केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली
सैकण्डरी स्कूल परीक्षा (कक्षा दसवीं)
परीक्षार्थी प्रवेश–पत्र के अनुसार भरें

विषय Subject : **Science**

विषय कोड Subject Code : **086**

परीक्षा का दिन एवं तिथि
Day & Date of the Examination : **13.03.2019 (Wednesday)**

उत्तर देने का माध्यम
Medium of answering the paper : **English**

प्रश्न पत्र के ऊपर लिखे कोड को दर्शाएं Write code No. as written on the top of the question paper	Code Number **3 1 1 3**	Set Number ① ② ● ④

अतिरिक्त उत्तर–पुस्तिका (ओं) की संख्या
No . of supplementary answer -book(s) used : **1**

विकलांग व्यक्ति :
Person with Disabilities : हाँ / नहीं   Yes / No : **No**

किसी शारीरिक अक्षमता से प्रभावित हों तो संबंधित वर्ग में ✓ का निशान लगाएं।
If physically challenged, tick the category

B	D	H	S	C	A

B = दृष्टिहीन, D = मूक व बधिर, H = शारीरिक रूप से विकलांग, S = स्पास्टिक
C = डिस्लेक्सिक, A = ऑटिस्टिक
B = Visually Impaired, D = Hearing Impaired, H = Physically Challenged
S = Spastic, C = Dyslexic, A = Autistic

क्या लेखन – लिपिक उपलब्ध करवाया गया : हाँ / नहीं
Whether writer provided : Yes / No : **NO**

यदि दृष्टिहीन हैं तो उपयोग में लाए गये
सॉफ्टवेयर का नाम :
If Visually challenged, name of software used :

*एक खाने में एक अक्षर लिखें। नाम के प्रत्येक भाग के बीच एक खाना रिक्त छोड़ दें। यदि परीक्षार्थी का नाम 24 अक्षरों से अधिक है, तो केवल नाम के प्रथम 24 अक्षर ही लिखें।
Each letter be written in one box and one box be left blank between each part of the name. In case Candidate's Name exceeds 24 letters, w ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ letters.
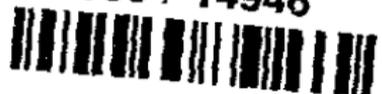
कार्यालय उपयोग के लिए
Space for office use

1654879
086 / 14946

Instructions to Candidates

1. Make sure that the answer-book contains 32 pages and are properly serialed in number (including title pages) as soon as you receive it.
2. DO NOT make any special sign or mark in or outside the answer-book, supplementary answer-book, graph-paper, map etc.
3. DO NOT write your roll no., name of your school or place of examination in any of your answers.
4. You must write the supplementary answer-book serial no. in the attendance sheet.
5. Write on each ruled line on both sides and do not waste pages by leaving a wider margin.
6. DO NOT tear out or fold the pages of the answer-book and do not leave any page blank unnecessarily. No supplementary anwer-book(s) should be asked for unless this answer-book / the previous supplementary answer-book is finished.
7. Number your answers according to their numbers in the question paper.
8. Draw a line when a question (or a part thereof) is finished.
9. Securely tag your answer-book with supplementary answer-book(s), graph-paper, map etc, if used by you, but DO NOT write your Roll No. on the supplementary answer-book, graph-paper, map etc.
10. Use only blue-black or royal-blue ink/gel/ball point pen. Using of any other writing instrument/ink/pencil etc will be on your own risk and responsibility.
11. For rough calculation etc., appropriate margin on the right-hand side of the page may be drawn. The rough calculations etc. should be crossed out afterwards.
12. DO NOT leave the examination hall without handing over the answer-book to the Asstt. Supdt.
13. If during the course of examination, a candidate is found indulging in any of the following, he/she shall be deemed to have used unfair means at the examinations, and as such his/her result shall not be declared but shall be marked as UNFAIR MEANS (U.F.M.) :-
    (a) having in possession papers, books, notes or any other material or information relevant to the examination in the paper concerned;
    (b) giving or receiving assistance directly or indirectly of any kind or attempting to do so;
    (c) writing questions or answers on any material other than the answer book given by the Centre Superintendent for writing answers;
    (d) tearing of any page of the answer-book or supplementary answer-book etc.
    (e) contacting or communicating or trying to do so with any person, other than the Examination Staff, during the examination time in the examination centre;
    (f) taking away the answer-book out of the examination hall/room;
    (g) using or attempting to use any other undesirable method or means in connection with the examination;
    (h) smuggling out Question Paper or its part or smuggling out answer-book/ supplementary answer-sheet or part thereof, and
    (i) threatening any of the officials connected with the conduct of the examinations or threatening of any of the candidates.

Q. No.	01	02	03	04	05	06	07	08	09	10	TOTAL
MARKS			2	2	2	3	3	3	3	3	23

Q. No.	11	12	13	14	15	16	17	18	19	20	TOTAL
MARKS	2	3	3	3	3	5	5	5	4	5	38.5

Q. No.	21	22	23	24	25	26	27	28	29	30	TOTAL
MARKS	5	2	2	2	2	2	2				17

Q. No.	31	32	33	34	35	36	37	38	39	40	TOTAL
MARKS											

	GRAND TOTAL	78.5
MARKS IN WORDS	Seventy Nine	

CBS

प्रमाणित किया जाता है कि मैंने इस उत्तर पुस्तिका का मूल्यांकन उचित प्रश्नपत्र के सेट और अंकन योजना के अनुसार किया है। यह भी प्रमाणित किया जाता है कि उत्तर पुस्तिका के अन्दर कोई

Section - 'A'

Ans-1. I would prefer solar energy for heating my food. I would choose it because it is a renewable source of energy and pollution free.

Ans-2. Voltmeter measures the potential difference.

Section - 'B'

Ans-3.

The image distance does not depend on distance of object. It forms always on retina. Therefore image distance will not change.

Ans-4. Functions of pancreas in our body:-

(a) To produce insulin hormones.

(b) To produce pancreatic juice which contains trypsin, and lipase

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Ans-5. The basic structure of modern periodic table is based on the electronic configuration of atoms in following manners-

a) The elements having same valency or same no. of electrons in its outermost shell are placed in same group

b) The elements having same number of shells are placed in same period

Section - 'c'

Ans-6. Ecosystem - A place where abiatic components (water, soil, temperature etc) and biotic components (plant, animals, microorganisms) interact with each other and make life possible, is called an ecosystem.

Producers	→	Primary Consumers	→	Secondary consumers	→	Tertiary consumers
ie. Plants		i.e. Goat, Cow		i.e. fox, wolf		i.e. Tiger, Lion
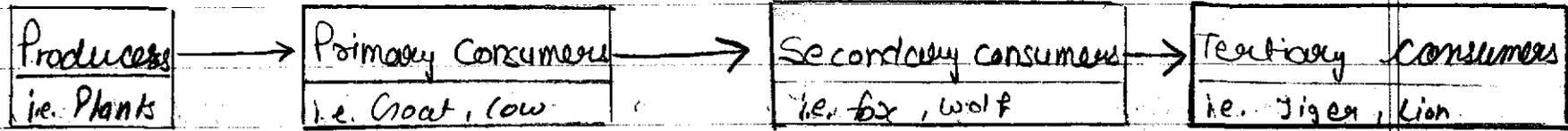
How of energy in an ecosystem

P. T. O

Ans-7. (i) Advantages of exploiting resources with short term gains :-

(a) More resources will be available for a short time.

(b) Our needs can be easily fulfilled. $1\frac{1}{2}$

(c) Economy will grow and become strong.

(ii) Advantages of using a long term perspective in managin our natural resources :-

a) It will cause less harm to environment.

b) Next generations can use these resources. $1\frac{1}{2}$

c) Resources will last for a long time.

(3)

Ans-2 A rainbow is a beautiful spectrum of colours of light. It forms after rain. The rain drops suspended in air act as natural prism which disperse the light

Rainbow
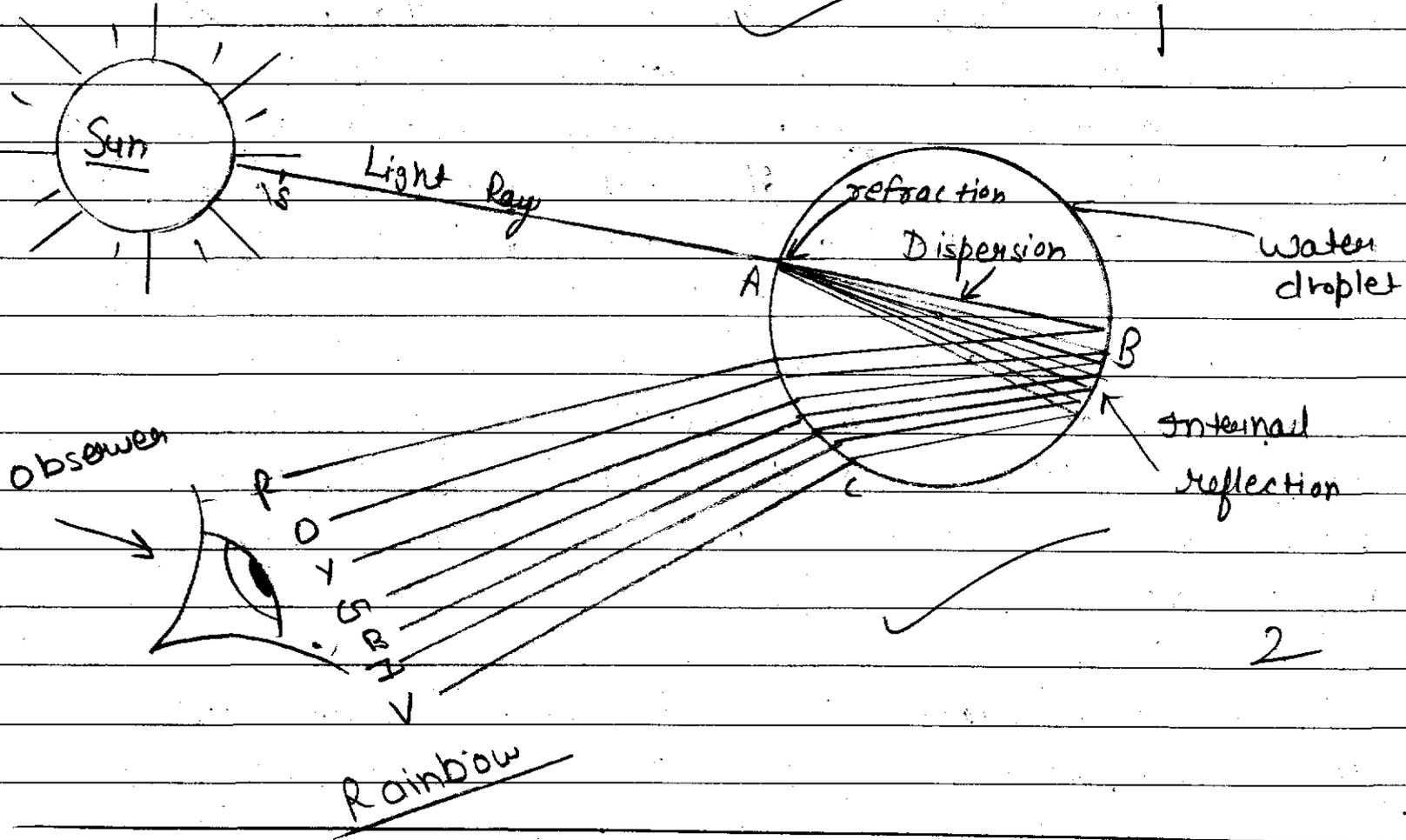
Ans-g ③ Nervous and harmonal system together perform the function of control and coordination of body in human beings as:-

a) Human nervous system detect the changes and response to it by electrical impulses. The main centre of human nervous system is our brain from where all the movement and actions of body are controlled.

b) The endocrine glands system is responsible for various functions like growth, maintaning the body metabolism and various other function. This system is necessary for various responses and actions.

i.e. When blood sugar level increases in our body, the pancreatic cells detect it. As a result

more insulin hormone is made by pancreas. When blood sugar levels falls, then again pancreatic cells detect it and they reduce the ammount of insulin hormone made by pancreas.

Ans 10. When a bright light is focussed in our eyes, the receptors present in our eyes (Photoreceptors) detect it and send electrical impulses to our brain. Our brain analyses these impulses and then transmitte the signals for any action. Therefore when these impulses reach our eyes, our iris respond to it by reducing the pupil's size.

sensation of bright light	→	Receptors	——→	Sensory neuron	
					Brain
Response by reducing pupil size	←	Affectors	←	Motor neuron	←
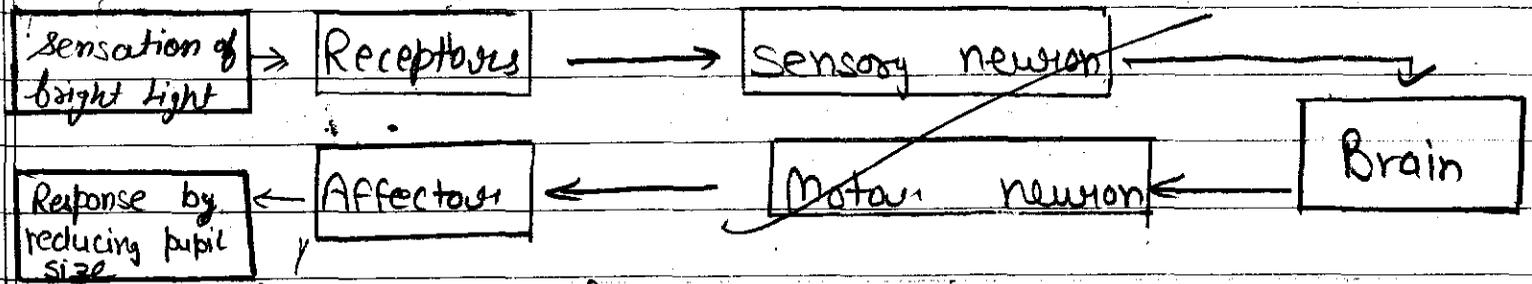
Sequence of events

Ans-11. Photosynthesis ~~is~~ is a process by which green plants and some blue- green bacterias make their food by using simple subtances like CO_2 and water and convert them into complex subtances like carbohydrates in the presence of sunlight and chloropyll

The CO_2 is taken in by stomata and water is taken up by roots. The chloropylls present $\frac{1}{2}$ on leaves use sunlight as a source of energy and make carbohydrates with them. During this process oxygen is released $\frac{1}{2}$ The reaction which takes place is as following:-

$$6CO_2 + 12H_2O \xrightarrow[Chloropyll]{Sunlight} C_6H_{12}O_6 + 6O_2 + 6H_2O + energy$$
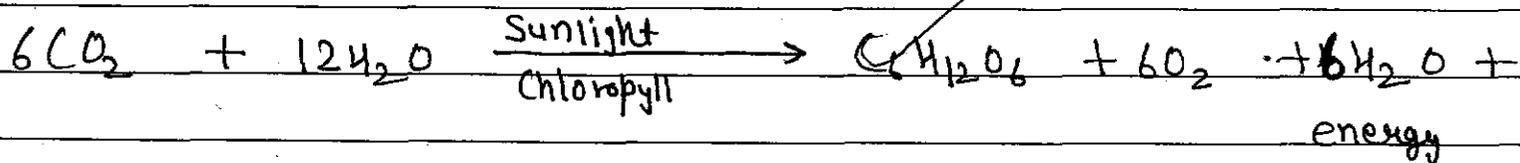
Acquired Traits	Inherited Traits
a) The ~~reacti~~ changes which take place in non-reproductive cells are called acquired traits.	(a) The changes which take place in reproductive cells are called inherited traits
b) Acquired traits cannot be transmitted nor inherited.	b) ~~It~~ Inherited traits can be transmitted as well as inherited
c) i.e. - The knowledge we get during the course of our life.	c) i.e. Our skin colour, colour of eyes etc.

Ans-1)

Ans-13   (a) $Zn (s) + 2AgNO_3 (aq) \longrightarrow Zn(NO_3)_2 (aq) + 2Ag (s)$
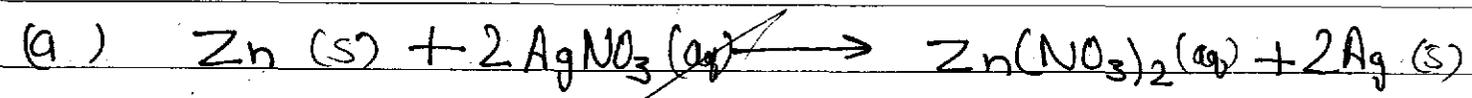
Type — Displacement reaction

(b) $K_2I + Pb(NO_3)_2 \longrightarrow 2KNO_3 + PbI$
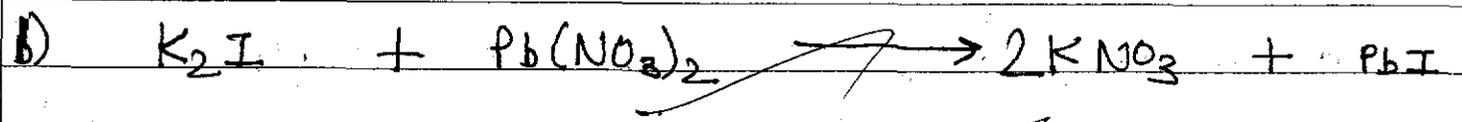
Type — Double displacement reaction

P.J.O

Ans—14):—

(1) [a] Oxides of first group elements — R_2O
(where R is the element of group 1st)

This is because valency of oxygen is (-2) & valency of elements of first group is $(+1)$

So, $R \quad \quad O$
$+1 \quad \quad -2 \implies R_2O$
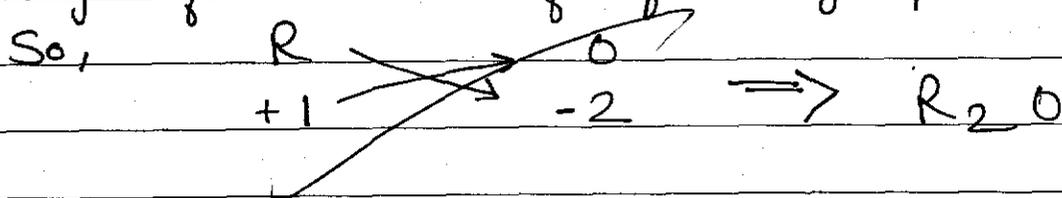
(ii) Halide of the elements of group thirteen — RH_3
(where R is the element of group 13)

This is because valency of hydrogen is (-1) & valency of elements of group 13 is $(+3)$

So, $R \quad \quad H$
$+3 \quad \quad -1$

RH_3
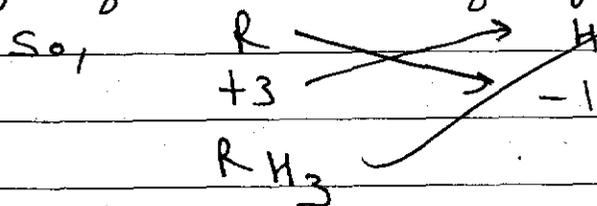
(iii) Valency of an element of group (2) $= +2$
Valency of an element of group (17) $= -1$

So, element $\rightarrow$ A $\quad\quad$ B
valency $\rightarrow$ +2 $\quad\quad$ -1

∴ Compound $\rightarrow$ AB_2

Ans-15. Sodium chloride is an ionic or electrovalent compounds. In solid state it doesn't conduct the electricity due to its rigid 3-dimensional structure. But, in molten or aqueous form, its conduct the electricity because the strong inter-ionic attraction force is overcomed by heat. So, ions can move-freely and conduct electricity.

b) Nitric acid is a strong oxidising agent. When Aluminium is dipped in HNO_3 acid its reactivity decreases and it do not produce Hydrogen gas. Nitric acid oxidised the hydrogen evolved to H_2O and itself reduced to any oxide of nitrogen (N_2O, NO or NO_2).

c) <u>Calcium and ~~Mg~~ Magnesium are very reactive</u> metals. They react with subtances present around them like O_2, acids and other subtance and form compounds. Therefore they are never found in their free state in nature.

P.T.O

Section- 'D'

Ans- 16 -

a) ⑤
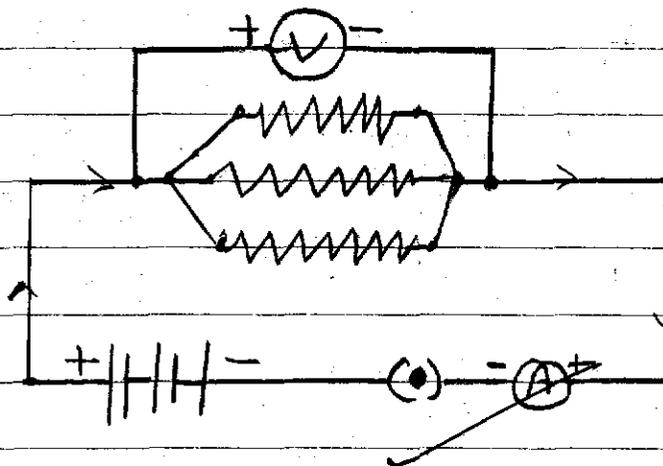
We know that in a parallel combination of resistors the potential difference remains same and the total current flowing through ~~each~~ circuit is equals to the sum of ~~and~~ current flowing through each individual resistor.

OR, $I = I_1 + I_2 + I_3$ —(1) ✓

Now, $\dfrac{V}{R} = I$ —(1) [By ohm law]

$\dfrac{V}{R_1} = I_1$, ~~$\dfrac{U}{R_2}$~~ , $\dfrac{V}{R_2} = I_2$ and $\dfrac{V}{R_3} = I_3$

18

$$\Rightarrow I_1 + I_2 + I_3 = I \qquad (\text{adding } I_1, I_2 \text{ \& } I_3)$$

$$\Rightarrow \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3} = \frac{V}{R}$$

$$\Rightarrow V\left[\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right] = \frac{V}{R}$$

$$\Rightarrow \boxed{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{R}}$$

hence proved.

Therefore the reciprocal of equit equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocal of the individual resistance.

P.T.O

b). $R_1 = R_2 = 12\,\Omega$

$V = 6V$

$I = ?$

let total resistance $= R$

we know that, $\dfrac{1}{R} = \dfrac{1}{R_1} + \dfrac{1}{R_2}$

So, $\dfrac{1}{R} = \dfrac{1}{12} + \dfrac{1}{12}$

$\Rightarrow \dfrac{1}{R} = \dfrac{2}{12}$ ✓

So, $R = 6\,\Omega$

Now, $I = \dfrac{V}{R}$ (By ohm's law)

$\Rightarrow I = \dfrac{6}{6}$

$I = 1\,A$ ✓

So, current drawn from the battery is 1 Ampere

Ans-17.

⑤

Cardboard

← Current carrying

Straight conductor

Battery
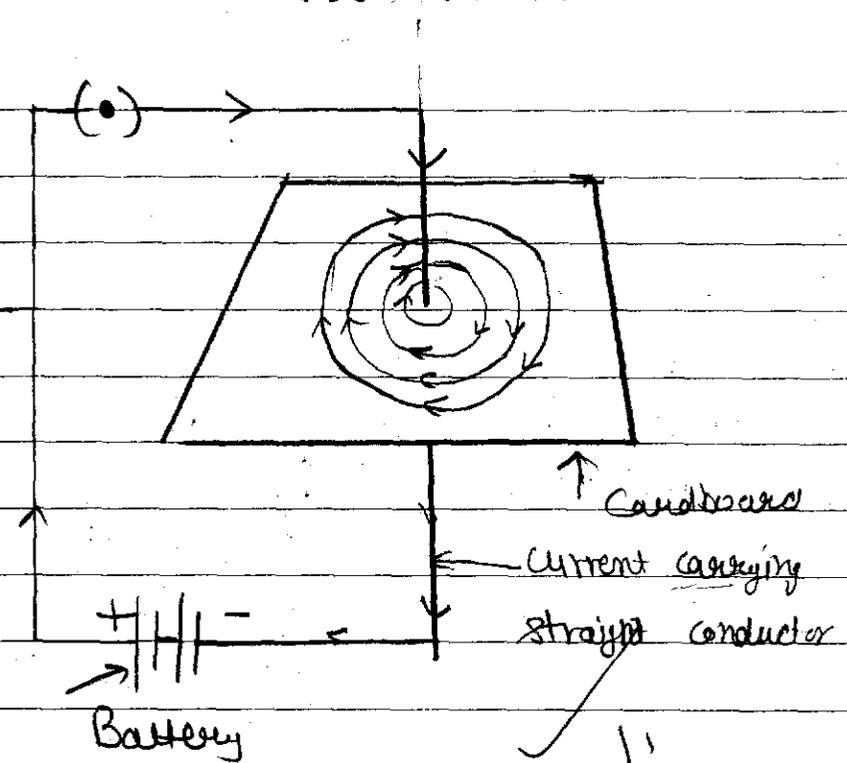
We apply the 'right - hand thumb rule'

Right hand thumb rule- ~~street~~ Imagine you are
holding a current carrying straight conductor
in ~~it~~ your right hand such that your
thumb points towards the direction of current.
They your fingers will wrap around the conductor
in the direction of magnetic field. ½

b) When the point where magnetic field is to be determined is moved away from straing wire carrying constant current, then the strength of magnetic field reduces. This is because —

Magnetic field strength $\propto \dfrac{1}{\text{distance from current carrying conductor}}$

Therefore ~~stren~~ strength of magnetic field decreases

2

P.T.O

Ans18.

⑤

object distance , $(u) = -60\,cm$
focal length , $(f) = -30\,cm$
image distance , $(v) = ?$
magnification $(m) = ?$

(i)

By lens formula, $\dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{f}$

$\Rightarrow \dfrac{1}{v} = \dfrac{1}{f} + \dfrac{1}{u}$

$\Rightarrow \dfrac{1}{v} = \dfrac{-1}{30} + \dfrac{-1}{60}$

$\Rightarrow \dfrac{1}{v} = \dfrac{-2 + (-1)}{60}$

$\Rightarrow \dfrac{1}{v} = \dfrac{-3}{60}$

$\Rightarrow V = -20\,cm$

So, distance of image from the lens is $-20\,cm$.

(ii) magnification $(m) = \dfrac{v}{u}$

$$m = \dfrac{-20}{-60} = +\dfrac{1}{3} = +0.333$$

So, a) Nature — virtual image ✓

b) Position — at a distance of 20 cm on left side of lens |

c) Size — Smaller / diminished by a factor of $\dfrac{1}{3}$ or $+0.333$

d) erect image ✓ |

(iii)
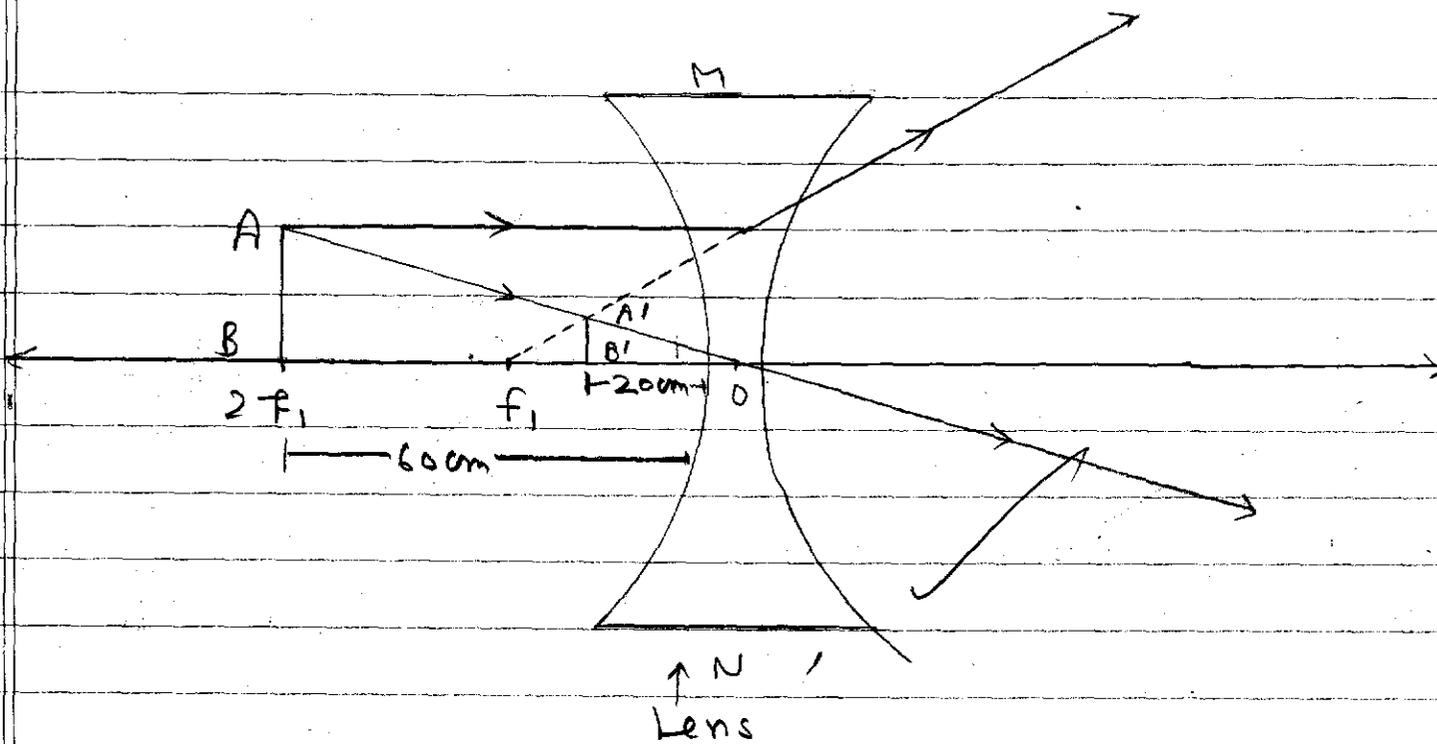
Ray diagram to indicate the distance of image from lens.

P.T.O

Ans- 19. a)

(4½)

1. — Fallopian tube or oviduct
2. — Ovary
3. — Uterus   2½
4. — Cervix
5. — Vagina

b) Contraception refers to the acts to prevent pregnancy.

Advantages of adopting contraceptive measures are :-

(a) To control the population

b) To ~~reduce~~ avoid the ~~unwanted~~ pregnancies.

c) To avoid having many children and reduce family size.

Ans-20. <u>Ethanol</u> is an active ingredient of all alcoholic drinks.

Its chemical formula is CH_3CH_2OH

<u>Uses</u> of Ethanol :-

(a) For making <u>tincture-iodine</u>.

b) For making <u>tonics, and cough syrups.</u>

(i) $CH_3CH_2OH + Na \longrightarrow CH_3CH_2ONa + H_2(g)$
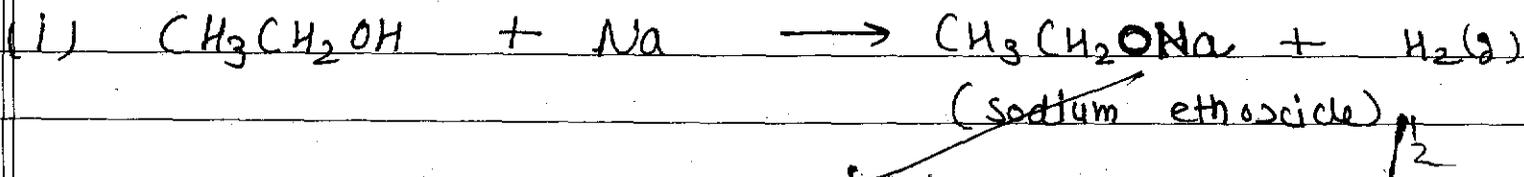
$$\text{(sodium ethoxide)}$$

the product formed is (CH_3CH_2ONa) or sodium ethoxide

(ii) $CH_3CH_2OH \quad \xrightarrow[H_2SO_4]{\text{Hot Conc.}} \quad CH_2=CH_2 + H_2O$
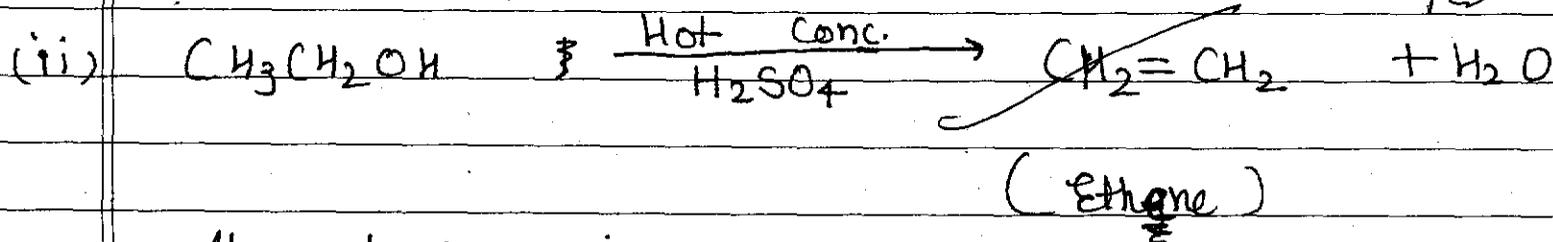
$$\text{(Ethene)}$$

the product is Ethene or $CH_2=CH_2$

Ans-21:- ⑤

| Acids	Bases
a) Acids are sour in taste.	a) Bases are bitter in taste
b) Acids produce $H^+(aq)$ ions in water	b) Bases produce OH^- anions in water
c) Acids turns blue litmus paper into red.	c) Bases turns red litmus paper into blue

Neutralization reaction- The reaction of an acid and a base to produce corresponding salt and water is called neutralization reaction.

i.e. $HCl \, (aq) + NaOH \, (aq) \longrightarrow NaCl \, (aq) + H_2O \, (l)$
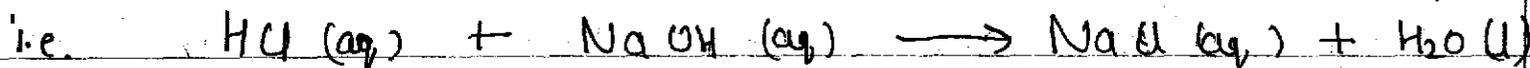
(i) Formation of acidic salts — The reaction of a strong acid and a weak base form a salt which is acidic In nature and water.

i.e. $HCl + NH_4OH \longrightarrow NH_4Cl + H_2O$
(strong acid) (weak base)   (acidic salt)   water
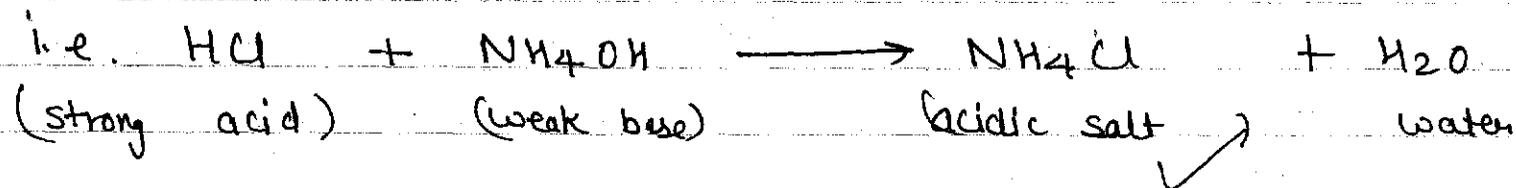
(ii) Formation of basic salts — The reaction of a weak acid and strong base to form a salt which is basic in nature and water.

i.e. — $NaOH + CH_3COOH \longrightarrow CH_3COONa + H_2O$
(Strong base) (weak acid)   (basic salt) (water)
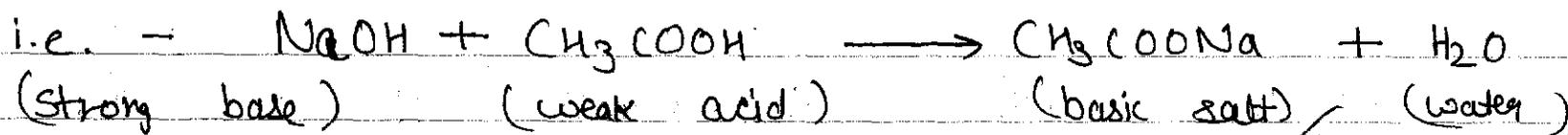
(iii) Formation of neutral salts — The reaction of a strong acid and strong base or weak acid and weak base form a neutral salt and water.

i.e $NaOH + HCl \longrightarrow NaCl + H_2O$
(Strong base)   (Strong acid)   (Neutral salt)   (water)
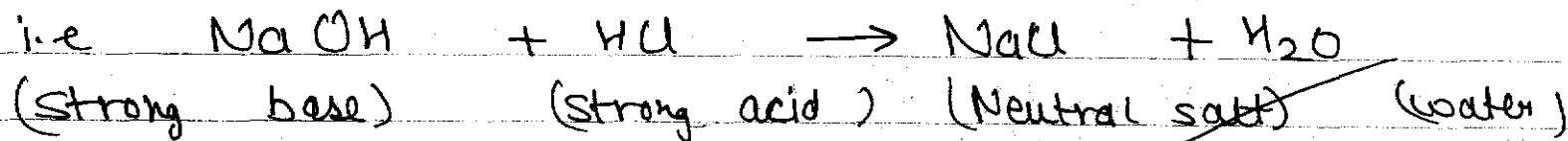
Section - 'E'

Ans-22. The subtance taken in small test tube is KOH solution.

It absorbs the CO_2 produced during respiration

Due to it, the vaccum is created in test tube. And, to eliminate this vaccum, water level rises in bent glass tube.

Ans-23   Chloroplast

Nucleus

Epidermal cells

Stomatal pore

Guard cells
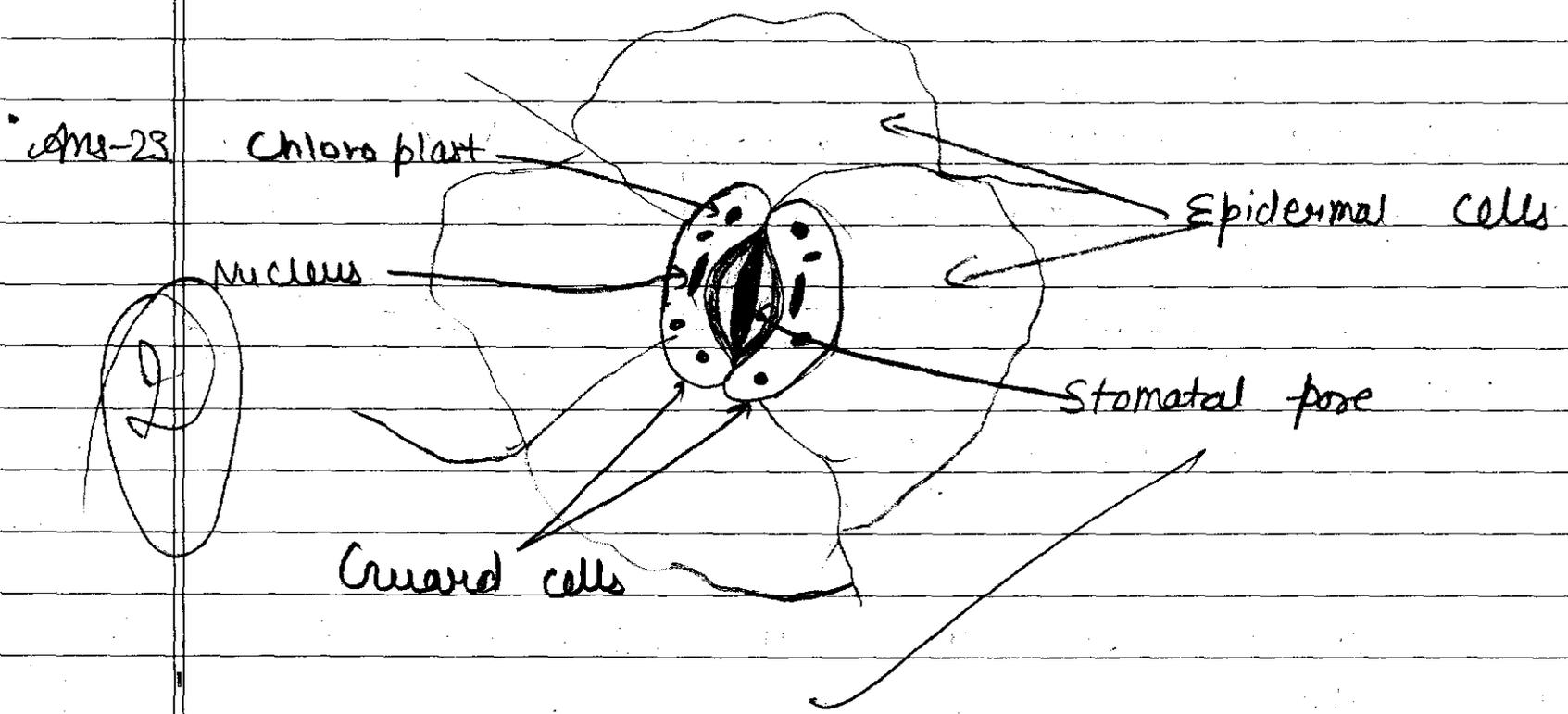
Structure of Stomata

P.T.O

Ans - 24 :- ② The precautions that should be taken while determining the focal length of a convex lens are following —

(a) The uprights should be vertically placed.

b) The measurement scale should be placed horizontally and carefully.

c) A sharp image of distant object should be formed on screen.

d) The lens and screen holder should be properly placed.

Ans-25. The straight line signify that the potential difference (V) across the resistor and the current (I) through it are related to each other by a constant.

(?)

This constant is called the resistance of resistor.

The resistance of the resistor can be determined by dividing the current (I) from potential difference (V). Many sets of $\frac{V}{I}$ should be taken and then their average gives us resistance

Mathematically, $R = \dfrac{V}{I}$

$$R_M = \dfrac{R_1 + R_2 + R_3 + R_n}{n}$$

where,

R_m is total resistance.

Ans 26. The length of fram or lather will be longest in test tube A and test tube B. This is because underwater underground water contain ions and when more calcium sulphate is dissolved in it, it become more difficult for soap to form lather.

∴ The length of foam will be longest in test tubes A and B.

P.T.O

ans-27. When dilute hydrochloric acid is added to sodium carbonate then a gas with effervescence is produced along with water and a salt.

(2) Chemical equation —

$$HCl_{(aq)} + Na_2CO_3 \longrightarrow NaCl + H_2O_{(l)} + CO_{2\ (g)}$$

(hydrochloric acid)   (Sodium Carbonate)   (Sodium chloride) (water) (Carbon dioxide)

$\frac{79}{80}$

$78.5 = 78$

$\frac{79}{80}$