SECTION II

QUESTION NO # 5

PART A:

Statement: "Her granddaughter is the only daughter of my brother."

My brother's only daughter = Ahsan's niece
That niece is woman's granddaughter

The grand mother of a brother's daughter is Ahsan's mother

The woman is Ahsan's mother

PART B:

Speed (v) = 12 Km/hr ⇒ 200 m/min
Time (t) = 8 min
Ratio of length & Breadth = 3:2
Perimeter Distance (S) = ?

To find Perimeter or Distance

$$S = v \times t$$
$$S = 200 \times 8$$
$$S = 1600 \ m$$

Ration between length and Breadth
$$L : B = 3 : 2$$
where
$$L = 3x$$
$$B = 2x$$

Perimeter:

$$2(L+B) = 1600$$
$$2(3x + 2x) = 1600$$
$$6x + 4x = 1600$$
$$10x = 1600$$
$$x = 160$$

Length $= 3x = 3 \times 160 = 480$ m
Breadth $= 2x = 2 \times 160 = 320$ m

To find the Area:

$$A = L \times B$$
$$A = 480 \times 320$$
$$\boxed{A = 153600 \ m^2}$$

Part C:

Let the ten's digit $= x$
unit digit $= x + 2$

Number $= (10 \times \text{ten's digit}) + \text{unit's digit})$
$$= 10x + (x+2)$$
$$= 11x + 2$$

Sum of the digits:
$$= x + (x+2)$$
$$= 2x + 2$$

According to the given condition
The number $\times$ Sum of digits $= 144$
$$(11x + 2)(2x + 2) = 144$$
$$2(11x + 2)(x + 1) = 144$$
$$(11x + 2)(x + 1) = \frac{144}{2}$$

$$(11x + 2)(x + 1) = 72$$

Applying the trial method on the given equation (i)

Taking $x = 2$

$$[11(2) + 2][2 + 1] = 72$$

$$(24)(3) = 72$$

$$72 = 72$$

Hence

ten's digit = 2

unit digit = $2 + 2 = 4$

So,

$$\boxed{\text{The number is } 24}$$

Part II:

The ratio of two numbers

$$2 : 3$$

$$2x : 3x$$

Using the give LCM condition

$$2 \times 3 \times x = 6x$$

$$6x = 48$$

$$x = 8$$

If x is 8 then,

$$2x = 2 \times 8 = 16$$

$$3x = 3 \times 8 = 24$$

So, the numbers are 16 and 24 and the sum of the numbers will be;

$$\boxed{16 + 24 = 40}$$

QUESTION NO #7

PART# A

40% of a number is equal to two-third of another number

Let,

    First number = x

    Second number = y

40% of x = $\frac{40 \times x}{10}$, $\frac{4x}{10}$

Two-third of y = $\frac{2}{3} \times y \Rightarrow \frac{2y}{3}$

According to the given condition,

$$\frac{4x}{10} = \frac{2y}{3}$$

$$3(4x) = 2y \times 10$$

$$12x = 20y$$

$$\frac{x}{y} = \frac{\cancel{20}^{10}}{\cancel{12}_6}$$

$$\frac{x}{y} = \frac{\cancel{10}^{5}}{\cancel{6}_3}$$

$$\frac{x}{y} = \frac{5}{3}$$

Therefore,

$$x : y$$

$$\boxed{5 : 3}$$

PART# B

S.P = Cost of 17 ball at selling = Rs 720

loss = Cost price of 5 balls = 5x

$$loss = C.P - S.P$$
$$5x = 17x - 720$$
$$5x - 17x = -720$$
$$-12x = -720$$
$$12x = 720$$
$$x = \frac{720}{12}$$

$$\boxed{x = 60}$$

Therefore,

the Cost price of single ball is ......

PART # C

Father's age = x

Son's age = y = ?

Father is 24 years older than his son
$$x = y + 24$$

Their ages after two years
$$x + 2 = 2(y + 2)$$

Since; x = y + 24

Therefore,
$$(y + 24) + 2 = 2y + 4$$
$$y + 26 = 2y + 4$$

$$y - 2y = 4 - 26$$
$$-y = -22$$
$$\boxed{y = 22}$$

The present age of son is 22

PART # D

- Rashid types 32 pages in 6 hours

  Rate $= \dfrac{32}{6} = \dfrac{16}{3}$ pages / hour

- Kashif writes 40 pages in 5 hours

  Rate $= \dfrac{40}{5} = 8$ pages / hour

Combined rate:

$$\dfrac{16}{3} + 8 \implies \dfrac{16 + 24}{3}$$

$$\dfrac{40}{3} \text{ pages / hour}$$

Time to type 110 pages together

$$\text{Time} = \dfrac{\text{Total work}}{\text{Combined rate}}$$

$$= \dfrac{110}{40} \implies \dfrac{110 \times 3}{40}$$

$$= \dfrac{33}{4}$$

$$\text{Time} = 8.25 \text{ hours}$$

Converting hours into minutes

$$8.25 \text{ hours} = 8 \text{ hours } 15 \text{ minutes}$$

Therefore,

$$\boxed{\text{Total time to type 110 pages} = 8 \text{ hr } 15 \text{ min}}$$

SECTION # I

QUESTION # 2

PART D:

Cell membrane

Structure:

Cell membrane is a double layer structure made of phospholipids. It comprises of 60-80% protein, 20 -40% lipids and carbohydrates. proteins are embedded in lipid bilayer. **Fluid mosaic model** explains the structure of cell membrane as a mosaic of phospholipids cholesterol molecules, proteins and carbs. It act as a barrier between cell and the surrounding environment.

Function:
- Transport of material
- All individual molecules floating in it.
- maintainance of concentration gradient
- Endocytosis by infolding
- Transmission of nerve impulse

Cytoplasm

Structure:

Cytoplasm is a semi-fluid, non-nuclear content of protoplasm. It is thick and semi-transparent fluid comprise of

ectoplasm and inner granular mass as endoplasm

Function:

- Site of many biochemical reactions
- Provide medium for organelles to remain suspended
- Cytoskeleton provides shape and facilitate movements
- Means of transport of genetic material.

Mitochondria

Structure

Mitochondria is power house of cell. It has two membranes. Inner membrane and outer membrane have intermembrane space between them. Matrix is the space within inner membrane having fluid it and foldings to increase surface area.

Cristae

Matrix

outer membrane

inner membrane
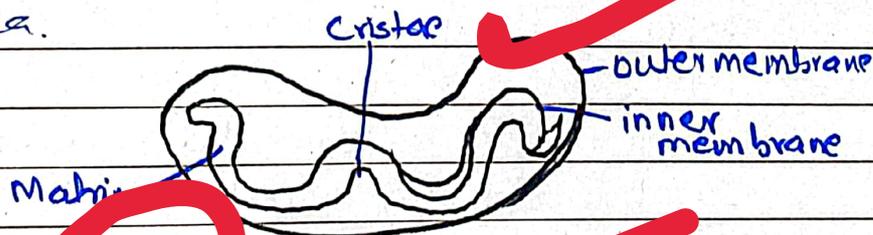
Function:

- Maintaining control of cell cycle and growth
- Use Aerobic respiration to generate adenosine (ATP)
- Provides the source of chemical energy