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CLASS	10 th	SUBJECT	Science
ROLL NO.		DATE	13/2/2024

SSLC Model Question paper - 4 - Key answers

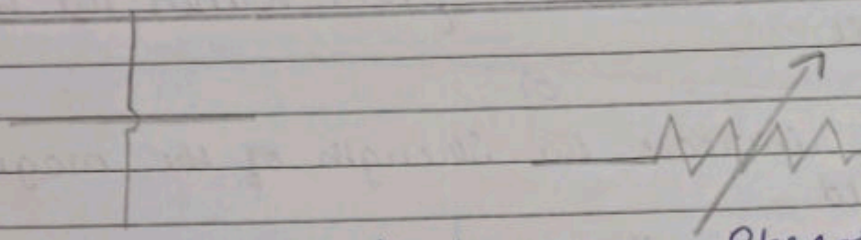
part A - [PHYSICS]

I 1. A) Read and magnified.

2. B) Hypermetropia, use of Suitable convex lens

3. A) Size of the particles in medium A is more than that of B medium.

II 4.



wires crossing without joining — Rheostat

5. Refractive index of a medium is always greater than 1 or it cannot be less than 1 because the speed of light in any medium is always less than that in a vacuum.

III 6. Laws of reflection

(i) The angle of the reflected ray equals to the angle of the incident ray, with respect to normal.

(ii) The incident ray, reflected ray and normal all lie in the same plane.

$\angle i = \angle r$

or

power of a lens is its ability to converge or diverge the rays of light falling on it. power of a lens is

equal to reciprocal of the focal length of the lens.
SI - unit of power is dioptre (D)

7. Electromagnets can be created by wrapping a wire around an iron nail and running current through the wire. The electric field in the wire coil creates a magnetic field around the nail. In some cases the nail will remain magnetised even when removed from within the wire coil

or

To increase the strength of the magnetic field
(i) increase the number of turns of the coil
(ii) increase the current flowing through the coil.

IV 8. A region around a magnet or current-carrying wire where magnetic forces can be detected is called magnetic field.

properties of magnetic field

1. They emerge from the north pole to South pole in the outside of magnet
2. They are contin, forming closed loops.
3. they cannot interset each other
4. Density of lines represents strength of magnetic field.

or

Short circuiting - It occurs when live and neutral wires come in contact with

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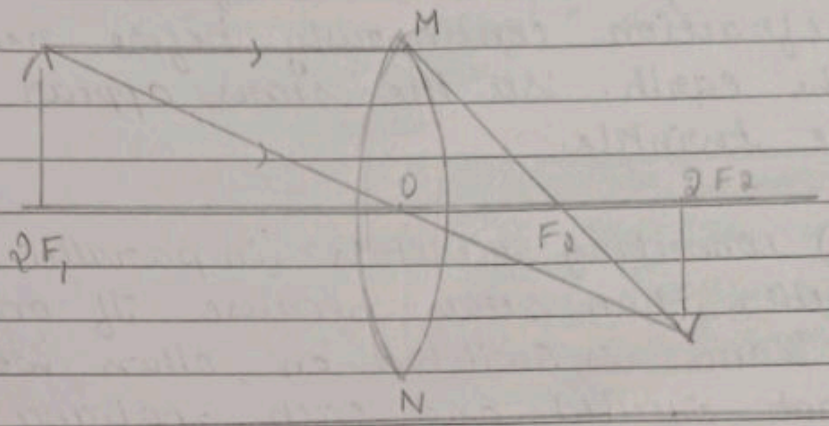
each other.

measures to prevent damage due to short circuit :

1. use fuses or circuit breakers
2. proper insulation of wires & connections.

9.



10. Given :

Length = 2 m

Resistance = 28 Ω

Temperature = 0.04 mm = 0.00004 m

$\text{radius} = \frac{d}{2} = 0.00002\ m$

Resistivity = R × A × L

$= \pi r^2 = \pi (0.00002)^2$

$1.256 \times 10^{(-9)}\ m^2$

$= 28 \times 1.256 \times (-9)/2$

$= 1.76 \times 10^{-18}\ \Omega$

approximately $1.76 \times 10^{(-8)}\ \Omega\ m$

V II. (i) water droplets acts as tiny prism in the sky. the Sunlight when enters tiny droplets undergo internal reflection & also refract these rays which

which are dispersed causing a band of seven colours called rainbow rainbow is always formed in the direction opposite to the Sun.

(ii) Twinkling of Stars is due to atmospheric refraction. light from the stars on entering the earth's surface undergoes refraction continuously before reaching the earth. so the stars appear to be twinkle.

VI 13. a) connecting resitors in parallel is better than series because If one app -liance is switched on, others we are not affected and each appliance gets the same and full voltage, In case of any failure only the appliance connect -ing the faulty pathway will stop working. All the other pathways of the circuit remain unaffected

b) Joule's law of heating proda: States that the heat produced in a condu -ctor is directly proportional to the Square of the current and the resistance. A bulb works by passing electricity through a filament, which has resistance. According to joule's law this generates heat, producing light.

part - B
[Chemistry]

VII 13. c) catenation.

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14. A) ZnO & C

15. A) the concentration of OH^- ions increase

VIII 16. Rancidity can be prevented using the following methods:
Adding antioxidants to food and also Storing them in a airtight containers.

17. $CH_3 - CO - CH_3$

This is also known as acetone or propanone

18. H_3O^+ (hydronium ion donates H^+ ion easily showing acidic character Alcohol (C_2H_5OH) does not donate H^+ ion easily due to its convalent O-H bond.

IX 19. (i) 'a' is ethylene (ethene) an unsaturated hydrocarbon and 'b' is ethane, a Satu - rated hydrocarbon

(ii) & 'a' is ethane (unsaturated)
'b' ethane (saturated.

20. $Pb(NO_3)_{2(aq)} + 2KI_{(aq)} \rightarrow PbI_{2(s)} + 2KNO_{3(aq)}$

This reaction is a double displacement reaction and also a precipitation reaction.

21. (i) Baking Soda is a mild base and reacts with exess hydrochloric acid in the Stomach neutralizing it & providing relief from acidity.

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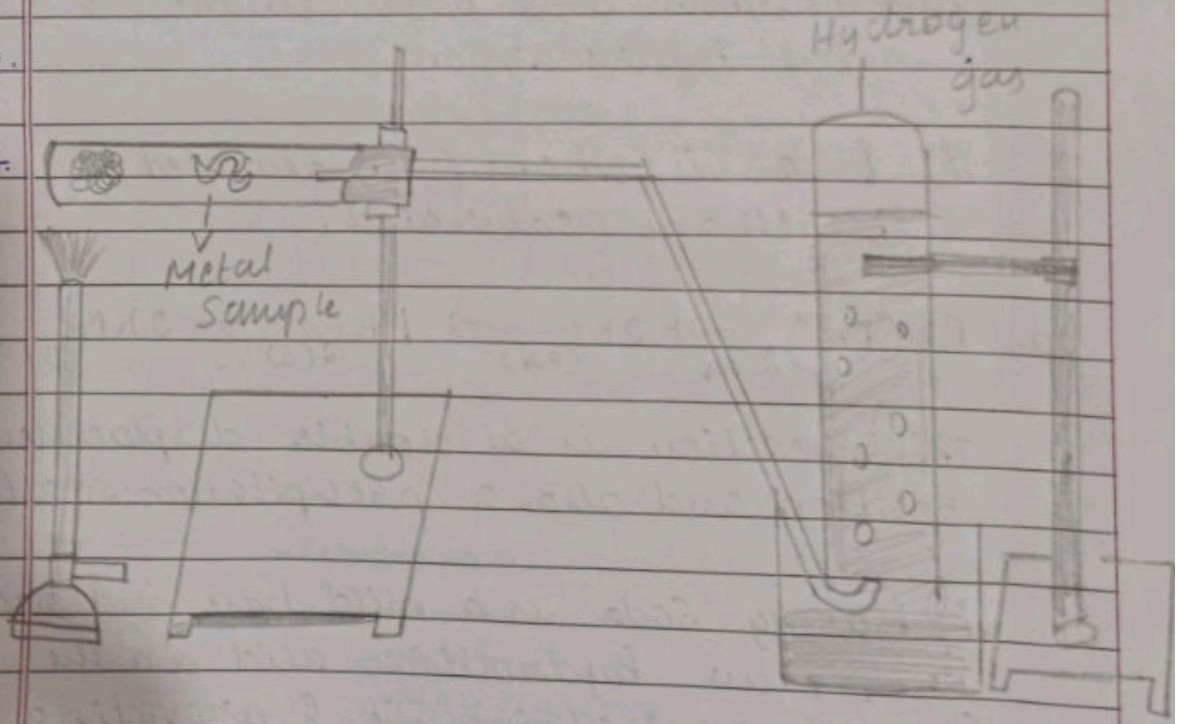
(ii) Baking powder is used in bakeries because it releases carbon dioxide gas causing dough to rise & makes baked goods soft and fluffy.

23. a) When water is added to acid, it can cause a violent reaction, releasing heat and splashing. adding acid to water slowly & carefully helps to reduce heat release and prevent splashing and accidents.

b) Hydrochloric acid (HCl) is a strong acid because it completely dissociates in water.

Acetic acid (CH_3COOH) is a weak acid because it only partially dissociates in water.

22.



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or

To identify the nature of the three Solutions, litmus paper can be used. When the litmus paper is dipped into the distilled water, there will be no color change, indicating that Solution is neutral. In contrast, when the litmus paper is dipped into the the acidic Solution, the litmus paper will turn red indicating acidity Lastly when dipped in basic Solution the litmus paper will turn blue, confir-ming its basic nature.

Q4 i) Structural isomers are compounds with same molecular formula but different Structural arrangements of atoms.

ii) Esterification is a chemical reaction in which an acid (usually a Carboxylic acid) reacts with an alcohol to form an ester and water.

iii) Micelles : Aggregated Surfactant molec-ules with hydrophillic outer surface and hydrophobic inner core.

or

a) Substitution reaction : A Chemical reaction where an atom or group of atoms is replaced by another atom or group in a molecule.

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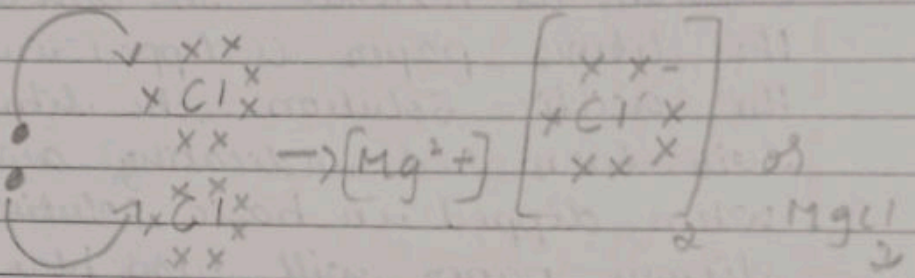
b) Methane (CH_4)

c) oxidizing agents :- Substance that cause oxidation by accepting electrons often resulting in the loss of hydrogen or the gain of oxygen

XI 25 a)



b) Roasting :- involves heating of ore lower than its melting point in the presence of air or oxygen and carried out mostly for Sulfide minerals.

Calcination :- involves thermal decomposition of carbonate ores and CO_2 gas is evolved

c) Solder is an alloy of lead and tin It contains 50% lead and 50% Tin it is an alloy which has a low melting point so used for soldering (welding) electrical wires together.

part - C

Biology

XII 26. B) Herbivores

27. A) Dominant trait.

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XIII 28. Xylem transports water and minerals from roots to leaves, while Stomata allow water vapor to escape into the air.

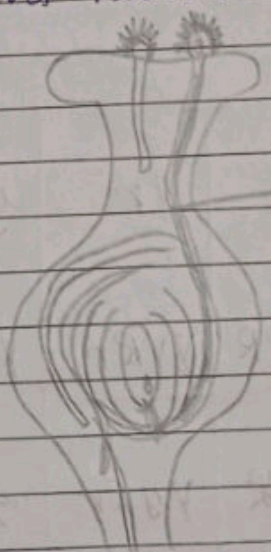
29. Vegetative propagation helps farmers by providing disease-free & high-yielding crops quickly so considered as boon to the farmers.

30. Father alone is responsible to determine the sex of a child because sperm determines the sex of the child, carrying either an X (female) or Y (male) chromosome.

XIV 31. Two needs for separating non biodegradable waste.

* prevents pollution
* conserves natural resources.

32.



33. The process taking place in part B is called pollination. its significance is that it allows the transfer of pollen grains from male part (anther) of a flower to the female part (Stigma) which is necessary for fertilization to

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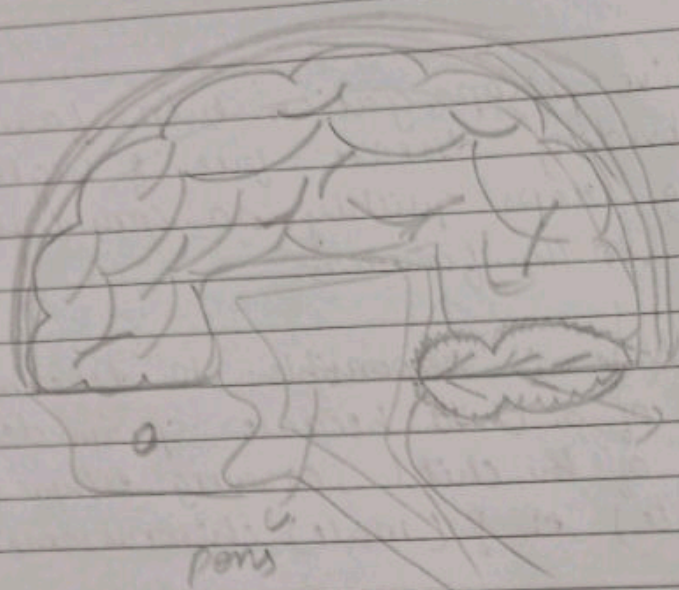
occur and ultimately produce seeds.

(V)

34



35. YYRR × YYrr phenotyp - 9:3:3:1

↓

YyRr

	YR	YR	Yr	yr
YR	YYRR	YyRR	YYRr	YyRr
yR	yyRR	YyRR	YyRr	yyrr
Yr	YYRr	yyRr	YYrr	Yyrr
Yr	YyRr	yyRr	Yyrr	yyrr

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Monohybrid cross.

Tall — TT

Dwarf — tt

Tt

	T	t
T	TT	Tt
t	tT	tt

phenotypic = 3:1
genotypic = 1:2:1

36. a) Reflex arcs continue to be more efficient for quick responses due to their short pathway, prevention of delays, protective mechanisms, conservation of energy & adaptation to the environment.

b) plants respond to their environment by growing in a specific direction to get more light known as phototropism Auxins, a class of plant hormones, causes rapid cell growth on one side of the stem, resulting in bending of curving of the plant.

XVI 37. a) * Arteries - have thick elastic & more muscular walls. helps to carry oxygenated blood away from the heart to all of the body's tissue.

* Veins - they have thin and less muscular walls. they carry deoxygenated blood from the various tissues to the heart.

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* capillaries - Is a narrow blood vessel whose walls have a thin layer of endothelium cells. and capillaries are the terminal branches of arteries which rejoin to form a vein and helps to deliver nutrients & oxygen to cells throughout your body.

b) Double circulation refers to the two separate circuits of the blood flow in the body

i. pulmonary circulation
(heart → lungs → heart)

ii. Systemic circulation
(heart → body → heart)

38. a) Testis :- produces Sperm & Testosterone
prostate gland - Secretes fluids that nourish and helps to transport the sperm to a female body.

b) The embryo receive nourishment from the mother's blood through the placenta and umbilical cord. Nutrients & oxygen diffuse from the mother's blood into the placenta, and are then carried to the embryo through the umbilical cord, providing essential nourishment for growth and develop-ment of a baby.

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(or)

a) The different methods of contraception (birth control) followed in human beings are :

Barrier methods like condoms, diaphrag-am ~~on~~, hormonal methods pills, injet-tions and implants, Intrauterine devices (IUDs) vaginal rings, sterilisation and many methods are used.

b) Fragmentation	Regeneration
* occurs in multi-cellular organisms with simple body organisation.	* occurs in fully differentiated multi-cellular organisms with complex body
* In fragmentation, an organism breaks into pieces and each piece develops into new individual	* In regeneration organisms breaks into pieces, each piece may develop into new individual.
* No Specialised cells are involved	* Ex Regeration is more commonly seen in animals than in plants (scar tissue.
* Ex: Spirogyra	

Thank you ...