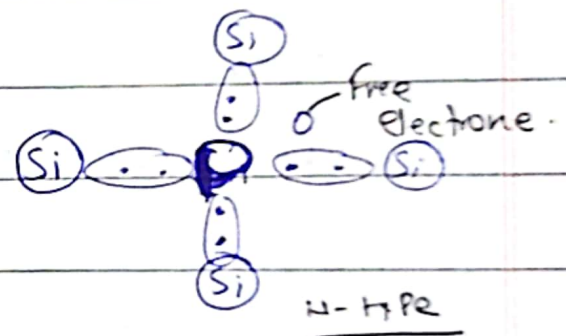
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There are two types of semiconductors :

1. N-type semiconductor
2. P-type semiconductor

N-type semiconductor

A semiconductor which has been doped with an impurity with five electrons forms an N-type semiconductor. It has a free electron



P-type Semiconductor

A semiconductor which has been doped with a trivalent impurity forms a P-type semiconductor.

It has only three electrons

so a hole is formed in it.

It is an acceptor

