Dos and Don'ts for the General Science & Ability Paper

Hi there — you've prepared well! Remember, knowing the content is one thing, but presenting it in the paper exactly as required is another. Here are a few key points to keep in mind:

1. For a 5-mark part, aim to write at least 2 and at most 3 sides of the answer sheet. Often, a question has two or three parts, and the marks are divided accordingly — so address each part fairly.
2. Manage your time wisely — you have about 35 minutes per full question, which comes down to around 8 minutes for each 5-mark part. Stick to this to avoid rushing later.
3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.
4. Neatness matters — keep your handwriting clean, avoid cutting or overwriting.
5. Mind your spelling and grammar — while GSA doesn't deduct marks for these, your expression leaves an impression.
6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

Good luck for CSS 2026 — you're going to ace it, In sha Allah! ⭐

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Section: 216

General Science And Ability

Part II

(Section A)

Question Number 02

(a) Structure of Universe & Big Bang Theory

The structure of universe can be defined by big bang theory.

The term big bang first coined by Sir Fredrick Hoyle. According to Big bang theory, the universe came into an

existance from singularity.

**Universe:**

All known and unknown matter (Energy and space) is known as Universe.

## Known Matter And Energy:

know matter and energy have well defined chemical properties and can be controlled and used.

## Dark Matter And Energy:

Unknown matter and energy is called dark matter and energy which are non-luminous and cannot be controlled.

## STRUCTURE OF UNIVERSE

The universe started from singularity. Heat emmited and from $\bar{e}$ and proton which unite to form atoms like

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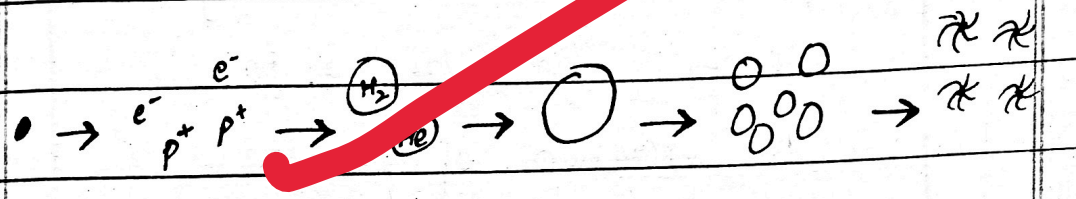
$H_2$ and He. The atoms combine to form nebulas which form stars. The stars along with planets make a galaxy.




| $10^{-32}$ sec | $10^{-12}$ sec | $10^{-4}$ sec | 100 sec | 100,000 sec. |
|---|---|---|---|---|
| e and Proton forms | $H_2$ and He form | Stars form | Galaxy form | Universe form. |

## Evidences Of Big Bang Theory

The big bang theory is evidant from:

1- Microwave emmission.
2- Existance of gases
3- Red shift of galaxies.

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(b)- # URINARY SYSTEM

"An organ system consists of kidney, Ureter, urinary bladder and urethra for the excretion of waste product (urine) from body is known as Urinary System."

## NEPHRON:

Nephron is a functional unit of kidney.

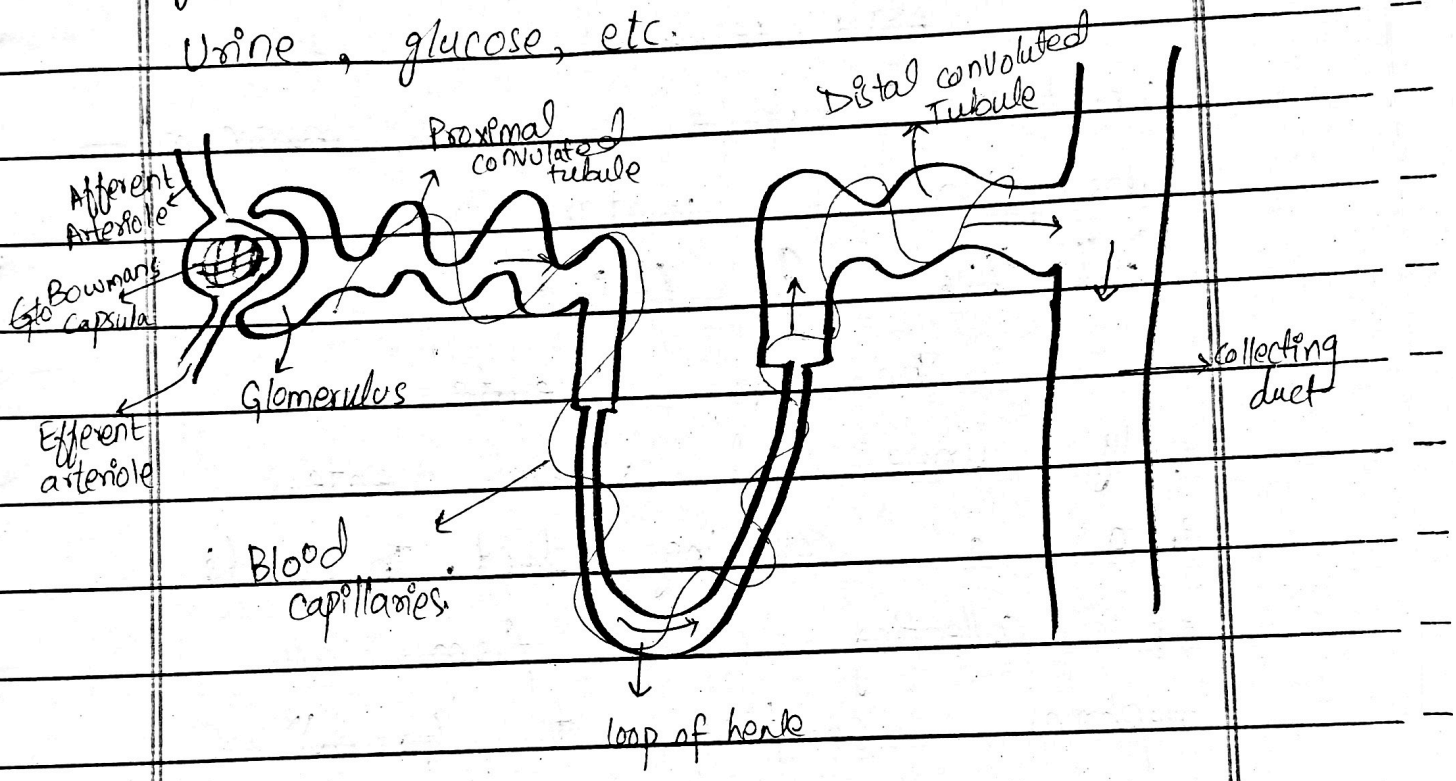
## WORKING OF NEPHRON

Nephron filters blood in three steps:

### 1- Glomerular Filteration:

Blood from afferent arteriole enter into Bowmann's capsule. Blood filters and enters into

the glomerulas. The filterate present in glomerulas is known as glomerular filterate. It contain urine, glucose, etc.




## 2 SELECTIVE ABSORPTION:

The majority of glucose is reabsorbed when glomerular filterate passed from proximal convoluted tubule. About 99% of mass is reabsorbed in the cappillaries.

### Loop of Henle:

$Na^+$ ions and $H_2O$ are

reabsorbed in loop of henle and distal convoluted tubule.

**ADTH Harmone:**

ADTH released in distal convoluted tubule ensures maximum absorption of water.

**Collection of Urine:**

The left filtrate carries only urine and water enters into a collecting duct. Thousands of collecting ducts from all nephrons combine to form open into Pelvis.

(c). **UN BALANCED DIET**

"The diet carrying nutrients in not a proper ratio is known as unbalanced diet."

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# Affects On Life:

An unbalanced diet cause severe problems due to malnutrition or obesity.

1. **Anaemia:**

Anaemia is caused by taking less iron-containing food.

2. **Obesity:**

Obesity may cause due to excess of junk food.

3. **Rickets:**

Rickets may cause due to deficiency of calcium.

4. **Night Blindness:**

The deficiency of Vitamin A causes night blindness and weakening of Retina.

5. **Scurvey:**

The defeciency of Vitamin C causes Scurvey.

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(d)- # CELL WALL

## STRUCTURE:

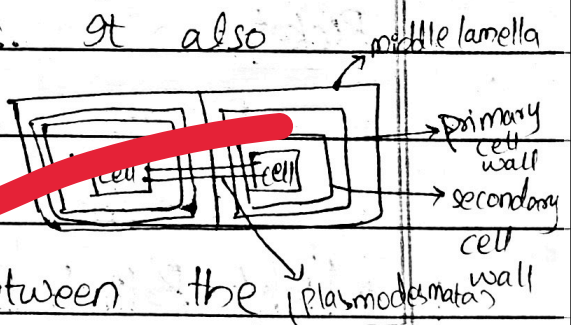
It consists of three walls:

### 1- Primary Cell Wall:

It is living present in (small) every times of plants. It is made up of cellulose.

### 2- Secondary Cell Wall:

It is non-living present only in large trees. It also consists of cellulose.




### 3- Middle lamella:

It is present between the primary walls of two cells and made up of cellulose, hemicellulose and pectin.

### 4- Plasmodesmata:

Plasmodesmata acts as a bridge between two cells and allow movement of materials between them.

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## FUNCTION:

It provides strength, shape and structure and rigidity to a cell.

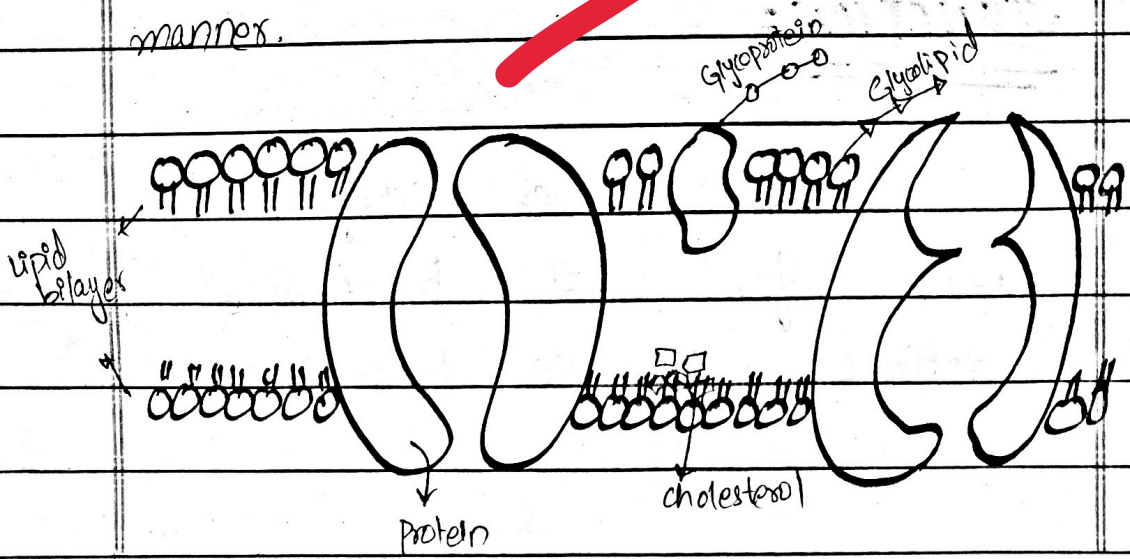
# CELL MEMBRANE

## STRUCTURE:

It's structure is explained by fluid mosaic model.

## FLUID MOSAIC MANNER

The proteins are embedded in a lipid bilayer in a fluid mosaic manner.



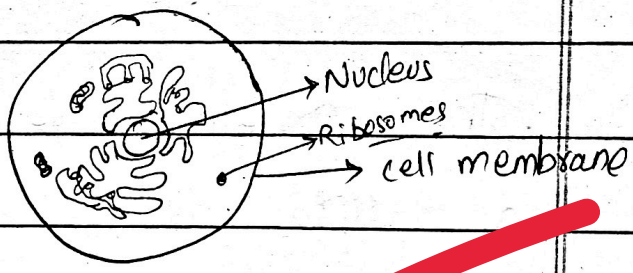
## FUNCTION:

It acts as a semi permeable membrane allow only few materials to pass through it.

# CYTOPLASM

## STRUCTURE:

It consists of cytosol and cytogel. The organelles ATP, RNA are embedded in it.




## FUNCTION:

It provides surface area for all biochemical reactions to take place in.

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# MITOCHONDRIA

## STRUCTURE:

It consists of:

1- **Membrane:**

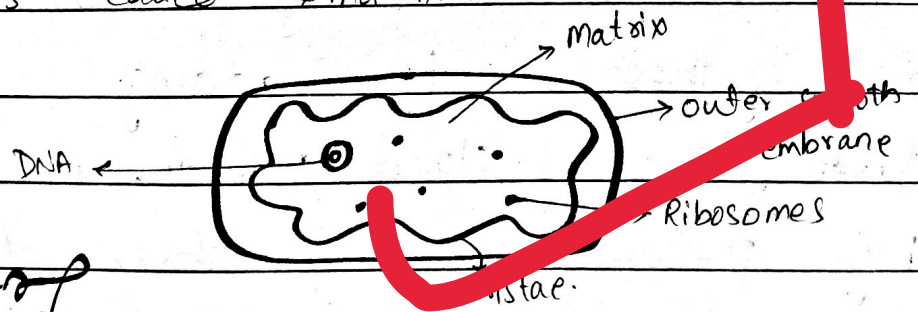
It consists of two membranes

2- **Organelles And DNA:**

It contains ribosomes and circular DNA in it.

3- **Outer & Inner Membrane:**

It consists of outer smooth and inner curved membrane called cristae while fluid inside is called matrix.




## FUNCTION:

It involves in Aerobic respiration and produces ATP. It is also known as power house of a cell.

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# Question Number 05

(b). **Biofuels**

"Biofuels are synthesized from living organisms directly."

## Production Of Biodiesel And Biogas

Biodiesel and biogas can be synthesized by adding litter in a closed cylinder. At high pressure and in absence of air ($O_2$), bacteria decay organic matter and produces biogas and biodiesel.

# (1) Digestive System

"A group of organs (mouth, oesophagus, intestine, stomach) and glands that involve in digestion of food is called digestive system."

## Role of Stomach:

Stomach helps in digestion of protein.

## Role of Pepsin:

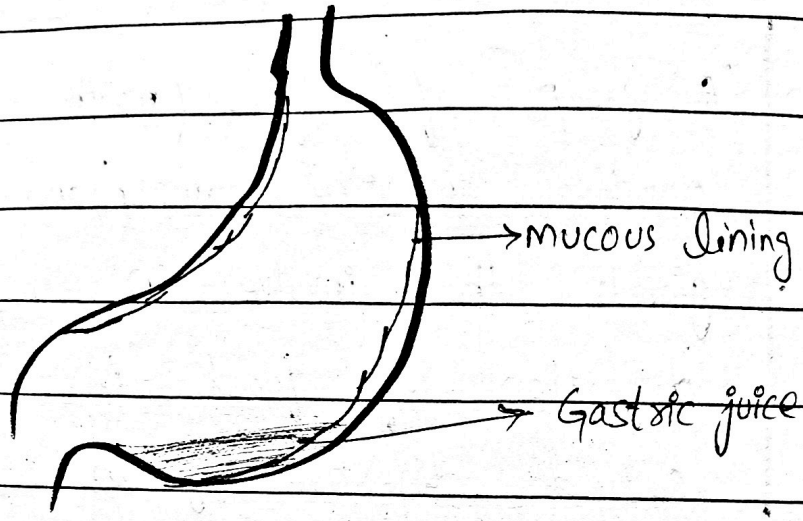
A protein digesting harmone pepsinogen is released in the stomach.

## Role of HCl:

HCl kills the microbes present in food and activate pepsin enzyme (convert pepsinogen into pepsin)

Circular Muscular Membrane of stomach

mixes food with gastric juice by contraction and relaxation.




## ROLE OF INTESTINE (SMALL)

Small intestine consists of
1- Duodenum 2- Jejenium 3- Ilium

### 1- DUODENUM:

It involves the further breakdown of remaining protein, carbohydrate and lipids.

### 2- Jejenium:

It contain enzymes for remaining digestion of food.

### 3- Ileum:

It involves in the absorption

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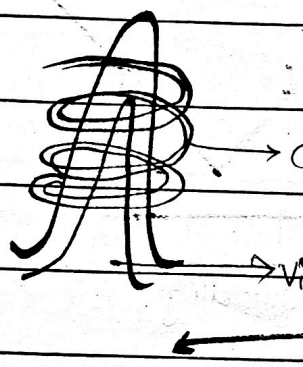
of food.

**Villi:**

It consists of finger like projections called villi which are surrounded by cappillaries for the absorption of food.




## (c) Working Of Optic Fibers

**Total Internal Reflection:**

The working principale of optic fibers is total internal reflection.

**Working:**

The angle of incidence of a ray when greater

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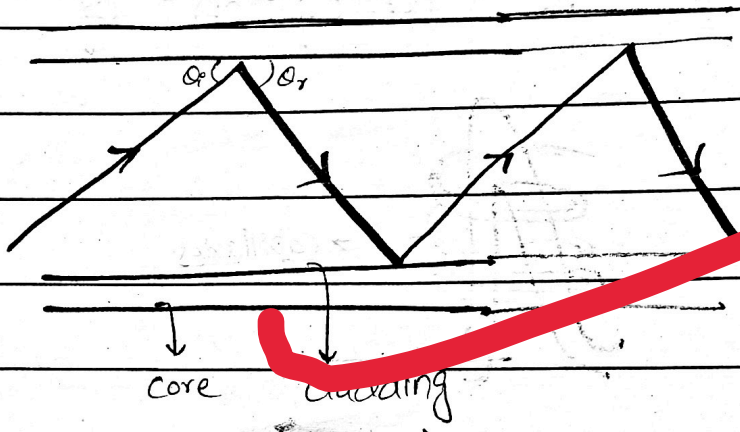
than the critical angle, Some of the rays are absorbed and some are reflected from the cladding.




## Working Of Mobile Phones

Mobile phones consists of receptors, assimilator, sender. A part of mobile phone that sends signals to another phone. The tower recieve signals and send to the reciever of mobile. The mobile then translates the data into language and interpret it.


## (d). Food Additives

Food additives are the substances added to the food to enhance its taste, quality and durability of the food. like food color.

## Food Preservatives

Food preservatives are the substances added to the food to enhance its time of usage like vinegar.

## Food Adulteration

Food adulteration are the

substances that enhance / the ripe the food early like ethene.

## Food Contamination

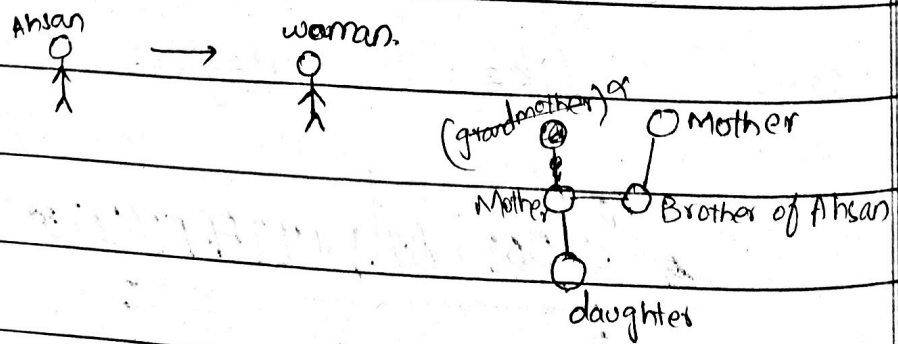
Food contamination are the substances that deteriorate the quality of food like bacteria.

## Section - II

## Question # 06

(A)-

**Given:**

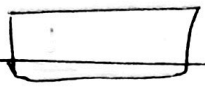



Final Result: Woman is the

mother of Hasan.

(B) Given:

$\frac{l}{w} = \frac{3}{2}$



$V = 12\ km/hr \qquad t = 8\ min.$

**Find:**

Area = ?

**Formula:**

Area = $l \times w$.

**Solution:**

$$V = \frac{12^2 \times 1000\ m}{180\ min}$$

$V = 200\ m/min.$

As $\Rightarrow V = \frac{d}{t}$

boundary - perimeter = $V \times t$

$= 200 \times 8$

$= 1600\ m.$

Perimeter = $2(l + w)$ As $\frac{l}{w} = \frac{3}{2}$

$1600 = 2\left(\frac{3}{2}w + w\right)$ $l = \frac{3}{2}w.$

$1600 = 2\left(\frac{3w + 2w}{2}\right)$

$1600 = 2\left(\frac{5w}{2}\right)$

تاریخ: _____

$$w = \frac{\overset{320}{\cancel{1680}}}{\cancel{5}_1}$$

$$\boxed{w = 320\ m.}$$

$$\frac{L}{w} = \frac{3}{2}$$

$$\frac{L}{320} = \frac{3}{2}$$

$$L = \frac{3}{\cancel{2}_1} \times \overset{160}{\cancel{320}}$$

① 160 × 3 = 480.

$$\boxed{L = 480\ m.}$$

$$\text{Area} = L \times w$$

$$= 320 \times 480$$

$$\boxed{A = 153600\ m^2}$$

$$\text{Area} = \frac{153600\ km^2}{(1000)^2}$$

$$= \frac{153600}{1000000}$$

$$\boxed{\text{Area} = 0.1536\ km^2}$$

c. Given:

T U
x y

$y = x + 2$

$(xy)(x+y) = 144$

find:

Number = ?

Solution:

$(72)(16) = 144$

$y = x + 2$

$((x)(x+2))(x+x+2) = 144$

$(x^2+2x)(2x+2) = 144$

$x^2(2x+2) + 2x(2x+2) = 144$

$2x^3 + 2x^2 + 4x^2 + 4x = 144$

$(2(x^3+)x$

$2x^3 + 6x^2 + 4x = 144$

$2x(x^2 + 3x + 2) = 144$ 72

$x(x^2+3x+2) = 72$

$(x)(x^2+2x+x+2) = 72$

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

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

| $x = 72$ | $x+1 = 72$ | $x+2 = 72$ |
|---|---|---|
| | $x = 71$ | $x = 70$ |

(As, $x$)$^2$

As,

$$(xy)(x+y) = 144$$

For 72,

$$(72y)(72+y) = 144$$

$$x = \frac{7y}{10} = 7$$

As $y = x+2$

$$y = 7+2$$

$$y = 9$$

so, the number is 79

D)-

$x$ , $y$

L.C.M = 48

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

Find: sum of no. = ?

Solution:

| | |
|---|---|
| 2 | 48 |
| 2 | 24 |
| 2 | 12 |
| 2 | 6 |
| 3 | 3 |
| | 1 |

L.C.M = $2 \times 2 \times 2 \times 2 \times 3$

L.C.M = 48

let $x = 2 \times 2 \times 2 \times 2 = 16$

$y = 2 \times 2 \times 2 \times 3 = 24$

تاریخ: _____

sum of numbers

$x + y = 16 + 24$ ①

$= 40$

# Question No. 08-

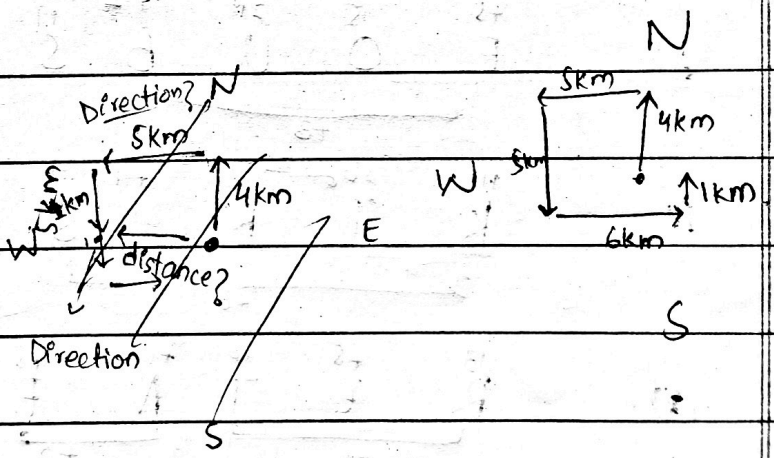
(A)

D B A E C

E C

A is in the middle.

(B)




**Answer:**

Displacement = $-4\,km + 5\,km - 5\,km + 6\,km$

$= 0 + 1\,km$

$= 1\,km.$

تاریخ: _____

Direction While finishing
~~(South)~~ North

Direction after second turn
South

Direction: (From first to start)
West

(C)-

i. T H R S I
20 +8 18 19 +9
+1 applies from 19 to +9; +2 from T to R; +1 from R to S

ii. A O T C
+1 15 20 +3
+5 from 15 to 20; +2 from A to C

iii. E O U B S L
+5 15 21 +2 19 12
+3 from 15 to +3; +3 from E to B; 10; 6; +3

iv. K T R I S
+11 20 +2 18 +2 +9
9; 2; +4; +8

(v)- R E T A E W S
18 +5 20 +5 23 19
+2; 15; 19; +3; 4; 4; +3

kTRIS is odd one.

D-

~~30 triangles~~
32 triangles