

SECTION - II

DATE: _____

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Q6- a- FINDING CURRENT AGE OF FATHER:

Solution:

Let the present age of father = x

the present age of son = $y = 30$ yrs

Five years ago

age of father = $x - 5$

" " son = $y - 5$

according to relation defined in question

$$x - 5 = 3(y - 5)$$

$$x - 5 = 3y - 15$$

as $y = 30$; putting value

$$x - 5 = 3(30) - 15$$

$$x - 5 = 90 - 15$$

$$x - 5 = 75$$

$$x = 75 - 5$$

$$x = 70 \text{ yrs.}$$

so,

current age of father is 70 years.

X ——— X

b - Mean of 10, 30, Y , and 50 is 50.

What is value of Y ?

SOLUTION:

Given

$$\text{Mean} = \bar{X} = 50$$

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Number of values = $n = 4$.To Find:Value of $Y = ?$ Solution:

According to formula of Arithmetic mean

$$\text{Mean} = \bar{X} = \frac{\sum X}{n} = \frac{\text{sum of all values}}{\text{no. of values}}$$

$$\bar{X} = \frac{\sum X}{n}$$

$$50 = \frac{10 + 30 + Y + 50}{4}$$

$$50 \times 4 = 10 + 30 + Y + 50$$

$$200 = 90 + Y$$

$$\Rightarrow Y + 90 = 200$$

$$Y = 200 - 90$$

$$Y = 110$$

SO

value of $Y = 110$.

X ————— X

c. Find the missing term.

i. 2, 6, 18, 54, _____, 162

A

Reasoning: Multiplying previous number by

3 gives the next number. i.e

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

ii 3125, 256, 27, 4, 1

Reasoning: every number is a result of exponent equal to that number. i.e

$$1^1 = 1$$

$$2^2 = 4$$

$$3^3 = 27$$

$$4^4 = 256$$

$$5^5 = 3125$$

X ————— Y

d) If the product of two numbers is 320 & their ratio is 1:5. What is the difference between squares of these numbers?

Given:

Let one number be x and other be y

So, product of two numbers = $x \cdot y = 320$

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ratio of 2 no. = $\frac{x}{y} = \frac{1}{5}$

TO FIND:

$$x^2 - y^2 = ?$$

Solution:

eqn 1 = $xy = 320$

equation 2 $\therefore \frac{x}{y} = \frac{1}{5} \quad \text{②} \Rightarrow x = \frac{y}{5}$

putting value of ② in ①

$$\frac{y}{5} \times y = 320$$

$$y^2 = 320 \times 5$$

$$y^2 = 1600 \quad \text{--- ③}$$

From ② it can be deduced.

$$x = \frac{y}{5} \quad \text{or} \quad y = x \times 5 \quad \text{--- ④}$$

putting value of ④ in ①

$$x(x \times 5) = 320$$

$$5x^2 = 320$$

$$x^2 = \frac{320}{5} = 64$$

$$x^2 = 64 \quad \text{--- ⑤}$$

So the difference between squares of these numbers

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$$x^2 - y^2 = 64 - 1600$$

putting eqn (3) & (4)

$$x^2 - y^2 = -1536$$

$$x = \underline{\underline{\quad\quad\quad}} x$$

~~Q8c~~

Q8c. FIND THE NUMBER OF TRIANGLES

The number of triangle in the given figure is 10 i.e.

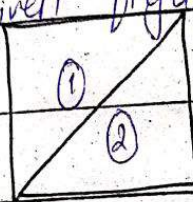
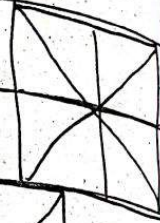


Fig 1

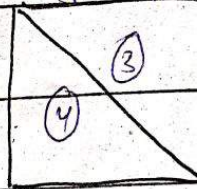


Fig 2

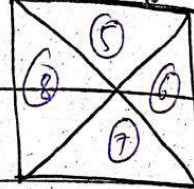


Fig 3

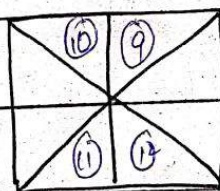


Fig 4

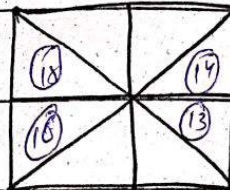


Fig 5

d- Factor which can affect IQ.

IQ known as intelligence Quotient.

was coined by Terman and he also gave formula to calculate i.e.

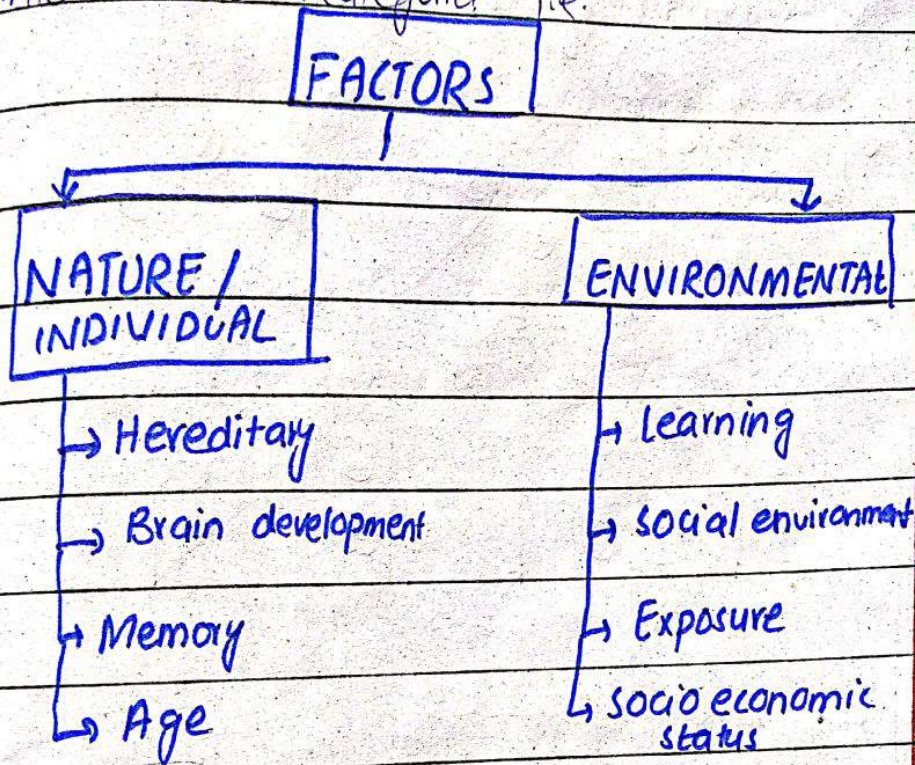
$$IQ = \frac{\text{Mental age}}{\text{Chronological age}} \times 100$$

Generally IQ or intelligence is the ability of reasoning and assesses the ability of an individual to

process information, use logic and give answer or make predictions.

Factors affecting IQ:

Mainly these factors are divided into two categories, i.e.



NATURE:

Hereditary: The genetics of an individual affects his IQ. Mostly a child of intelligent parents tend to inherit his intelligence from parents.

Brain Development: Brain development including growth of its structures and development of neural links also contribute to IQ.

iii. Memory: Usually individuals with strong memory and recalling ability are tend to be possess high IQ.

iv. Age: According to ~~Wattle~~, IQ tends to increase with age upto 25 years and after that it declines towards old age.

→ ENVIRONMENTAL FACTORS: These are

factors present in environment in which an individual lives.

i. Learning: Past experience and learning also contribute to IQ. Those individuals who are exposed to new information and ideas have a significant impact on IQ.

ii. Social environment: social relationship and their understanding contribute to social intelligence while the ability to understand others emotions lay the base of emotional intelligence. All this is learned from a social environment which consists of parents, peers, neighbors, teachers and media.

iii- Exposure: Exposure to high toxins or radioactive materials contribute to the development of brain thus affects IQ

iv- Socio-economic status: Better socio-economic status provides with opportunities and resources to flourish one's IQ. Healthy diet and exposure to new and different learning experiences affect IQ.

X ——— X

b. Finding probability of a pizza slice with raisin.

Total no. of pizza slices = 8

No. of pizza slices containing raisin = 3

Probability of pizza slice with raisin

$$= \frac{3}{8}$$

If Sarah picked a slice of pizza with raisin its probability of being with

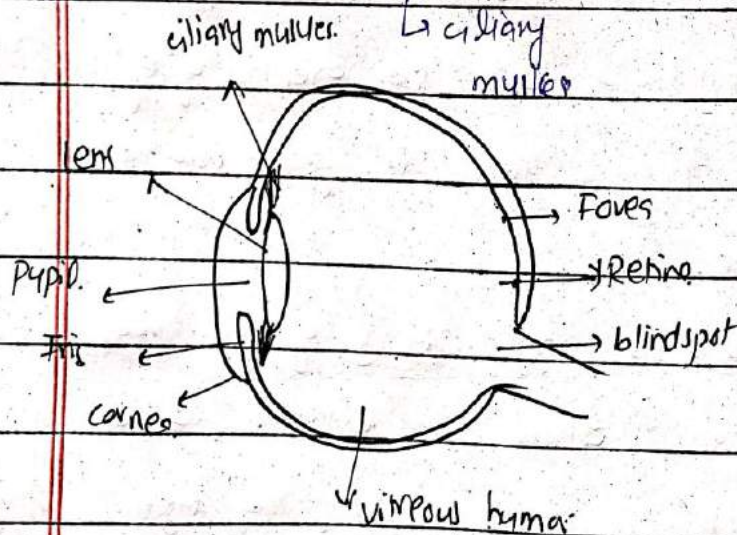
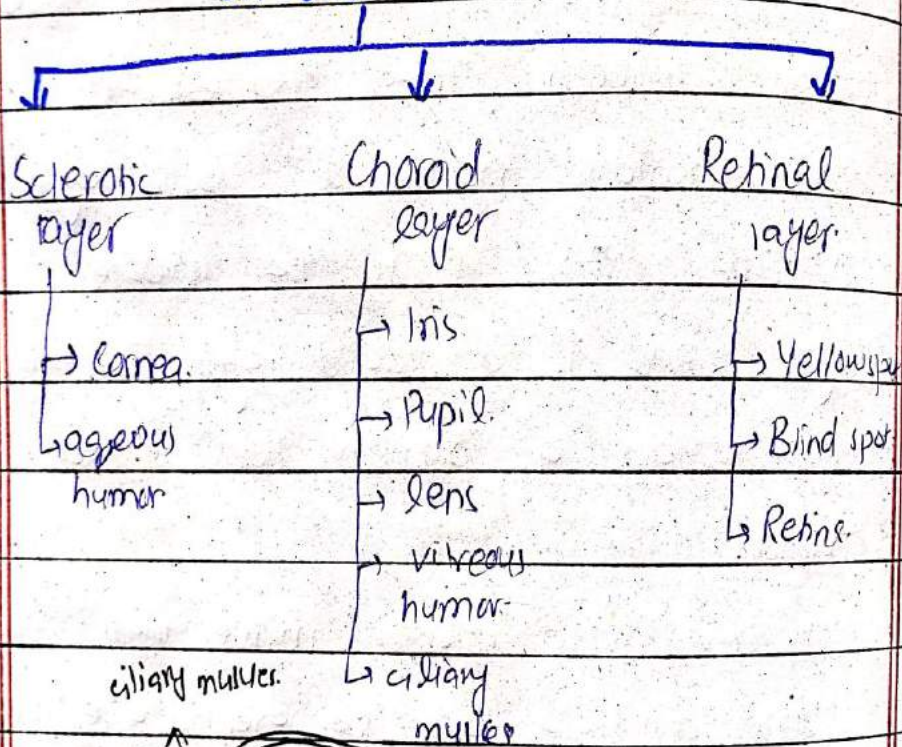
raisin is $\frac{3}{8}$

Q3: Discuss different parts of eye. How far-sightedness and near-sightedness can be corrected.

STRUCTURE OF EYE:

Eye is used for vision and are present in form of a pair with a distance of around 6cm apart.

LAYERS OF EYE



SCHEMATIC COAT:

It is the outer most protective layer of eye. It is transparent in nature.

Cornea: The outer coat is slightly bulged outside which helps in gathering adequate amount of light. This bulged area is called cornea.

Aqueous humour: It is a transparent liquid present between cornea and lens. It helps maintain moisture and nourish eye.

CHOROID COAT: It is the middle layer and is a colored layer because it contains a pigment hence called choroid.

Iris: Iris is a colored muscle that widens and encloses the opening of eye. Its significance is that it gives color to the eye.

Pupil: Pupil is an opening of eye through which light enters the eye. It controls the amount of light entering the eye. It dilates and constricts for this purpose.

c- lens: Human eye contains biconvex lens and it helps in focusing the light on retina to form an image.

d- Vitreous humor: It is an opaque fluid that maintains the shape of eye. It is present between lens and retina.

e- Ciliary muscles: These muscles are attached with lens to elongate and flatten it for establishing its focus.

3- RETINAL COAT: It is the most inner layer of eye and contains photoreceptors i.e. cones and rods. Cones are activated in day light and are used to see and differentiate colors. While rods work better in less light i.e. at night and help in forming shape and location of objects.

a- Fovea: The point of retinal coat enriched with cones is fovea. Image formed here has proper color.

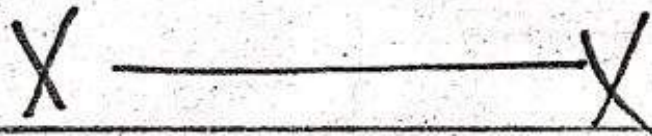
b- Blind spot: The point at which optic nerve leaves the eye is called blind spot.

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because light ~~form~~ falling here form
no image.

c- Retina: If light fall on retina, it will
form image. Rods and cones are
present here.



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Black holes are formed:

Black Holes: It is a cosmic body that has high density and gravity such that even light cannot escape it.

HOW IT IS FORMED: When a star dies, a black hole is formed. When a star has exhausted the internal thermonuclear fuels at its core, that depicts the end of its life. The core becomes unstable and gravitational pull becomes so strong that ^{the star} it pulls itself within its core.

The outer layers of a star are blown away while constituent matter is pulled inward resulting in zero volume and infinite density. This point is called singularity.

X ——— X

What are isotopes, isobars and isotones?

Give examples of isotopes of hydrogen.

ISOTOPES: Isotopes are atoms ^{of same element} having equal atomic number but containing different ^{amount of} neutrons.

Example: Uranium ${}_{92}^{235}\text{U}$ & ${}_{92}^{239}\text{U}$

both atoms have same number of protons but number of neutrons vary.

2- ISOBARS:

Isobars are elements that have same number of nucleons (sum of protons and neutrons)

Example: Isobars of 40 mass number include S, Cl, Ar, K, and Ca.

All of these have same mass number i.e. 40 but atomic number varies, 16, 17, 18, 19, 20 respectively.

3- ISOTONES: Atoms having same neutron number but different ^{proton} atomic number

Example:

Sulphur = ${}_{16}^{36}\text{S}$

Chlorine = ${}_{17}^{37}\text{Cl}$

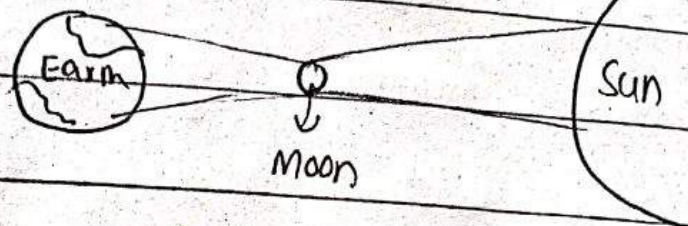
Argon = ${}_{18}^{38}\text{Ar}$ are isotones of 20

a) all contain 20 neutrons



Q4c. Distinguish lunar and solar eclipse.

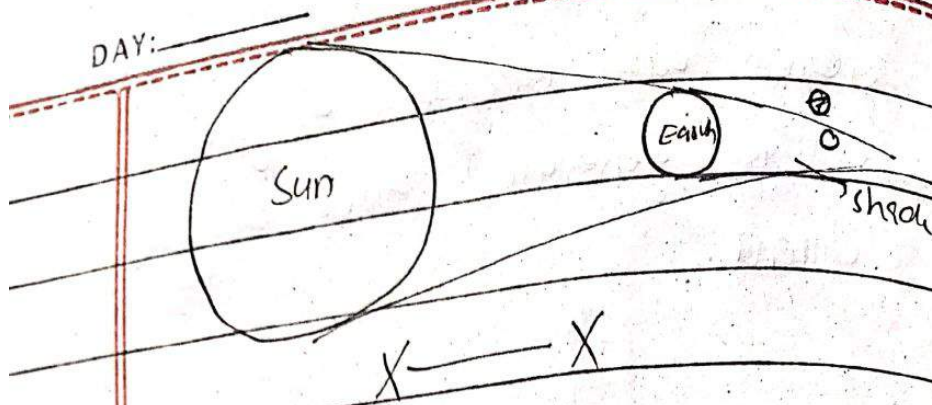
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Both lunar and solar eclipse are cosmic phenomena. In solar eclipse, the moon comes in between the sun and the earth i.e.



The moon casts a shadow on earth and covers a portion of sun.

If it partially covers the sun, it is called partial eclipse and sometimes, an interesting phenomenon called ring of fire happens when ~~sun~~^{moon} completely covers the sun and a ring of ~~light~~ light surrounds the black shadow.

In lunar eclipse, earth comes in between of sun and moon and blocks the ~~reflect~~ image of moon. The earth casts a shadow on moon's surface. i.e.



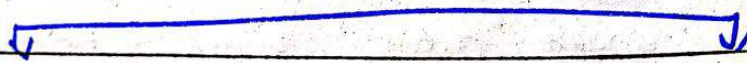
d- What is doping in semiconductor? Discuss different types of ceramic.

Semiconductors do not conduct electricity under normal circumstances unless they

are doped. Doping is a process by which an ~~sem~~ impurity is added into a semiconductor to enhance its electrical conductivity.

Usually, there are two types of doping.

DOPING TYPES



N-TYPE

P-TYPE

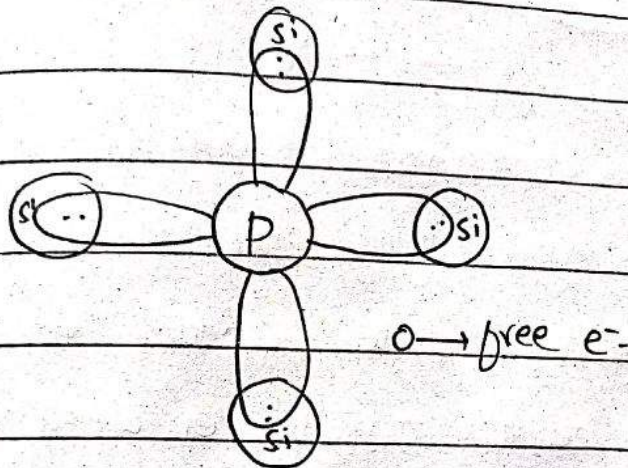
1- N-TYPE

In n-type doping, a pentavalent atom is added to the silicon crystal to enhance its conductivity. Usually phosphorus is used for this purpose. After bonding to

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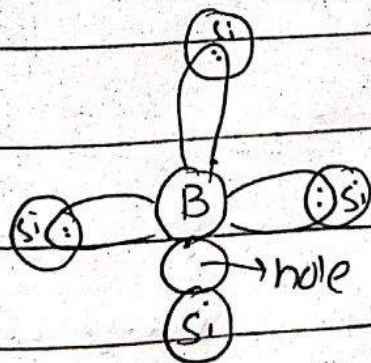
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of silicon outer electron, a free electron is generated which conducts the current..



P-TYPE:

In p-type doping, a trivalent atom like Boron is used as an impurity. The electricity is conducted due to presence of holes which carry ~~negative~~ positive charge and current moves opposite direction to that of electron.



TYPES OF CERAMICS:

Ceramics are non-organic

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non-metallic materials that have been
formed and hardened under high
temperature. It is of different types

i- China ware

ii- Clay or earthenware

iii- Glass ware

iv- Porcelain

v- Stone ware

X = = = X