

GSA Mock

LMS ID: 39207

Section-II

(Section B) Q6 (A)

⊕ represents female

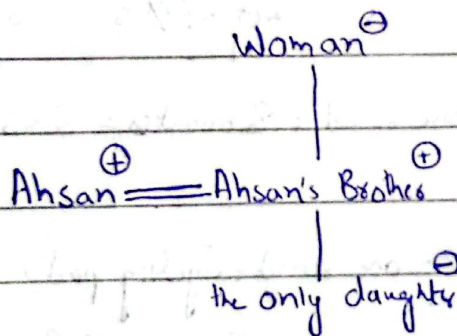
⊖ represents male

= represents siblings

⊕ represents spouse

| represents generations

Solution:



From give data and subsequent pictorial representation, it is most likely that Ahsan's niece is the granddaughter of the woman, Ahsan is pointing to. Therefore the woman is Ahsan's Mother.

Given Data:

$$\text{Length} : \text{Breadth} = 3 : 2 = 3x : 2x$$

$$\text{Speed of cycling by man} = 12 \text{ km/hr}$$

$$\text{Time taken to complete one round} = 8 \text{ minutes.}$$

To Find:

$$\text{Area of Park in } m^2 = ?$$

Solution:

$$\text{Cycling speed} = \frac{12 \text{ km}}{\text{hr}} = \frac{12 \times 1000 \text{ m}}{60 \times 60 \text{ s}} = \frac{20}{6} \text{ ms}^{-1}$$

$$\text{Time to complete one round} = 8 \text{ minutes} = 8 \times 60 \text{ seconds.}$$

$$\begin{aligned} \text{Distance covered in one round} &= \text{Cycling speed} \times \text{time} \\ &= \frac{20}{6} \times 8 \times 60 \text{ m} \end{aligned}$$

$$\text{Distance covered in one round} = 1600 \text{ m}$$

$$\text{So, the Perimeter of Park} = 1600 \text{ m} = 1.6 \text{ km.}$$

Let x be the common factor in ratio so,

$$\text{Length} = 3x$$

$$\text{Breadth} = 2x$$

According to this given condition and using formula of perimeter, we could develop an equation.

$$2 \text{ Length} + 2 \text{ breadth} = \text{Perimeter}$$

$$2(3x) + 2(2x) = 1600 \text{ m}$$

$$6x + 4x = 1600$$

$$10x = 1600$$

$$x = \frac{1600}{10}$$

$$x = 160m$$

So using value of x ,

$$\text{The length} = 3x = 3(160) = 480m$$

$$\text{The Breadth} = 2x = 2(160) = 320m$$

$$\text{The Area of Park} = \text{Length} \times \text{Breadth}$$

$$= 480 \times 320$$

$$= 153600m^2$$

Q6(D)

Given:

$$\text{L.C.M of 2 numbers} = 48$$

$$\text{Numbers in the ratio} = 2:3$$

So two numbers are $2x$ and $3x$

To find:

$$\text{Sum of the numbers} = ?$$

Solution:

Let's find the numbers having 48 as a multiple

$$1 \times 48 = 48$$

$$4 \times 12 = 48$$

$$2 \times 24 = 48$$

$$6 \times 8 = 48$$

$$3 \times 16 = 48$$

$$8 \times 6 = 48$$

So the factors of 48 include 1, 2, 3, 4, 6, 8, 12, 16, 24 ...

So starting from highest factor, let's compare 16 and 24.

$$16 : 24$$

$$8 : 12$$

$$4 : 6$$

$$2 : 3$$

So, 16 and 24 are two numbers having least common Multiple of 48 and are in ratio of 2 and 3.

$$\begin{aligned}\text{Sum of two numbers} &= 16 + 24 \\ &= 40\end{aligned}$$

Q6(c)

Data: given:

Let unit digit = U and Ten's digit = T

$$U = T + 2$$

To find:

$$\text{number} = TU = ?$$

Solution

According to given statement,

$$(TU) \times (10T+U) = 144$$

$$TU(10T+U) = 144$$

putting $U=T+2$ in equation.

$$[T(T+2)] \times [10T+T+2] = 144$$

$$(T^2+2T)(11T+2) = 144$$

$$T^2(11T+2) + 2T(11T+2) = 144$$

$$11T^3 + 2T^2 + 22T^2 + 4T = 144$$

$$11T^3 + 24T^2 + 4T = 144$$

$$11T^3 + 22T^2 + 2T^2 + 4T = 144 \quad (\text{by mid-term break})$$

$$11T^2(T+2) + 2T(T+2) = 144$$

$$(11T^2+2T)(T+2) = 144$$

$$11T^2+2T = 144, \quad T+2 = 144$$

$$11T^2+2T-144=0, \quad T=144-2$$

$$T=142$$

According to given statement,

$$(T+U) \times (10T+U) = 144$$

$$T(10T+U) + U(10T+U) = 144$$

$$10T^2 + TU + 10TU + U^2 = 144$$

$$10T^2 + 11TU + U^2 = 144$$

put $U=T+2$ in equation

$$10T^2 + 11T(T+2) + (T+2)^2 = 144$$

$$10T^2 + 11T^2 + 22T + T^2 + 4T + 4 = 144$$

$$22T^2 + 26T + 4 = 144$$

$$22T^2 + 26T + 4 - 144 = 0$$

$$22T^2 + 26T - 140 = 0$$

$$11T^2 + 13T - 70 = 0$$

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

$$x = \frac{-13 \pm \sqrt{(13)^2 - 4(11)(-70)}}{2(11)}$$

$$x = \frac{-13 \pm \sqrt{169 + 3080}}{22}$$

$$x = \frac{-13 \pm \sqrt{3249}}{22}$$

$$x = \frac{-13 \pm \sqrt{3249}}{22}$$

$$x = \frac{-13 \pm 57}{22}$$

$$x = \frac{-13 + 57}{22}$$

$$x = \frac{-13 - 57}{22}$$

$$x = \frac{44}{22}$$

$$x = \frac{-70}{22}$$

$$x = 2$$

So Tent's value is 2 or 20.

Put $T=2$ in $U=T+2$

$U=2+2=4$ so the number would be 24

Q7(A)

Data:

Let two numbers be x and y .

$$40\% \text{ of } x = \frac{2}{3} \text{ of } y.$$

To find:

$$x : y = ?$$

Solution:

According to given condition,

$$\frac{40x}{100} = \frac{2}{3} y$$

$$\frac{2x}{5} = \frac{2}{3} y$$

$$\frac{x}{y} = \frac{2 \times 5}{3 \times 2}$$

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

$$\text{So } x : y = 5 : 3$$

Q7(c)

Data:

Let, the age of Man = M

and age of son = S

$$\text{At Present, } M = S + 24$$

After 2 years, age of Man = $M+2$

age of son = $S+2$

$$M+2 = 2(S+2)$$

To Find:

Present age of son = ?

Solution:

From given data, two equations are

$$M+2 = 2(S+2)$$

$$M+2 = 2S+4$$

$$M-2S = 4-2$$

$$\boxed{M-2S = 2} \text{ --- (i)}$$

$$M = S+24 \text{ --- (ii)}$$

put eq (ii) in eq (i)

$$S+24-2S = 2$$

$$-S+24 = 2$$

$$\Rightarrow S = 24-2$$

$$S = 22$$

Q7(D)

Given Data:

Rashid's typing speed = $\frac{32 \text{ pages}}{6 \text{ hours}}$

Kamran's typing speed = $\frac{40 \text{ pages}}{5 \text{ hours}}$

To Find:

Time required to type 110 pages altogether = ?

Solution:

$$\text{Rashid's typing speed} = \frac{32 \text{ pages}}{6 \text{ hrs}} = \frac{16 \text{ pages}}{3 \text{ hrs}}$$

$$\text{Kamran's typing speed} = \frac{40 \text{ pages}}{5 \text{ hrs}} = 8 \text{ pages/hr}$$

According to given conditions,

$$\frac{16 \text{ pages}}{3 \text{ hrs}} + 8 \text{ pages/hr} = \frac{110 \text{ pages}}{x}$$

$$\frac{16 + 24}{3} = \frac{110}{x}$$

$$\frac{40}{3} = \frac{110}{x}$$

$$x = \frac{3 \times 110}{40} = \frac{33}{4}$$

$$x = 8.25 \text{ hrs.}$$

$$= 8 \text{ hrs } 15 \text{ minutes.}$$

Q7(B)

Given:

S.P of 17 balls at loss = 720 Rs

Loss = 5 balls C.P.

To Find:

C.P of ball = ?

Solution:

$$\text{Loss} = \text{C.P} - \text{S.P}$$

$$\frac{5\text{C.P}}{17} = \text{C.P} - 720$$

$$\text{C.P} - \frac{5\text{C.P}}{17} = 720$$

$$\frac{17\text{C.P} - 5\text{C.P}}{17} = 720$$

Let C.P be price of 1 ball. So.

Loss = 5C.P. and Total cost price = 17C.P.

$$\text{Loss} = \text{C.P} - \text{S.P}$$

$$5\text{C.P} = 17\text{C.P} - 720$$

$$17\text{C.P} - 5\text{C.P} = 720$$

$$12\text{C.P} = 720$$

$$\text{C.P} = \frac{720}{12} = 60 \text{ Rs.}$$

C.P of 1 ball = 60 Rs.

(Section A)

Q.2
(D)

Cell Wall:

Cell wall is the outermost part of cell which is mainly absent in animal cells. It is present in plant cells and fungi.

Structure:

It is mainly composed of cellulose in plant cells and peptidoglycan in prokaryotic cells. Plasmodesmata connects neighbouring cell walls in plant cells.

Function:

It functions as

- 1) Barrier to external stimuli and protect the inner component of cells.
- 2) It provides strength to cell to maintain its shape and structure.
- 3) It provides rigidity to cells of plants.

Cell Membrane:

Cell membrane is a structure that is present in all eukaryotic and prokaryotic plants and animal cells. In animal cells, it is the outermost structure of cell. In plant cells,

It is present inner to cell wall.

It is composed by phospholipid bilayer with proteins, cholesterol and carbohydrates in it.

Function:

It is very important structure for cell.

as:

- 1) It protects the inner organelles of cell from external environment and keeps cell structure intact.
- 2) It is also called semipermeable membrane as it selectively allows passage of particles across the cell according to needs of cell.
- 3) It also provides strength and mechanical support to cell.

3) Cytoplasm

Cytoplasm is a jelly like semi-fluid structure that provides a base space to all organelles within cell. It extends from nuclear membrane to cell membrane.

Structure:

Cytoplasm is mainly composed of water around 90% with dissolved minerals, waste

material, nutrients. It has further two components cytosol and cyto gel.

Functions:

- 1) It house all the organelles of cell and provide suitable environment to all cell organelles and important cellular activities.
- 2) It provides support to all cellular organelles.
- 3) In addition to it, It has ability to transfer waste material and nutrients from and to cell organelles.

Mitochondria:

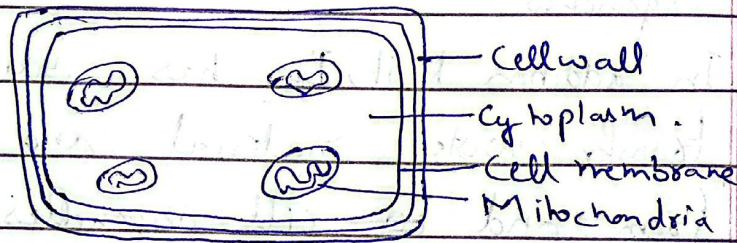
Mitochondria is a double membrane bounded organelle responsible for synthesis of energy currency "ATP".

Structure:

Double membranous mitochondria is divided into two compartments - outer one is called inter membrane space while inner membrane surrounds mitochondrial matrix. F_0 and F_1 protein particles are also attached to invaginations of inner membrane.

Function:

It contains its own DNA and has ability to produce energy in the form of ATP. ATP is called energy currency of cell. Mitochondria, therefore, is called energy house of the cell. It has ability to self-replicate.



Q2(b)

Urinary System:

Urinary System is one of the excretory system responsible for production of urine, excretion of metabolic waste and maintenance of body fluid balance.

Components of Urinary system:

Urinary system is composed of multiple structures mainly.

- 1) Kidneys: pair of kidney responsible for cleaning blood and filtering waste material.
- 2) Ureters: A pair of ureters carry that filtrate called urine to urinary bladder.

3) Urinary bladder having capacity of 500 ml stores urine temporarily before excretion of urine.

4) Urethra: is a small narrow tube like opening that excretes urine out of the body.

All components of urinary system works in coordination for maintg homeostasis.

Working unit of urinary system is Nephron.

Nephron:

Nephron is basic structural and functional unit of kidney. Each kidney contains around 1 million nephrons.

Working of Nephron:

Nephron has further divisions each assigned its own distinct function.

i) Renal corpuscle:

Renal corpuscle contains two structures.

i) Glomerulus:

Glomerulus is ball shaped tuft of capillaries in which blood flows. Due to pressure, waste material is passed to Bowman's capsule.

ii) Bowman's capsule:

Bowman's capsule is a cup shaped

Structure that surrounds Glomerulus and receive filtrate from Glomerulus.

2) Renal Tubule:

Renal Tubule is a tubular structure that carries filtrate to collecting duct. It has further 3 subdivisions.

i) Proximal convoluted Tubule:

Proximal convoluted Tubule carries filtrate from Bowman's capsule to loop of Henle. Reabsorption of minerals take place here.

ii) Loop of Henle

Loop of Henle is J-shaped structure that connects proximal and distal convoluted Tubule.

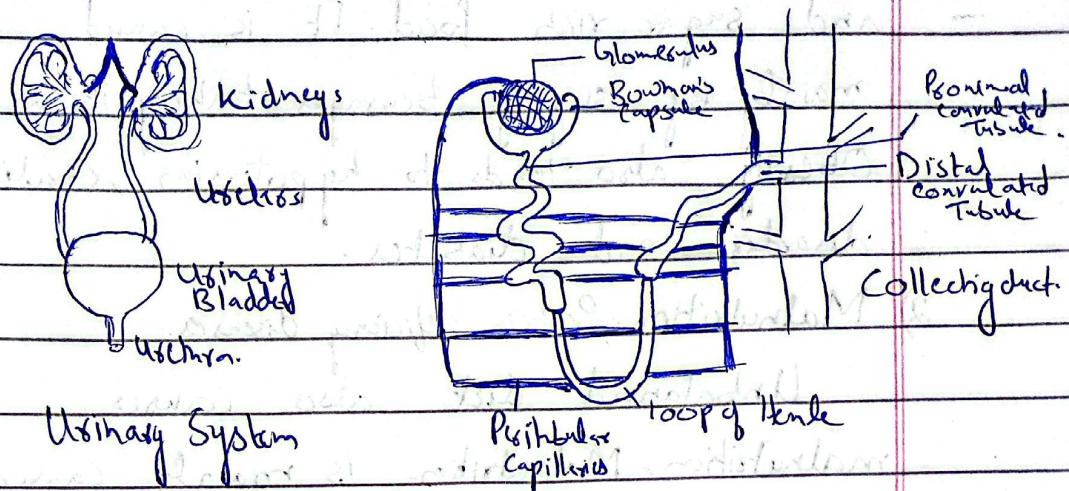
Reabsorption of water and salts continue here.

iii) Distal convoluted Tubule:

Distal convoluted Tubule is last convoluted portion of Nephron

where secretion and reabsorption takes place.

Renal tubule mainly responsible for secretion and reabsorption. It is surrounded by network of capillaries called Peritubular capillaries.



Structure of Nephron.

Q2(c)

Unbalanced Diet:

Unbalanced diet refers to food intake greater than body requirement or food intake that is disproportionate according to recommended balance.

Unbalanced diet is overeating one category of food while avoiding another essential category of food.

Effects of Unbalanced Diet:

Unbalanced diet has multiple effects on healthy living.

1) Obesity:

Obesity is one of the most common manifestation of unbalanced diet especially higher intake of carbohydrates.

and sugar rich food. It is caused mainly by sugary beverages, bakery items. Obesity also leads to hypertension, cardiovascular disorders and diabetes.

2) Malnutrition: Protein deficiency diseases:

Unbalanced diet also causes malnutrition. Malnutrition is mainly caused by lack of protein in diet. This is mainly seen in areas having food crisis or people having vegetarian diet. It is most commonly seen in young children.

Protein deficiency diseases that are commonly seen in children include Kwashiorkor.

Muscle wasting is seen in these cases.

3) Vitamin deficiency diseases:

Vitamin deficiency diseases are also result of unbalanced diet. Rickets, Osteomalacia, poor eyesight, high blindness and scurvy are some diseases that result due to vitamin deficiencies mainly due to unbalanced diet.

4)