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SECTION A

1. 40 W bulb has higher electrical resitance.

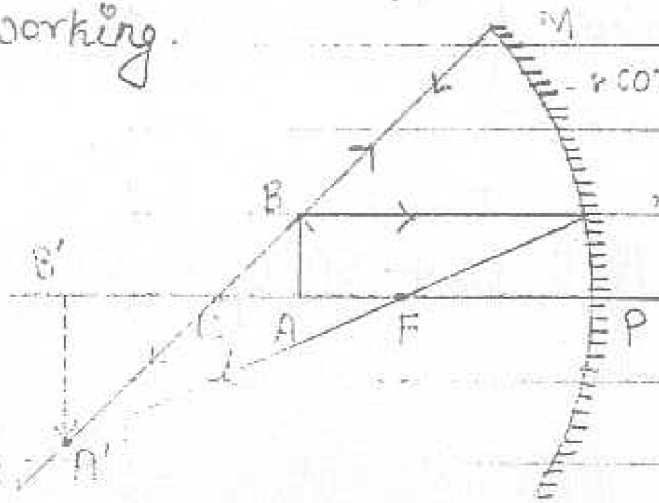
We know, $R = \frac{V^2}{P}$ $\therefore R \propto \frac{1}{P}$, Hence bulb having less power has higher electrical resitance.

2. Series arrangement is not used for connecting domestic appliances because :-

(1) In series, same current flows in circuit But different appliances like fan & heaters require different currents.

(2) If one component fails, Other components (appliances) also stop working.

3.



A'B' shows real, inverted and enlarged image of Object AB.

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4. Flow of acid rain water into a river makes the survival of aquatic life in the river difficult because-

(1) Acid rain water has pH below 5.6. Hence it reduces the pH of river water.

(2) Aquatic organisms survive in pH range of 7.0 - 7.8. Hence, their survival in reduced pH becomes difficult.

5. Respiration: $C_6H_{12}O_6 + 6O_2 \longrightarrow 6H_2O + 6CO_2 + \text{Energy}$

Energy required in our body is provided by Respiration. Since, Respiration is accompanied by release of energy (heat), it is considered as exothermic reaction.

b. $2FeSO_4(s) \xrightarrow{\text{Heat}} Fe_2O_3(s) + SO_2(g) + SO_3(g)$

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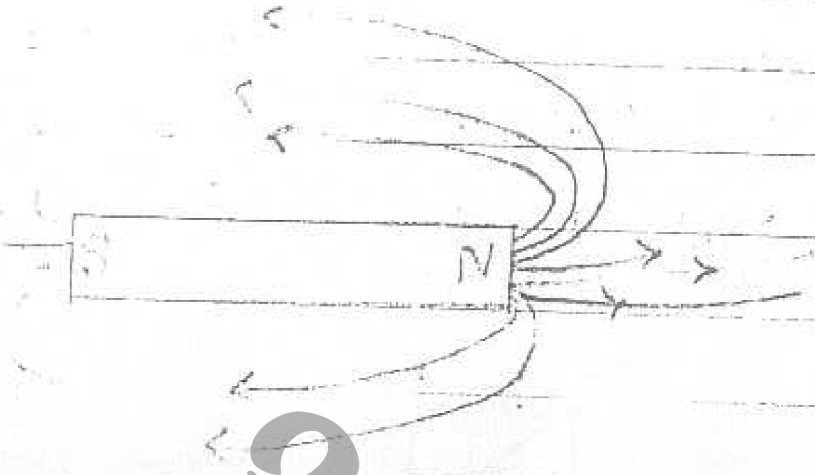
7.



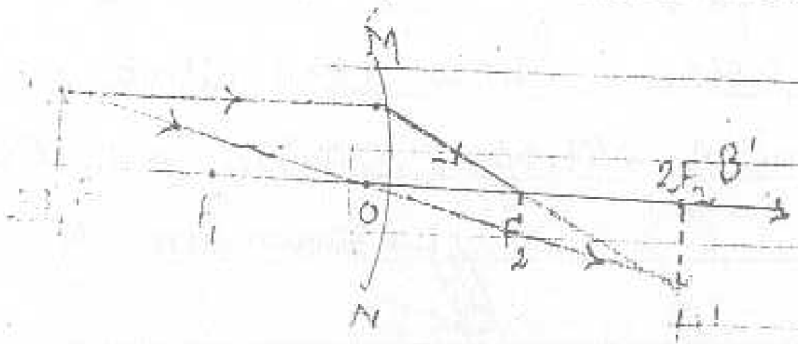
Properties of Magnetic Field Lines - Magnetic field around Bar Magnet.

(i) They have both direction and magnitude. They originates from North to South.

(ii) Magnetic field lines are closed curves.

(iii) Magnitude is more near poles (closeness of magnetic field lines).

8.



AB - object

A'B' - image

Nature - real and inverted

Position - at $2F_2$

Size - Same as object

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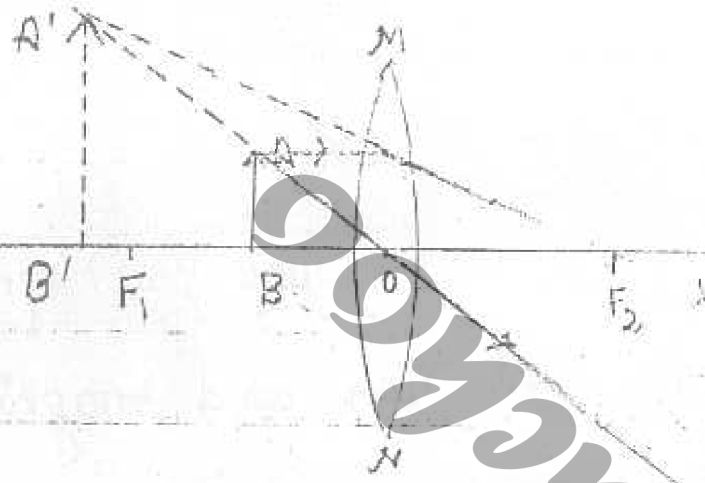
(2) between F_1 and O.



AB - Object

A'B' - Image

Nature - Virtual and E

Size - Enlarged

Position - Same side of

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9 Example of Decomposition Reaction-

$$2Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s) + 4NO_2(g) + O_2(g)$$

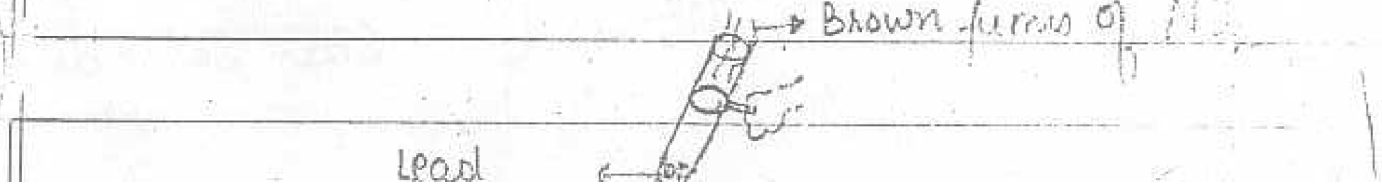
Brown fumes

Activity.

(1). Take 2 spatula of Lead Nitrate in a test tube

(2) Using a holder heat Lead nitrate on a Bunsen burner

(3) Brown fumes of Nitrogen dioxide are observed.



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10 Chemical formula of bleaching powder : $CaOCl_2$

[Calcium oxychloride]

Bleaching powder is prepared by passing Cl_2 on dry slaked lime.

$$Ca(OH)_2 (s) + Cl_2 (g) \longrightarrow CaOCl_2 + H_2O$$

It is used for bleaching wood pulp in paper industries.

11. • Two metals which react violently with cold water :

Sodium (Na), Potassium (K)

• Observations :-

(1) Following reactions take place when they are dropped into water :

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2 + Heat$$

$$2K + 2H_2O \longrightarrow 2KOH + H_2 + Heat$$

(2) There is strong fizzing sound of Hydrogen.

(3) Evolved Hydrogen gas immediately catches fire.

(4) Beaker becomes hot since the reaction is exothermic.

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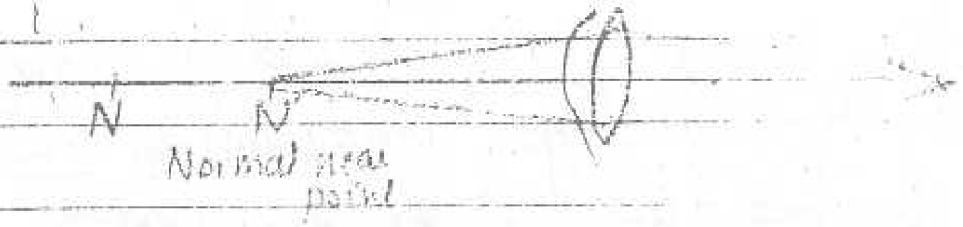
(b) Hypermetropia - (Far Sightedness) - The defect of eye in which a person can see far objects clearly but can't see nearby objects clearly. The near point of such an eye is more than 25 cm.

(1) Hypermetropic Eye



(2) Correction with convex lens

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12. (a)

Overloading	Short-circuiting
(i) When too many devices are connected in a single circuit (socket), the circuit gets damaged. This is known as overloading.	(i) When live and neutral wire come in direct contact, the amount of current increases, thus damaging the circuit. This is called short circuiting
(ii) It happens when many appliances are connected in same socket or there is some hike in power supply.	(ii) It happens when insulation cover of wires are damaged or when the appliance is not working properly.

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(b) Toasters are made of an alloy rather than pure metal because :-

(1) Alloy generally have higher resistivity than metals. Thus they can convert more electricity into heat energy.

(2) Also Alloys don't oxidise (burn) even at high temperatures.

(3) They are chemically less reactive than metals.

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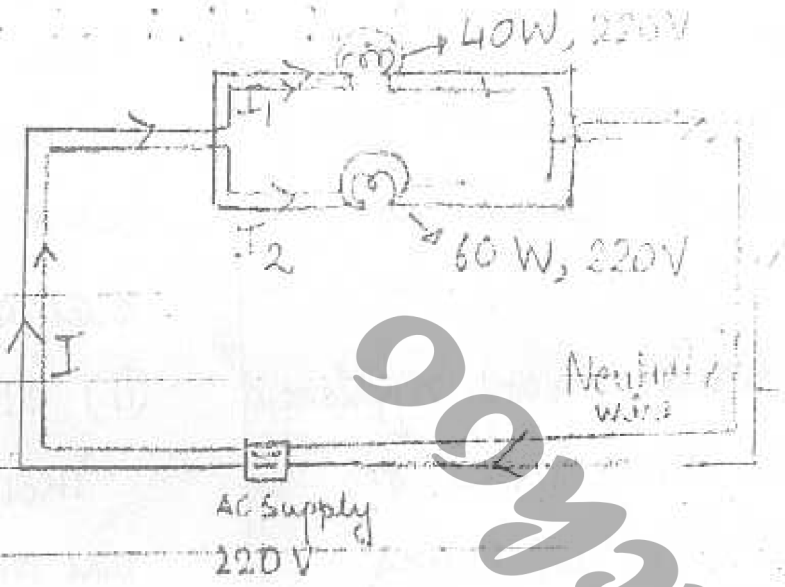
4. (a)



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(b) Current drawn by 40 W bulb = $I_1 = \frac{P}{V}$ [$P = VI$]

$\therefore I_1 = \frac{40}{220}\ A = 0.18\ A$

Current drawn by 60 W bulb = $I_2 = \frac{P}{V} = \frac{60}{220}\ A = 0.27\ A$

$\therefore$ Total current drawn from circuit, $I = I_1 + I_2 = (0.18 + 0.27)\ A$

$= 0.45\ A$

(c) Energy consumed by 40 W bulb in 1 hour = $P \times t = 40$ Wh

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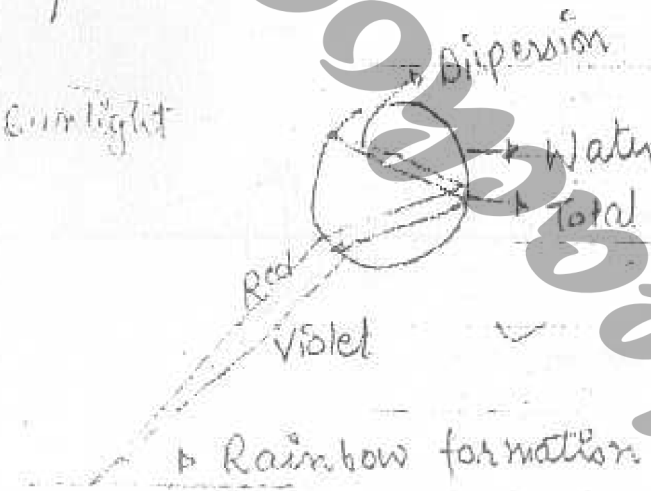
∴ Total energy consumed = 40 Wh + 60 Wh

= 100 Wh

= 0.1 kWh [∵ 1 kWh = 1000 Wh]

15. (a) Dispersion- When a beam of light passes through a glass prism, it splits into seven colours (VIBGYOR). This phenomenon is known as dispersion of white light.



Tiny water droplets in the sky act as small prisms. When sunlight passes through them, they first refract, then disperse, reflect it internally and finally refract it again to form rainbow.

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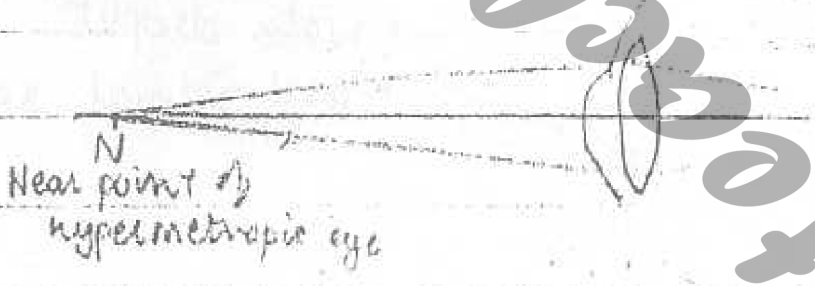
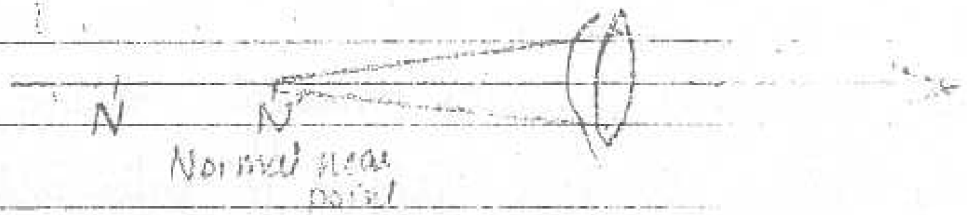
(b) Hypermetropia - (Far Sightedness) - The defect of eye in which a person can see far objects clearly but can't see nearby objects clearly. The near point of such an eye is more than 25 cm.

(1) Hypermetropic Eye





(2) Correction with convex lens

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16. (a)(i) Element in I st group, III rd period - Sodium (Na)

(ii) VII th group II nd period - Fluorine (F)

(b) (i) Oxide of Nitrogen - N_2O_5

[General - R_2O_5]

(ii) hydride of Oxygen - H_2O

[General - RH_2]

(c) In group VIII of periodic table, cobalt with atomic mass 58.9 appears wt before Nickel (58.7) because cobalt is chemically similar to Rhodium and Iridium and Nickel is chemically similar to Palladium and Platinum.

(d) Besides Gallium two other elements discovered are -

(1) Germanium [Eka - Silicon]

(2) Scandium [Eka - Boron]

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(e) Atomic mass of Li = 6.9
Atomic mass of Na = 23
Atomic mass of K = 39.1

∴ Average Atomic mass of Li & K = $\frac{6.9 + 39.1}{2}$ = 23

∴ Average Atomic mass of Li and K = Average atomic mass of Na

Conclusion-

(1) Dobereiners Traids occur in Mendelaw's Periodic Table also.

(2) When chemically similar elements are arranged in increasi atomic mass, atomic mass of middle element is the avera of atomic mass of other two elements. [Dobereiner's law of Triad

SECTION B

17. There are following effects of DNA copying not being accurate

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not exactly similar to parent.
(2) When DNA changes are very drastic, the new cell doesn't survive.
(3) It leads to survival advantage in some cases.

18. Obtaining of CO_2 :-
(1) Autotrophs obtain CO_2 from air through their stomata [openings], present in leaves, stem.
Obtaining of N_2 :-
(1) Autotrophs obtain N_2 in the form of Nitrates and Nitrites] dissolved in water from soil through their roots.

19. Reasons for replacing firewood by alternate sources of energy :-
(1) It produces much smoke on burning, Thus it causes air pollution
(2) It releases very small amount of energy on burning [Low Caloritic Value].

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(3) It leaves a residue [wood ash] on burning
(4) Using firewood as fuel causes deforestation.

20. (a) Winds- To extract energy from winds, large wind mills have to be erected. But these mills can only be established those areas where wind flows for larger part of year. Minimum speed - 15 km/h. It also requires high level of maintenance.

(b) Tides - (1) Energy can be extracted only in few places.
(2) Building structures in sea-water requires high cost.

21. Characteristics of Biogas :-
(1) It contains 75% methane and thus gives a large amount of heat on burning. [High calorific value],
(2) It is compositively smokeless.

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22. Two sexually transmitted diseases - HIV-AIDS, Syphilis, Gonorrhoea

Prevention :-

(1) Covering for penis like condom while having sex.

(2) Avoid sex with unknown peoples.

23. • Fossils are the prehistoric remains of dead plants and animals trapped on rocks of earth.

Information that fossils provide us on evolution -

(1) It helps to study organ structure of pre-historic animals.

(2) It tells us which type of animals lived at what time on Earth.

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24. (a) Blood vessels - (Arteries, Veins, Capillaries). They carry from heart to body organs and also from body organs to heart.

(b) Blood platelets - They help in plugging any leak in blood vessels (Blood coagulation)

(c) Lymph - (Tissue Fluid) - It carries digested fat and proteins from Intestine to veins. It drains extra cellular fluid back to blood.

(d) Heart - Heart is a pumping organ which helps to purify blood to our body organs.

25.

Aerobic respiration	Anaerobic respiration
1. It takes place when glucose is completely broken down in presence of oxygen.	1. It takes place when glucose is partially broken down in absence of oxygen.

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[in mitochondria]

3- It takes place in our body cells to give CO_2 and H_2O.

3. It takes place in yeast to give Ethanol and CO_2 and in our muscle cells to give Lactic Acid.

6* Ozone (O_3) is formed by action of UV radiations on Oxygen in upper atmosphere.

(1) $O_2 \xrightarrow{UV} O + O$

Oxygen → Oxygen atoms

(2) $O_2 + O \longrightarrow O_3$

Ozone

* Ozone is a protective layer which prevents us from harmful Ultra-Violet radiations. UV radiations cause Skin Cancer in humans. Hence damage to Ozone is a cause of concern for us.

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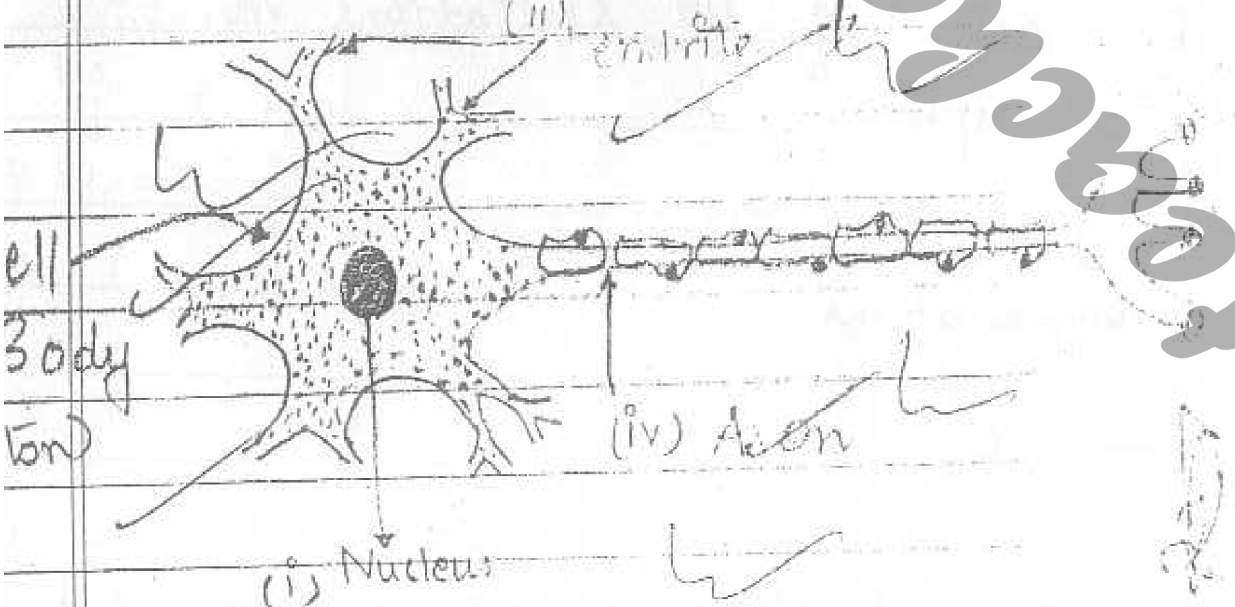
• Ozone (O_3) layer is damaged by Chloro - Fluoro Carbon (CFC_s) which are used as refrigerants & fire extinguishers.

27. (a) Structure of Neuron



(b) (i) Part of Neuron where information is acquired.

Dendrite Tip

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