

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

Q2

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.

a. What is Big Bang Theory?

(1) BIG BANG THEORY:

1. For a 5-mark part, aim to write at least 2 and at most 3 sides of the answer sheet.

Big Bang Theory proposes the idea of a singularity within which the entire matter and non-matter was condensed, millions and billions of years ago. The singularity due to extremely high energy caused a huge blast creating the universe that we know of today.

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.

Singularity

3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.

Big Bang (blast)

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.

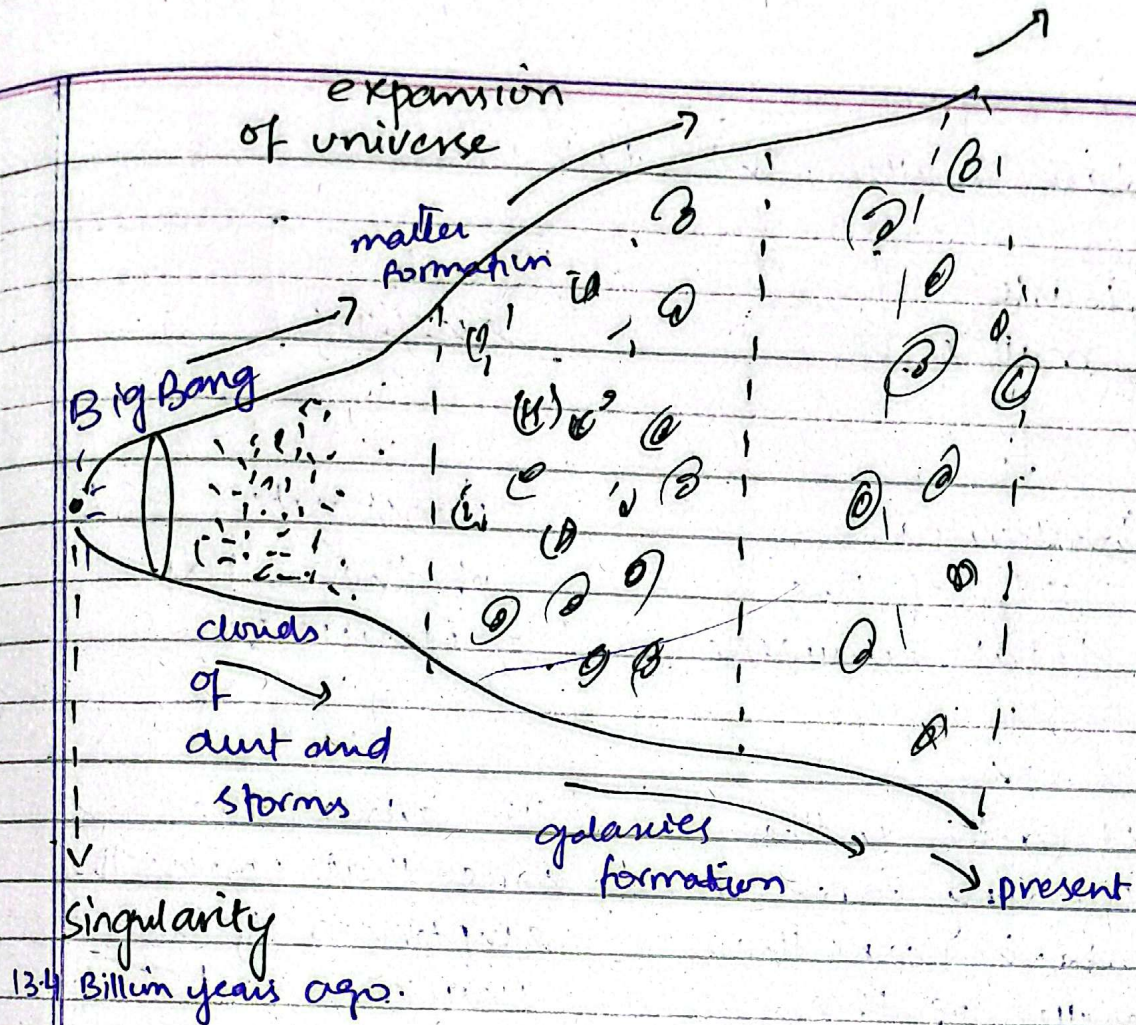
formation of neutrons and protons

6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

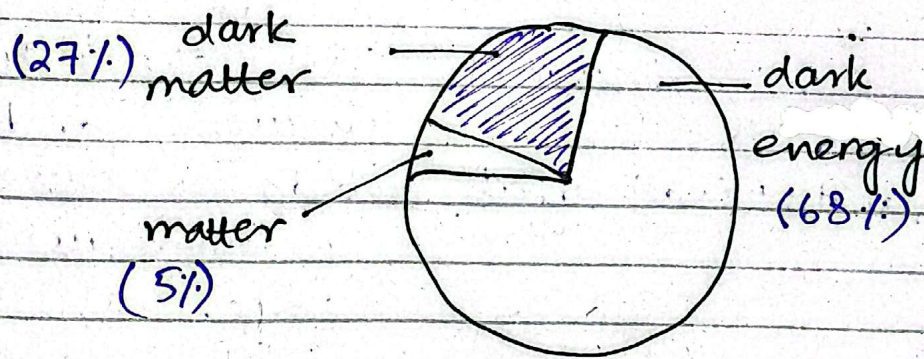
fusion of electrons with atoms to stabilize

Hydrogen and Helium gases

Good luck for CS5 2026 — you're going to ace it, in sha Allah! ★



(2) DARK MATTER AND DARK ENERGY:



The matter, consisting of galaxies and stars, constitutes only 5% of the entire universe. The rest percentage is divided between

dark matter and dark energy.

Dark
matter



Constitutes
27% of the
total universe



It acts as the
binding force
which keeps the
matter of the
universe together.



It is only observed
due to its
gravitational effect.

Dark
energy



Constitutes 68%
of the total
universe



It acts as the
force that causes the
expansion of the
universe and
accelerates the
expansion of uni-
verse.



Covers the entire
universe and
tends to have
a repulsive
force

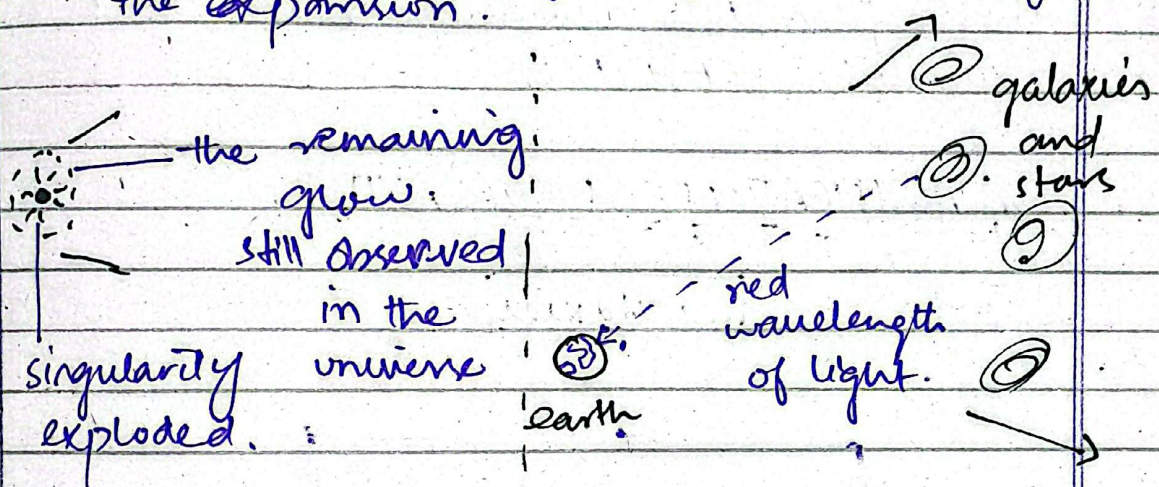
In short, it can be said that
dark matter keeps the matter in universe,
forming galaxies, intact through its
gravitational force. Whereas, dark

energy out as the repulsive force,
accelerating the expansion of universe.

(3) KEY EVIDENCES SUPPORTING BIG BANG...

Mainly two evidences are presented;

- (a) Presence of an explosion glow.
- (b) Red light wavelength of stars hinting the expansion.



distant stars → red wavelength
nearer stars → blue wavelength.

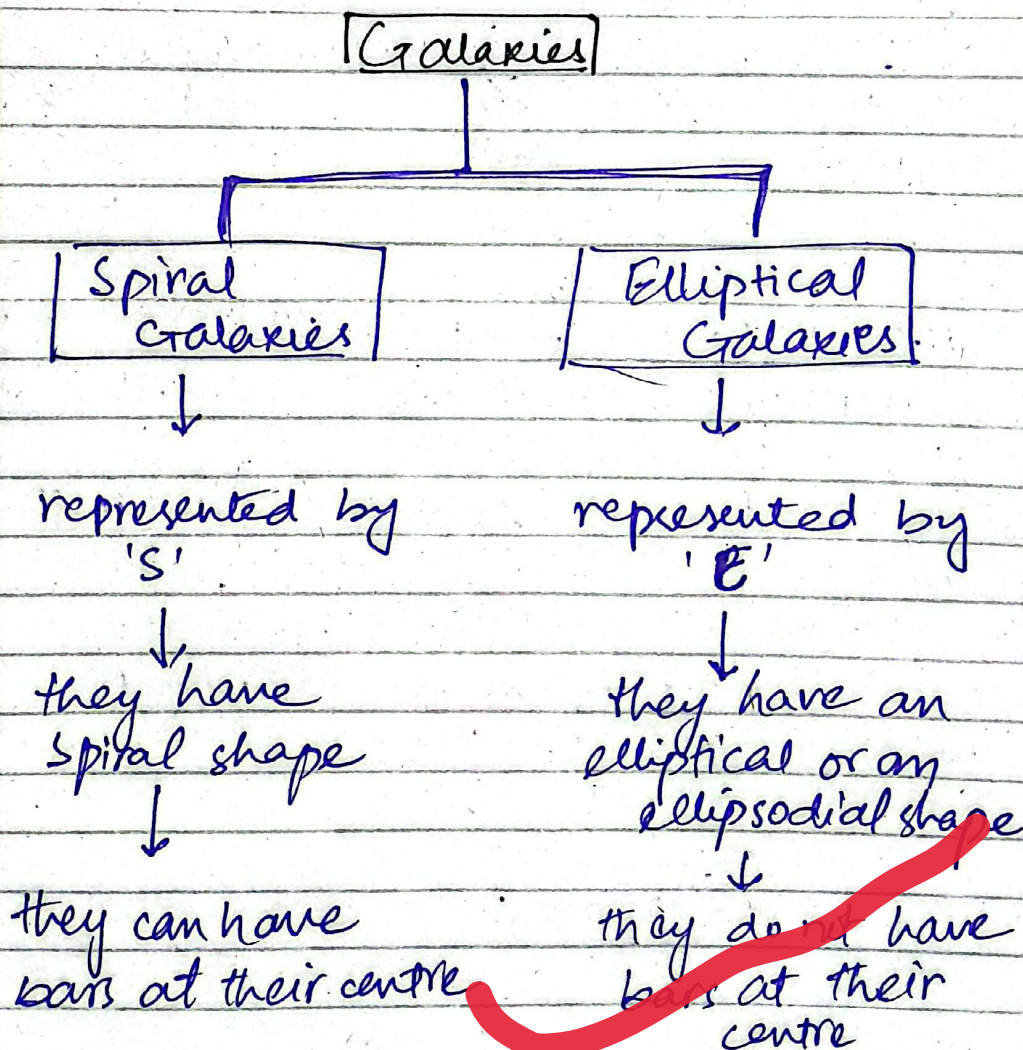
The observed stars have red wavelength of light more than the stars with blue wavelength. This supports the idea that universe is constantly expanding.

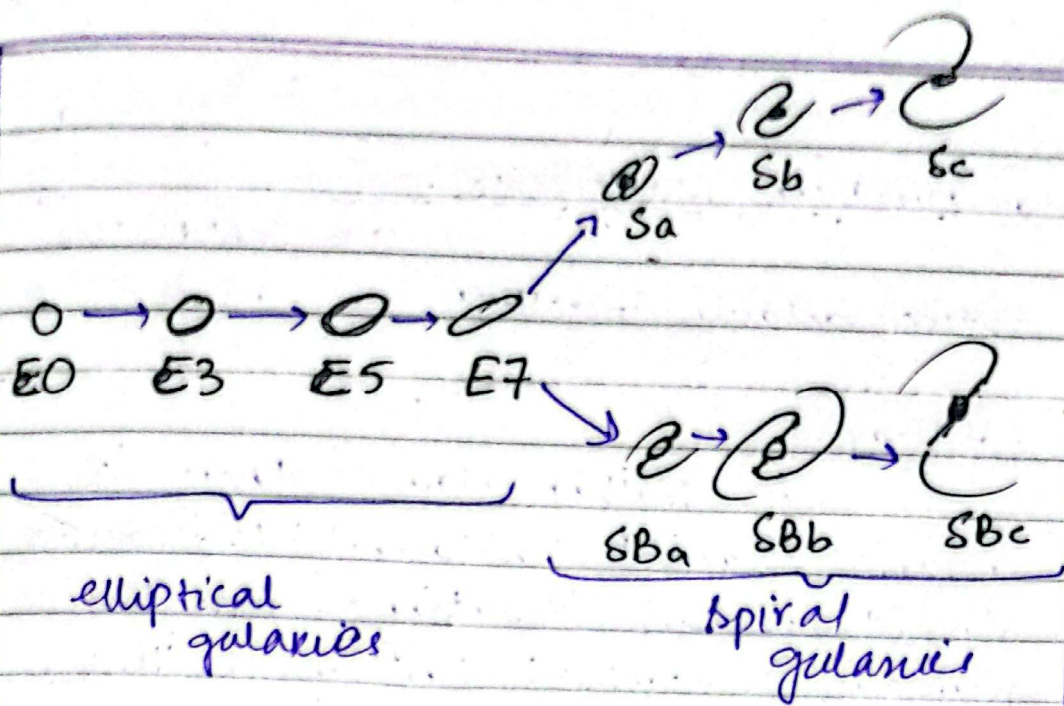
(b) What is a galaxy --

(1) GALAXY:

A galaxy is a gravitationally bound body consisting of a black hole at its centre, along with dust, nebulae, asteroids, meteoroids, solar systems, stars, planets, dwarf planets and natural satellites.

(2) CLASSIFICATION OF GALAXIES:

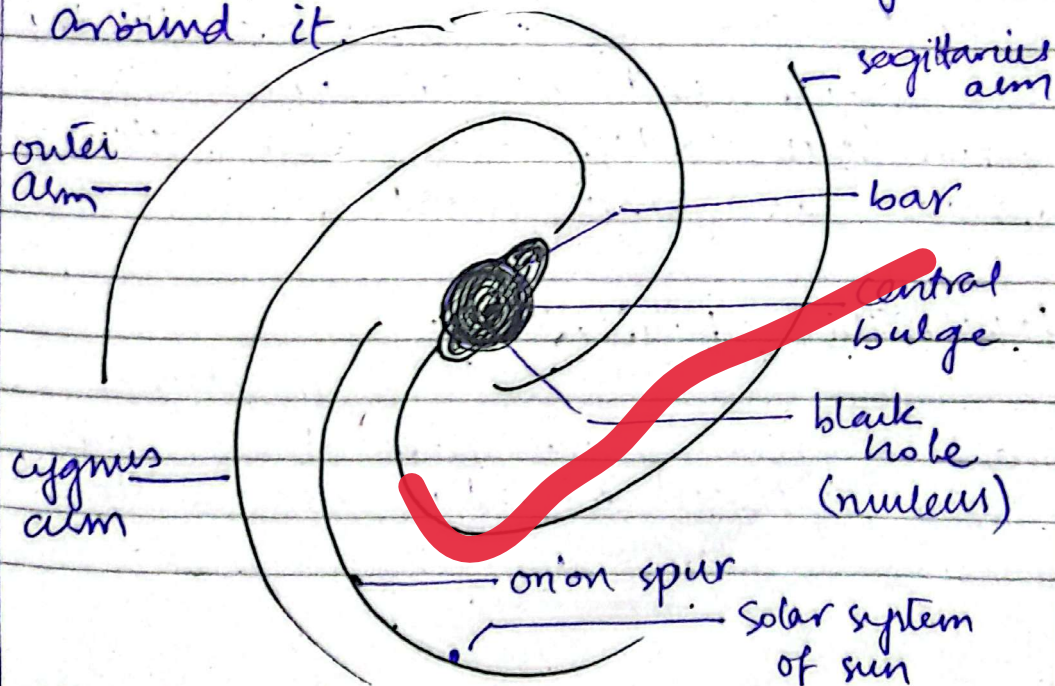




(3) MILKY WAY GALAXY

• (a) Structure of Milky Way Galaxy.

Milky Way Galaxy is the home of our solar system. It consists of a central bar consisting of a black hole, with arms circulating around it.



(a) Nucleus / black hole.

It holds the entire galaxy together.

(b) Bar:

As Milky way galaxy is a spiral barred galaxy, the arms do not emerge directly from the nucleus or central bulge, rather from the bar.

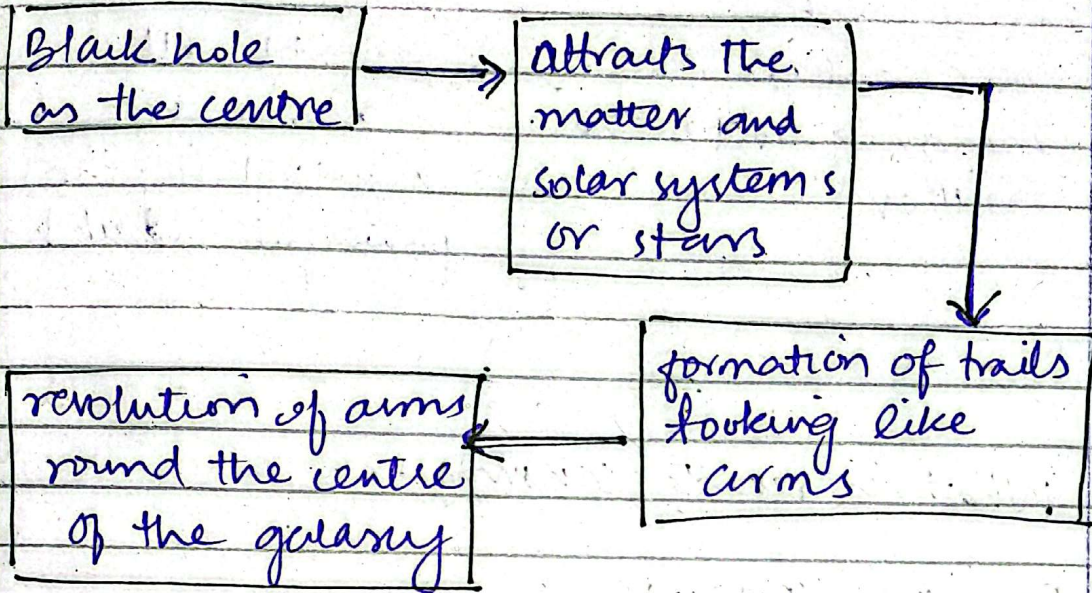
(c) Arms:

The arms are the trails of dust particles, nebulae, solar systems, planets, asteroids and meteoroids forming an arm shape, circulating or revolving round the centre of the galaxy due to its strong gravitational pull. They are divided into major and minor arms. The Orion Spur contains the solar system where our planet resides.

(4) FORMATION OF GALAXIES:

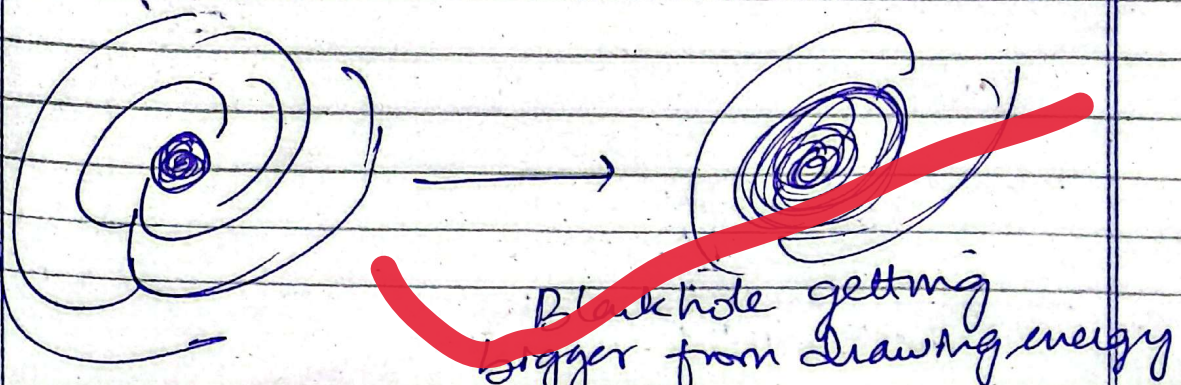
Formation of galaxies begin from the black hole, whose gravitational pull

attracts the matter to itself. Gradually, the matter builds up, getting closer and begins revolving around it, creating the galaxy.



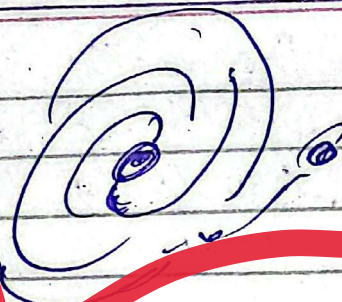
15) EVOLUTION OF GALAXIES:

The black hole at the centre keeps on attracting the arms, or the material, into itself until they completely vanish. The galaxies may also form a hybrid, drawing energy from each other until one completely takes over the other.





one galaxy
merging into the
other



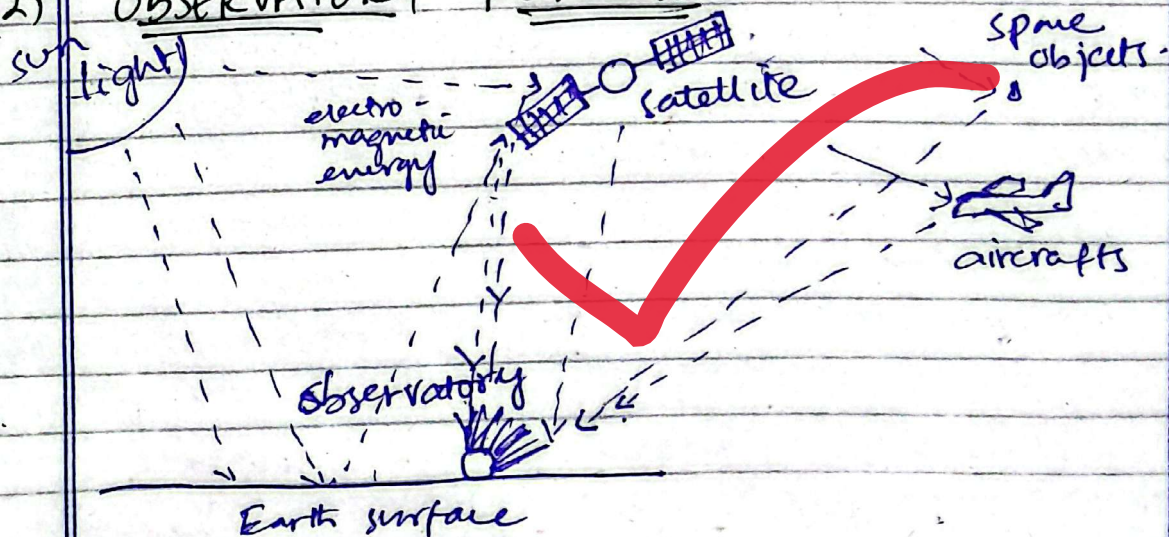
until all
arms are
engulfed by the
powerful black hole.

(C) What is remote sensing ---

(1) REMOTE SENSING

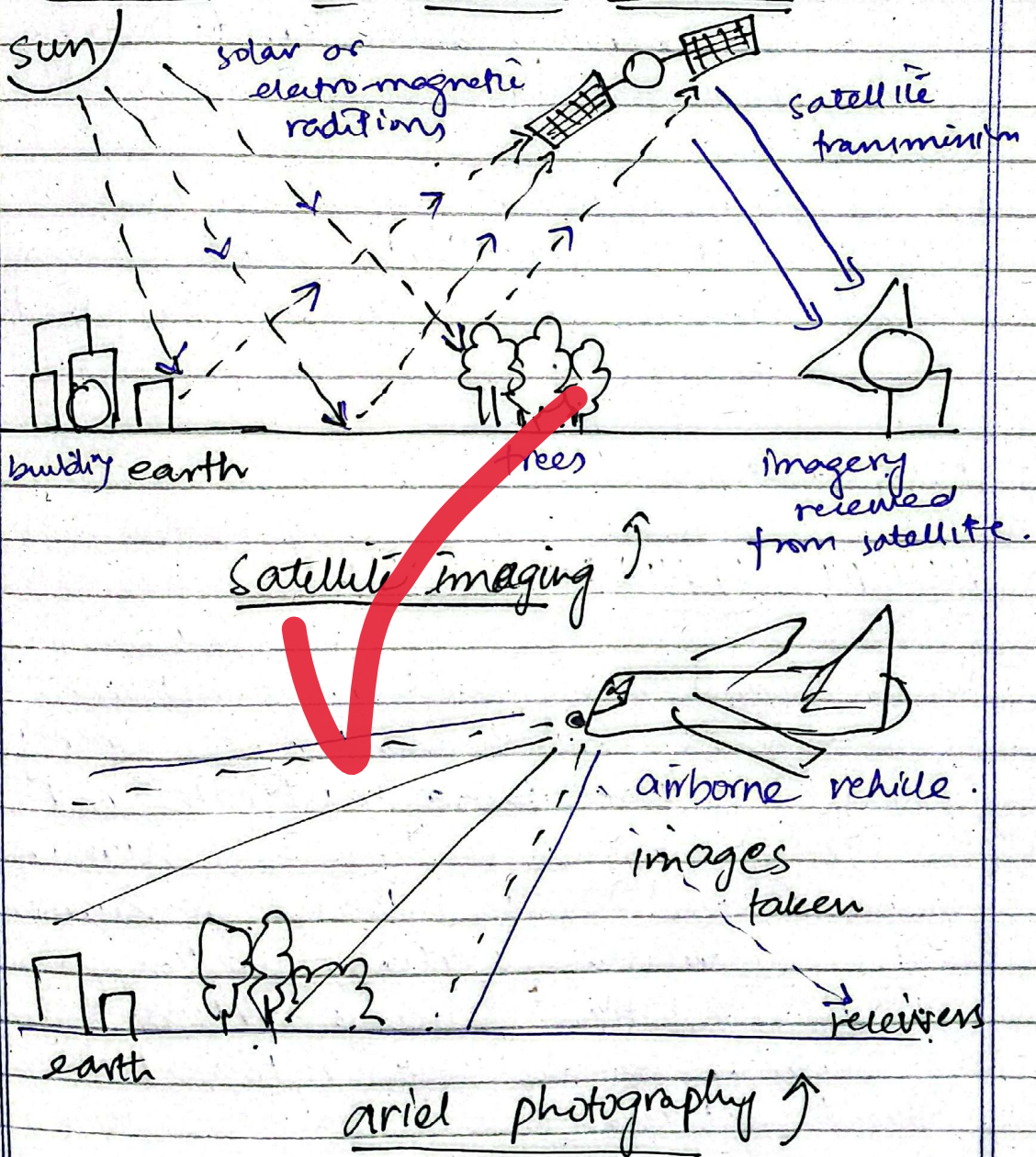
Remote sensing
is a system of locating, sensing
and analysing the environment
or a particular object in a wide
area.

(2) OBSERVATORY FUNCTIONS :



The observatories use the technology of sensing and receiving the light from the object the reflected electro magnetic energy from the sun. It is received and the image is generated by using it.

(3) APPLICATIONS OF REMOTE SENSING



(4) MONITORING NATURAL DISASTERS AND ENVIRONMENT

(a) Aerial photographs and videos can help analyse the situation without physical presence in that area.

(b) The changing environmental conditions can be received beforehand through the shift in radiation reception.

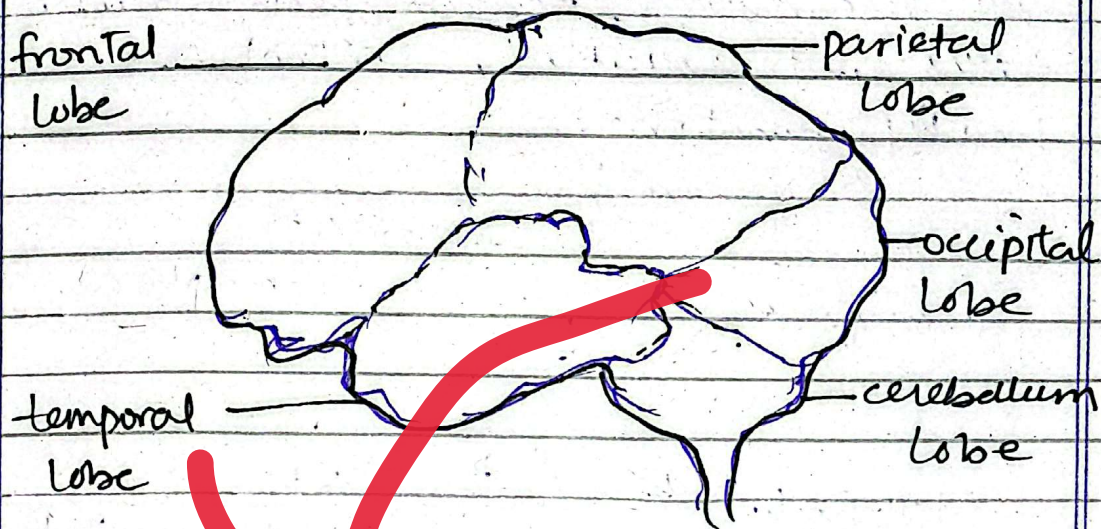
(c) The remote sensing technology can help send the affected areas images to analyze if a damage has happened.

(d) Main functions ...

(1) HUMAN BRAIN FUNCTIONS:

Human brain controls the bodily functions of movement control, thinking, memory storing, breathing, blood heart rate and the emotions of the body. The human brain is the control house of human body, ensuring effective working and regulating various actions of human body, both internal and external.

(2) REGIONS OF HUMAN BRAIN:



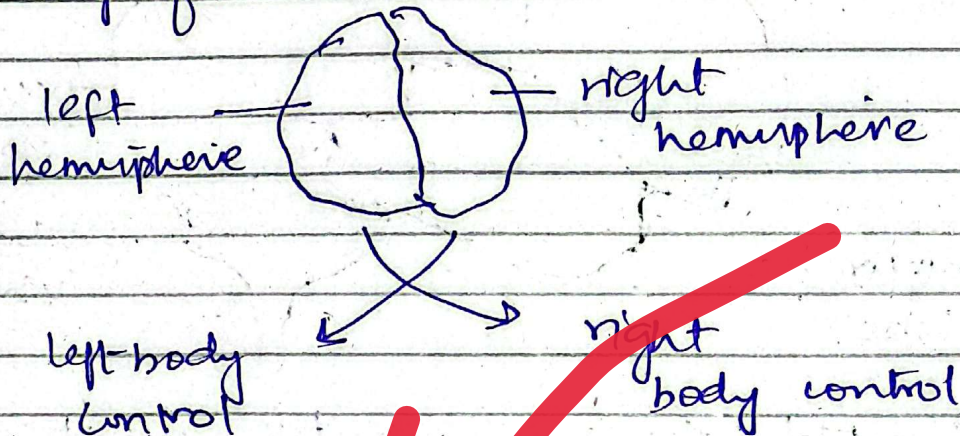
Frontal Lobe → cognitive functions
↳ personality, behavior
↳ problem solving skills
↳ reasoning

Parietal Lobe → sensory information
(pain, temperature, touch)
→ spatial awareness

Temporal Lobe → hearing functions
↳ understanding
↳ language
↳ processing emotions

Occipital Lobe → visual information and processes
↳ recognizing shapes and colors

All these regions perform their specific tasks and collectively control the bodily functions.



(3) FACTORS AFFECTING BRAIN FUNCTIONS

(a) Sleep → disturbs the body's inbuilt clock system.

↳ It affects the time of bodily function which further disturbs the brain's normal working.

(b) Stress → Stress can cause hormonal imbalance in the body which in return disturbs the brain function that depends on the hormonal balance.

(d) nutrition → each body part requires nutrients to function effectively. The deficiency of the necessary nutrients is like cutting off the fuel of car engine. Once the supply is reduced or completely cut off, the ~~and~~ brain functions are affected.

Q4.

FIBER OPTICS:

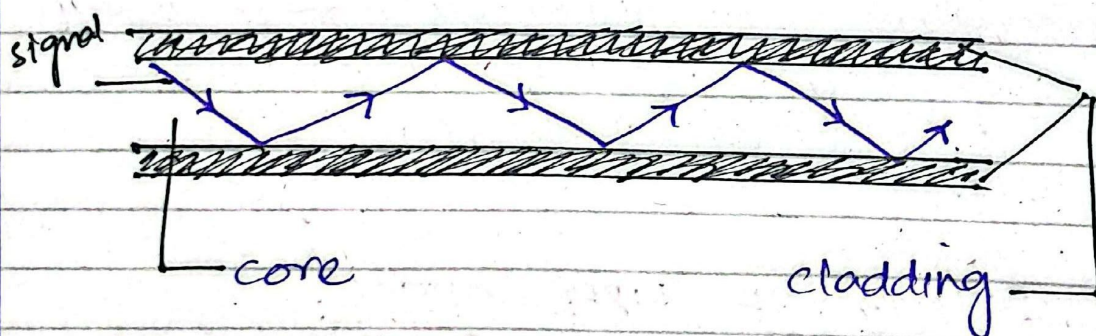
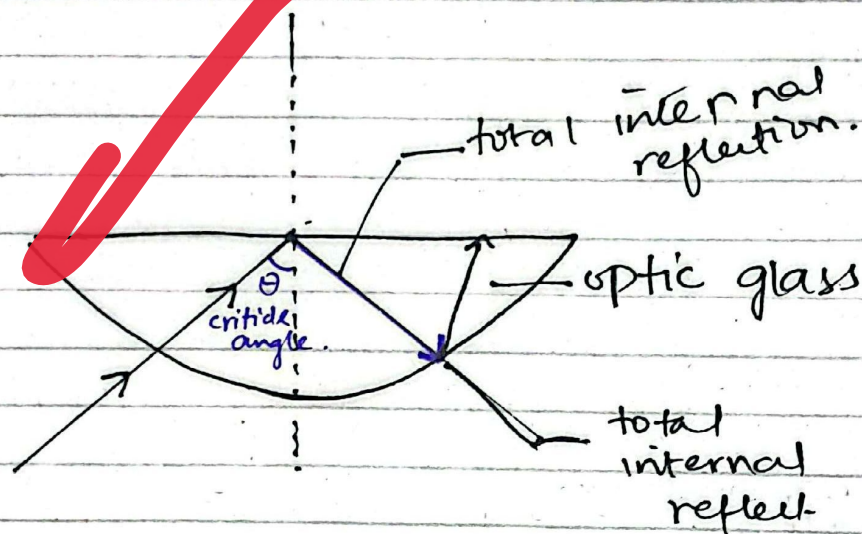
Fiber optics are optically thin glass, as thin as hair, which are used to transfer digital information over long distances.

WORKING OF FIBER OPTICS:

Fiber optics transfer digital data through use of total internal reflection.

⇒ Total Internal Reflection:

Total internal reflection takes place when the angle of incidence exceeds critical angle and completely reflects inwards.



signal travelling through optical fiber through total internal reflection.

⇒ ADVANTAGES OF FIBER OPTICS OVER TRADITIONAL COPPER WIRES

(a) Thin structure:

A thin fiber cable allows enormous amount of information to be transferred effectively.

(b) Limited loss of data:

Use of fiber optics allow little loss of energy over long distances.

(c) Immune to interference:

These means of data transfer don't allow loss of information due to external interferences like sound, heat or other factors.

(d) More data transfer in less time:

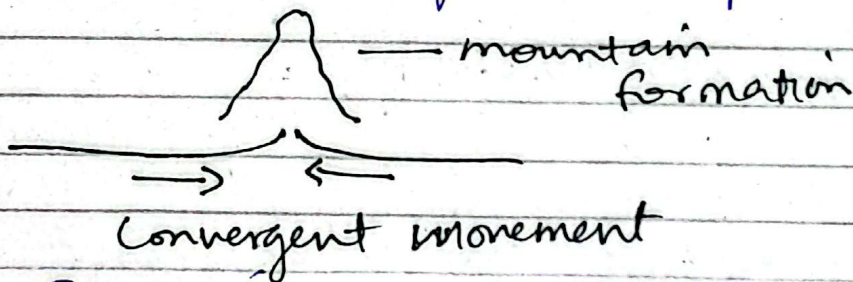
It effectively transfers a lot of digital information in less time with almost no data loss.

(b) CAUSES OF EARTHQUAKES

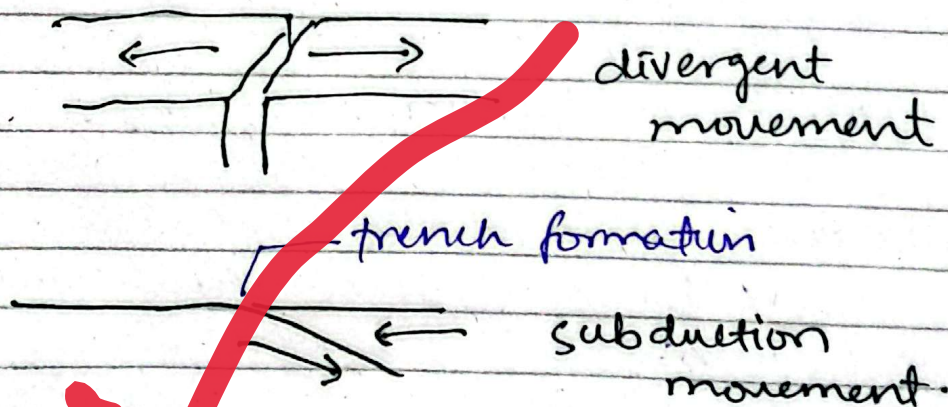
- (i) The movement of tectonic plates
- (ii) The rebounding of elastic energy stored in the earth's crust due to prolonged stress over earth's crust.

EFFECTS OF EARTHQUAKES:

- (i) Relocation of tectonic plates



- (ii) Formation of mountains



- (iii) Damage to the infrastructure

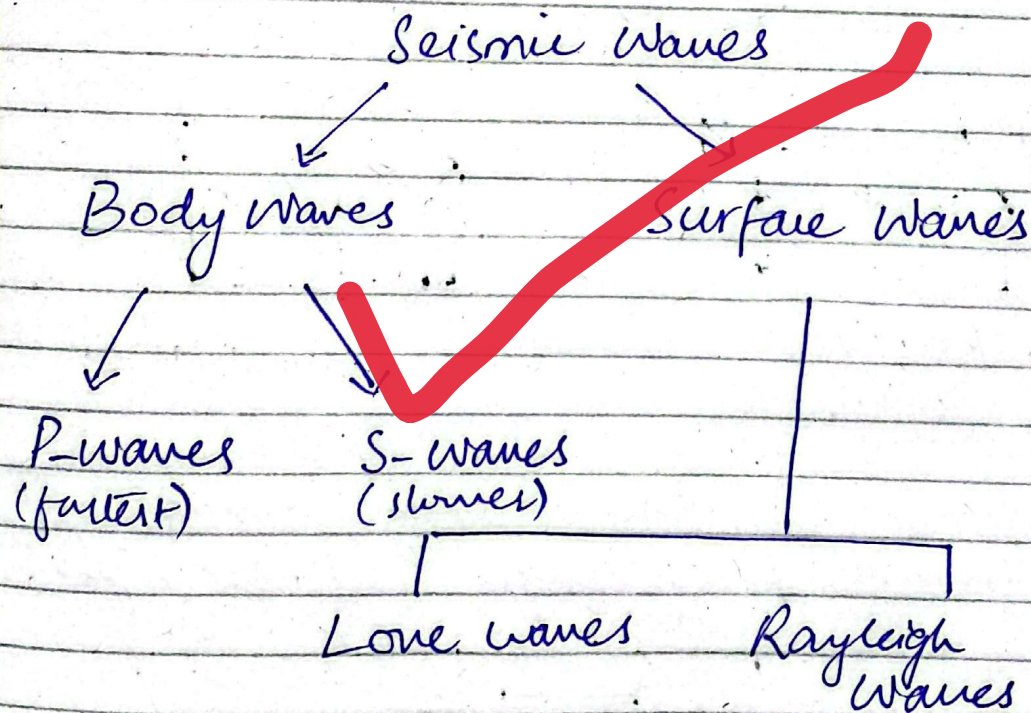
(iv) Trenches in oceanic beds are formed leading to tsunami

(v) Mountain ranges are formed as a result of convergent movement

(vi) Agricultural area is lost

(vii) Casualties and injuries to human beings and other life on earth

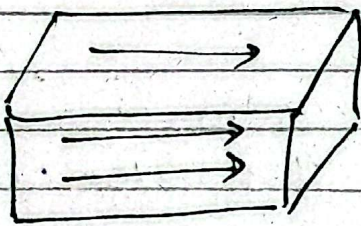
TYPES OF SEISMIC WAVES



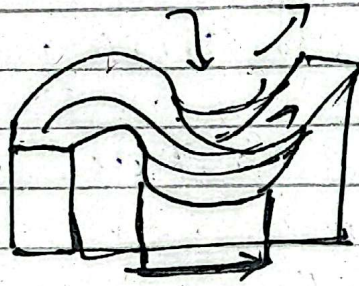
Body waves → travel through earth's interior

Surface waves → travel through earth's upper surface

Body waves

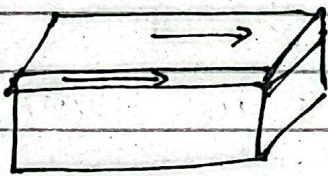


P-waves

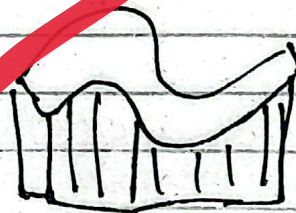


S-waves

Surface waves

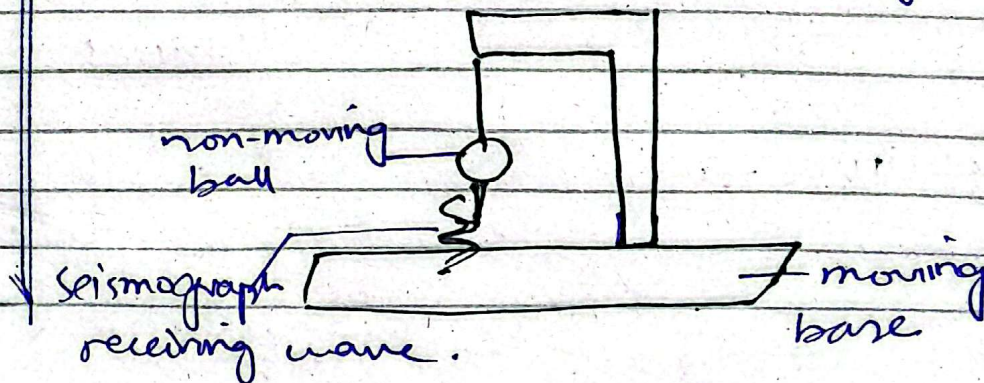


Rayleigh wave



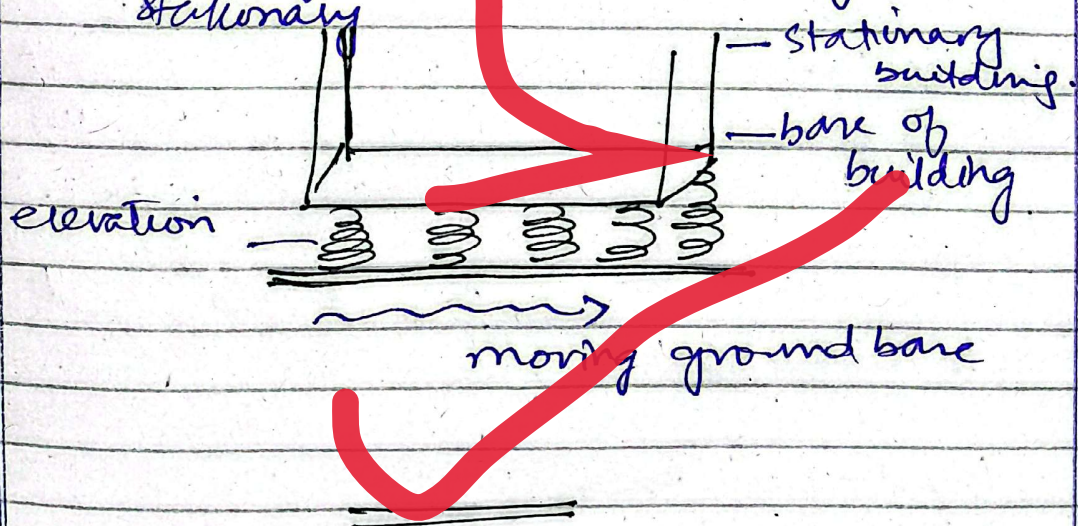
Love wave.

Seismic waves are measured through "seismograph".



EARTHQUAKE RESISTANCE

- (a) Flexible infrastructure allows the earthquake waves to travel through them, but do not collapse under a compact, immovable structure.
- (b) An inbuilt seismograph inside a building allows the wave energy to move the heavy ball in the top most part of the building, protecting the structure of the building.
- (c) If the base of the building is elevated from the ground, the seismic waves do not affect the building, rather keep the body stationary.



(C) BALANCED DIET:

Balanced diet consists of all the important carbohydrates, proteins, fats, nutrients, minerals, vitamins etc in a balanced amount.

The three major sources of energy in our diet are as follows in a balanced amount.

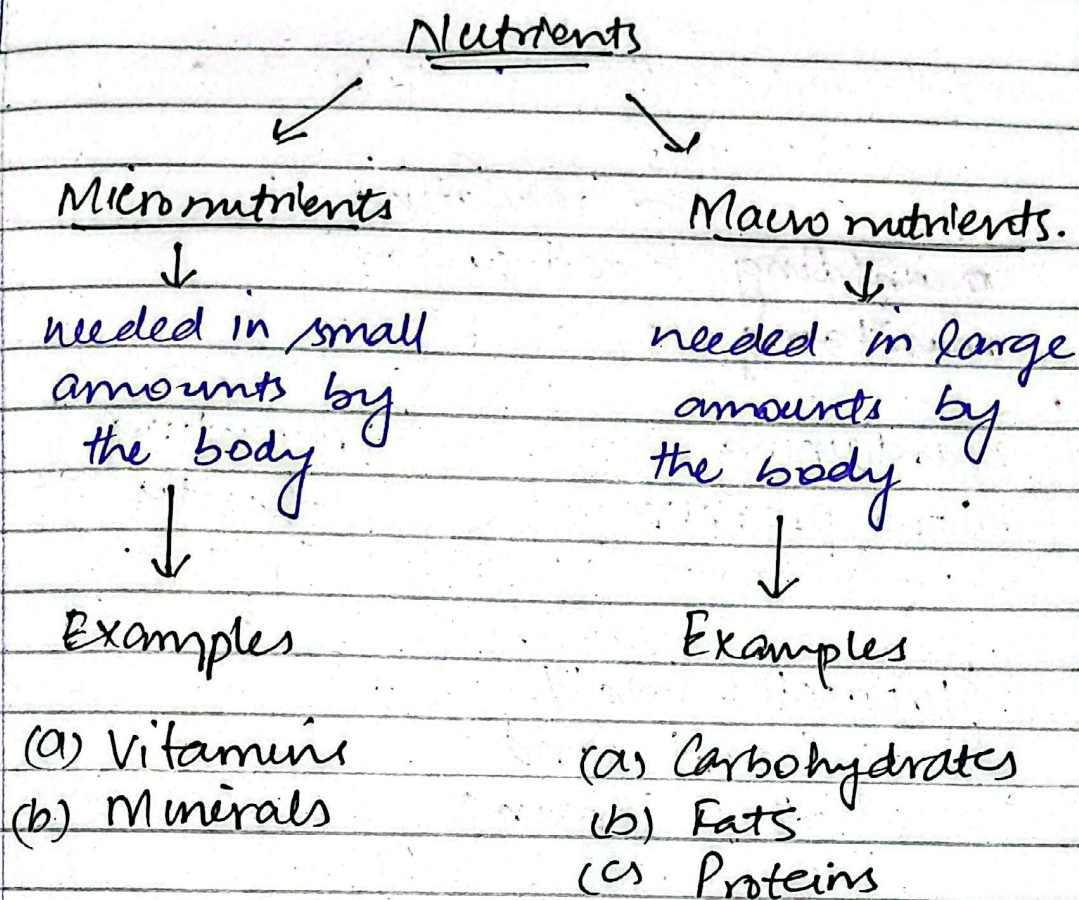
Carbohydrates	— 58%.
Fats	— 30%.
Proteins	— 12%.

NUTRIENTS:

Nutrients are ~~very~~ important sources of energy that are required for proper functions of body, to move and for reproduction.

They are classified into two categories.

- (1) Macro-nutrients
- (2) Micro nutrients



The micro nutrients are taken in smaller amounts because ~~they~~ the excessive intake can lead to toxicity increase in the body.

PREVENTION OF CHRONIC DISEASES

A balanced intake of,

- (a) carbohydrates
- (b) fats
- (c) proteins
- (d) minerals
- (e) vitamins
- (f) water
- (g) nutrients

lead to a healthy lifestyle.

It helps in;

regulating
blood sugar

maintaining
blood pressure

preventing
obesity

promotes health
of heart and
other organs

prevents
toxin buildup

All these outcomes help in leading
a healthy life and prevents
contracting a life threatening
disease or chronic diseases.

(a) SOURCES OF WATER POLLUTION:

Definition:

The contamination of water bodies through pollutants is called water pollution. It includes the pollution of lakes, rivers, sea, ocean and underground water bodies.

Sources

- (i) Unfiltered industrial waste
- (ii) Leakage and seepage of polluted water into the underground
- (iii) Human activities polluting rainwater that ultimately dumps in water bodies.
- (iv) Agricultural waste containing insecticides, pesticides and fertilisers
- (v) Acid rain and flood water containing wreckage and pollutants.

EFFECTS OF WATER POLLUTION:

(i) Effect on human body:

→ Drinking polluted water causes water borne diseases like cholera.

→ Can act as a vector for spreading of plague

(ii) Effects on marine life:

→ The aquatic life is affected badly due to toxins or other pollutants in water.

→ Death of aquatic life and harm to their bodily functions

→ Aquatic plants also suffer due to pollutant presence.

(iii) Effects on environment:

→ It degrades the water quality and can lead to smell/odour buildup.

Q5

(c) Initial Population = 1,75,000
Increased population = 2,62,500

$$\text{Increase} = 2,62,500 - 1,75,000 \\ = 87,500$$

Average % increase =

$$\frac{\text{Increase}}{\text{Initial Population}} \\ \frac{87,500}{1,75,000}$$

$$\frac{35}{70} \\ = \frac{1}{2}$$

$$= \frac{1}{2}$$

= 0.5 % increase

R.W

$$\frac{2,62,500}{1,75,000} \\ = 1.5$$

$$\frac{0.5}{1}$$

(d) Cost price of 1 dozen eggs = Rs 375
 C.P of 1 egg = Rs 31.25

C.P of 20 dozen = $20 \times 12 = 240$
 $= 240 \times 31.25$
 $= \text{Rs. } 7500.00$

S.P of 1 egg = Rs. 33

S.P of 240 eggs = 240×33
 $= 7920$

Profit = S.P - C.P
 $= 7920 - 7500$
 $= \text{Rs } 420$

Profit % = $\frac{\text{Profit}}{\text{original price}} \times 100$

$= \frac{420}{7500} \times 100$

$= \frac{420}{75} \times \frac{100}{100}$
 $= 5.6$

$= 5.6\%$

Profit % = 5.6%

Ru	
31.25	240
12 375.00	33
36	20
15	24
12	33
20	72
24	72
3125	72
24	72
12500	5.6
6250 x	5/28.0
75000	25
	30