

DATE: ___/___/___

GSA (Final Mock)

DAY: ___/___/___

SECTION - B

Q46 (A)

Granddaughter of woman = Daughter of his brother

⇒ Granddaughter is his niece

⇒ Woman (Grandmother) of his niece

= His Mother

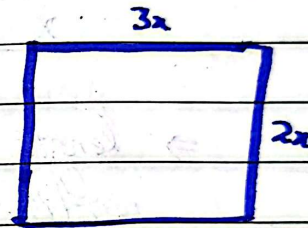
So that woman is either the mother of that man or the mother of his brother's wife.

(B)

Let the sides of the park

length = $3x$

width = $2x$



Speed of cycling in completing 1 round = $\frac{12 \text{ km}}{\text{hr}}$

$$= \frac{12 \times \frac{200}{60} \text{ m}}{1} \text{ min}$$

$$= 200 \text{ m/min}$$

As speed = $\frac{\text{distance}}{\text{time}}$

⇒ distance = speed × time

$$= 200 \frac{\text{m}}{\text{min}} \times 8 \text{ min} \quad (\because t = 8 \text{ min})$$

distance = 1600 m
around the park.

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⇒ Boundary of the park = 1600m

$$\begin{aligned}\text{As perimeter of park} &= 2(l + w) \\ &= 2(3x + 2x) \\ &= 2(5x) \\ &= 10x.\end{aligned}$$

⇒ Perimeter = Boundary of Park.

$$10x = 1600 \text{ m}$$

$$\Rightarrow x = \frac{1600}{10} \text{ m}$$

$$x = 160 \text{ m}$$

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

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

Area of park = length $\times$ width.
(rectangle)

$$= (480 \text{ m})(320 \text{ m})$$

$$\boxed{\text{Area} = 153600 \text{ m}^2}$$

Q6(D)

L.C.M of two numbers = 48

$$\text{Ratio of numbers} = \frac{2}{3} \times \frac{48}{48} = \frac{16}{24}$$

$$= \frac{2 \times 24}{3 \times 1}$$

So the req. no. are = 16 & 24

$$\text{Sum} = 16 + 24 = 40$$

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Q#8

(A)



A is right to B

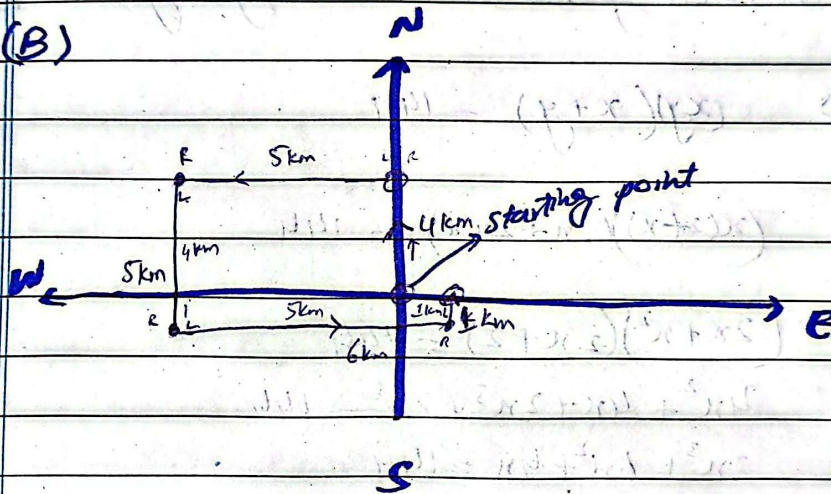
E is left to C

B is right to D

Then "D" is in the middle.

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(B)



i) How many km away from place you started
= 1 km

ii) Which direction you running before finishing
North

iii) After 2nd turn direction
= South

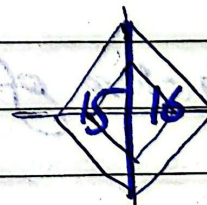
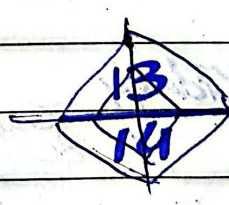
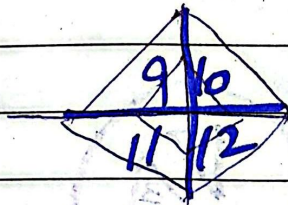
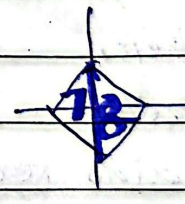
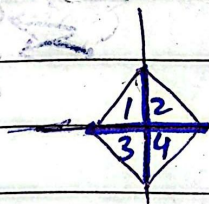
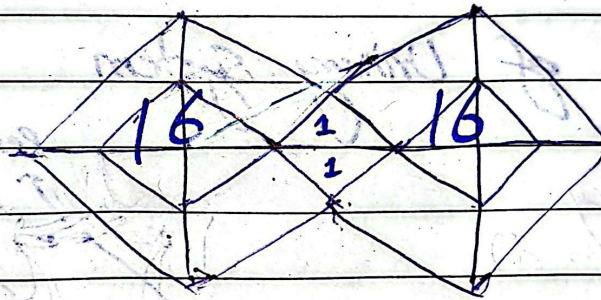
iv) Finishing point to starting point direction
= toward West.

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C. Find odd

- a) THRSI → SHIRT
 b) AOTC → COAT
 c) EOUBSL → BLOUSE
 d) KTRIS → SKIRT → Odd one
 e) RETAEWS → SWEATER

D. Number of triangles



$$\begin{aligned}
 \text{Total no of } \Delta &= 16 + 16 + 2 \\
 &= 32 + 2 \\
 &= 34
 \end{aligned}$$

(Section - A)

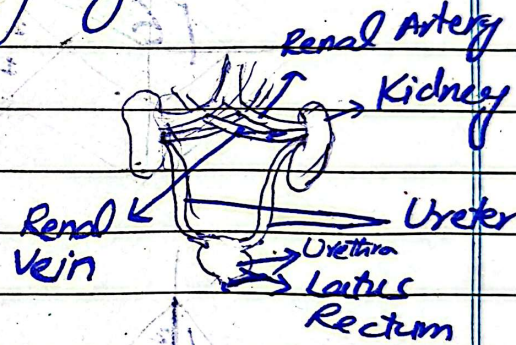
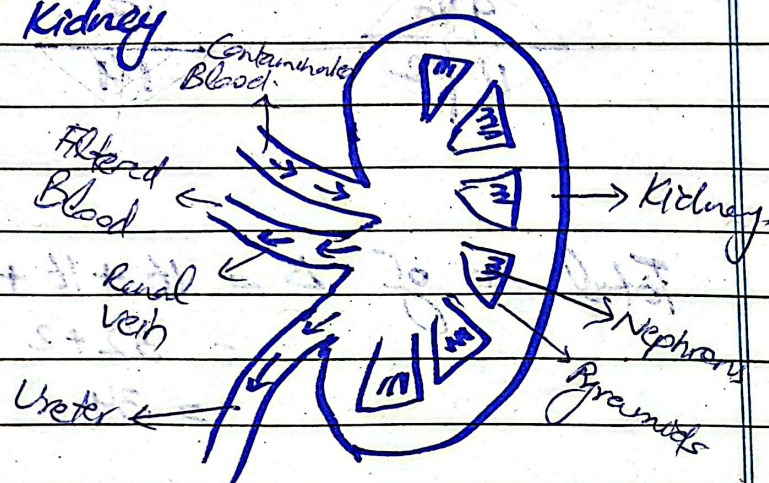
Q#2 (b)

Urinary System

The Urinary system is a system in humans which is responsible for the formation of urine and removes the waste products and harmful substances from the body in the form of urine.

Components of Urinary System

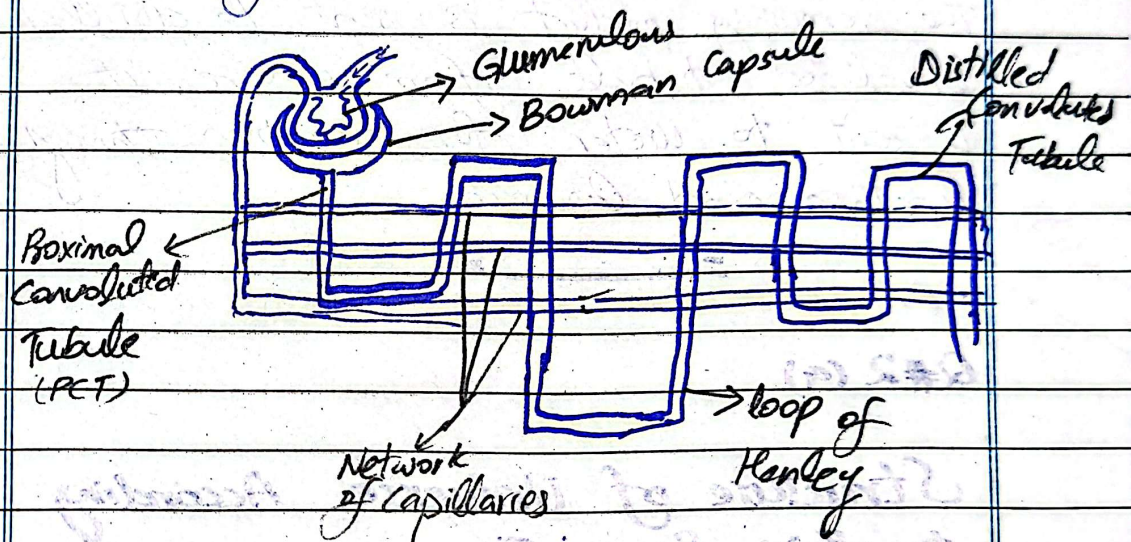
- 1- Renal Artery
(contains blood)
- 2- Kidney (2 Kidneys)
- 3- Ureter
- 4- Urethra
- 5- Latus rectum.

Structure of Kidney

Working of Nephron

Nephron is the central unit of urinary system. There are about **1 Million nephrons** in each kidney. Nephrons perform function in 3-steps.

- 1- Glomerular filtrate
- 2- Reabsorption
- 3- Excretory Function



Structure of Nephron

1) Glomerular Filtrate

The blood is filtered in glomerular and proteins and fats remain in the blood.

This blood is then filtered in Bowman's capsule where other minerals toxins are removed from the blood. This blood is then passed to PCT

② Reabsorption

When the blood passes through PCT, it passes through loop of Henley. There are a number of capillaries present over PCT which reabsorb the essential minerals and mix into the blood stream.

③ Excretion

After reabsorption with capillaries the remaining product is sent to distilled convoluted tubule from where it is sent to ureter for excretion through urethra and out rectum.

Q#2 (a)

Structure of Universe According to Big Bang Theory

According to Big Bang Theory, this universe came into being some 13 billion years ago. The universe known today - in the form of galaxies, solar system, stars, planets and other celestial bodies does not exist in this form rather a hot dense matter existed which then expanded to form universe.

Concept of Singularity

The universe existed in the form of a singularity. A hot and extremely dense matter existed which then exploded and started to expand.

At $t=0$, $s=0$

When time had not started, the universe was extremely hot.

At $t=1$, $s=1$

When time passed a little the universe started expanding and temperature began to fall.

$t=...$, $s=...$ (Quark Formation)

When time further passed the temperature further decreased upto 10000°C and the quarks existed. The structure of universe was in the form of quarks.

$t=\uparrow$, $s=\uparrow$ (Neutrino Formation)

When time further passed the universe further expanded and other nano particles like neutrino came into being.

When $T=10000^\circ\text{C}$ (Protons & Neutrons)

Protons and neutrons formed. Time further passed and universe expanded more.

Nucleus Formation

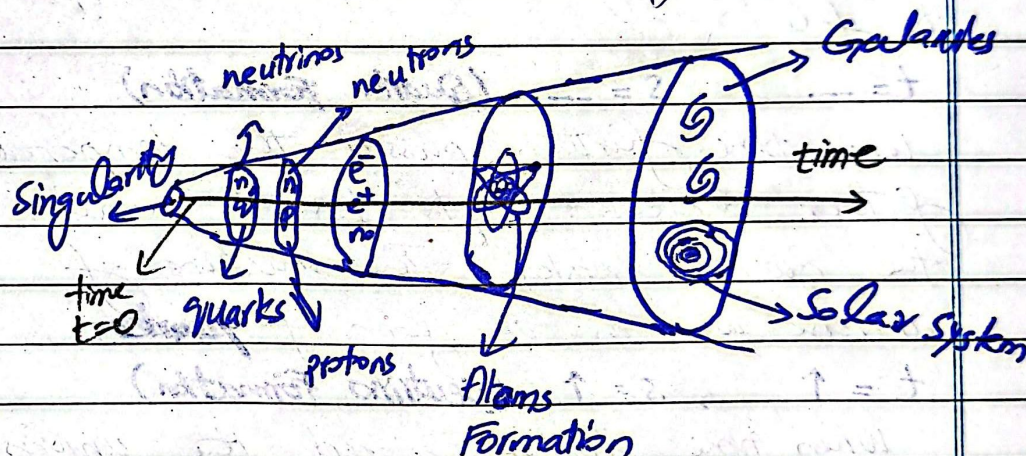
When Temperature further decreased the electrons also formed and basic elements like Hydrogen and Helium came into being.

Nucleus formed and the atom came into existence.



Known Universe Formation

When the universe further cooled down and expansion further increased all other elements known to us came into existence. Then galaxies formed. Solar system came into existence and slowly and gradually universe cooled down to a certain temperature and the universe known to us came into being.



Q#2(c)

Unbalanced Diet

A diet which does not contain vitamins, nutrients, fats, proteins, carbohydrates in proper amounts is called an unbalanced diet.

Effects of Un-balanced Diet

Deficiency or Efficiency of Vitamins

Vit. A → Deficiency of vit A in food ultimately leads to blurry vision, headache

Vit D → Improper intake of vitamin D leads to bone deformation and rickets

Vit E → Deficiency of vitamin E causes skin diseases, Lack of fertility

Vit K → Unbalanced food can also change the balance of vitamin K in the body which is responsible for blood clotting

Vit C → Scurvy, Bleeding gums.

Nutrients Deficiency or Efficiency

Calcium → Bone deformation

Iron → Deficiency of Blood, Weakness, Anaemia

Potassium → Blood clotting issues

Carbs, Fats, ~~Sugar~~ Proteins Imbalance Effects on Health

Carbohydrates → Instant source of energy is not available. Makes ~~thirsty~~ ^{thirsty}. Extra amount of it can lead to diabetes.

Fats → Fats extra amount can clog into arteries and blood vessels leading to angina and heart diseases

Proteins → Proteins necessary for growth and efficient human performance. Its deficiency leads to stunted growth

Q#3

(b) Ceramics

Ceramics is a general term used for non-metallic solids. They are mostly made up of clay under high temperature and pressure. Due to their specific properties they have many applications in industry.

Properties of Ceramics

- i) Ceramics are heat resistant materials,
- ii) Corrosion resistant
- iii) Non-brittle
- iv) Extremely hard
- v) Resistant to bending
- vi) Non-conductor of electricity
- vii) Inert in nature — no chemical reaction
- viii) Cannot be re-moulded
- ix) Can be made electric conductors when Fe_2O_3 (Iron oxide) is present in them.

Applications of Ceramics

Earthenware — The most common application of ceramics is earthen ware. Simplest form of ceramics and is easily breakable due to porous structure.

Stoneware — Stonewares are also an example of ceramics. They are extremely beautiful and expensive than earthenware.

Porcelain — Also known as chinaware as the original technique came from China. They are also known as "Bone China" or "fine bone". These are lightweight and translucent. Extremely beautiful and expensive form of ceramics is porcelain.

Manufacturing Materials — Tiles are the common example of ceramic building materials. Bricks are also ceramics.

Glass and Glasware — Ceramics also include glass and glassware.

Nano-Ceramic Materials — Modern day ceramics are nano-ceramics which are extremely elastic, can also show high toughness and strength depending on the size of particles.

Q# 3(c)

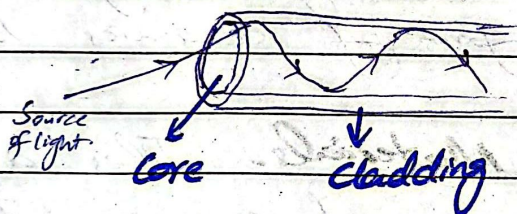
Optic Fibres

Optic fibres are tiny glass strands or plastic strands through which information passes in the form of light wave. These are extremely reliable and efficient to send information over long distances in short time.

Working of Optical Fibre

Optical fibre works on two principles.

- i) Total internal reflection
- ii) continuous refraction



Optical fibre consists of two parts: core and cladding. Light enters into the core through a light source. Core has high refractive index while cladding has low refractive index.

Light that enters into optical fibre works on the principle of total internal reflection and the reflected light is continuously refracted and bending is made smooth to avoid the loss of information. The receiver on the other end then decodes.

this light (information) into electrical signals.

Q3(d)

Food Additives

Food additives are certain compounds that are added into food for different purposes and these additives are further categorized according to the purpose they serve.

For example

- Preservatives — For long availability of food in good form.
- Food colours — For better colour of food this is added.
- Appetizer — To enhance food quality appetizers are added.
- Food Flavors → To further enhance the taste of food certain food flavors are added eg. Strawberry flavor, vanilla flavor, chocolate flavors etc.

- Food Preservatives

Food preservatives are a type of food additive. These are deliberately added to food to preserve the food for a long time and to keep

their texture and taste the same as it was at the time of manufacture.

Food Adulteration

Food adulteration is a term used when something harmful is deliberately added to food which affects the quality or quantity of food. This is done to seek some kind of material gain.

For example

- Addition of water in milk
- Use of Brick powder in Red chillies
- Use of Limestone powder in dry milk etc.

Food Contamination

Food contamination is a term which is used when something harmful is unknowingly added in the food. It can contaminate food at any stage from manufacturing to serving at the table. Its causes can be unhygienic environment or human negligence.

For example - pesticides residues inclusion into food - microbial toxins - chemical residues from packing materials