

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 : WEDNESDAY, 13.03.2019

उत्तर देने का माध्यम

Medium of answering the paper : ENGLISH

प्रश्न पत्र के ऊपर लिखे

कोड को दर्शाएँ :

Write code No. as written on  
the top of the question paper :

Code Number

31/1/3

Set Number

①  ②  ③  ④

अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या

No. of supplementary answer -book(s) used

348012  
1

विकलांग व्यक्ति :

Person with Disabilities :

हाँ / नहीं

Yes / No

NO

किसी शारीरिक अक्षमता से प्रभावित हो तो संबंधित वर्ग में  का निशान लगाएँ।  
 If physically challenged, tick the category

B  D  H  S  C  A

B = दृष्टिहीन, D = मूँक व डधिर, H = शारीरिक रूप से विकलांग, S = स्पास्टिक  
 C = डिस्लेक्सिक, A = ऑटिस्टिक

B = Visually Impaired, D = Hearing Impaired, H = Physically Challenged  
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क्या लेखन - लिपिक उपलब्ध करवाया गया : हाँ / नहीं

Whether writer provided : Yes / No

यदि दृष्टिहीन हैं तो उपयोग में लाए गये

सोफ्टवेयर 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, write first 24 letters.

कार्यालय उपयोग के लिए  
 Space for office use

1645532

086 / 14899



## **Instructions to Candidates**

1. Make sure that the answer-book contains 32 pages and are properly serialised 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 answer-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
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केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली  
 Central Board of Secondary Education, Delhi  
 SECONDARY SCHOOL EXAMINATION (CLASS X)  
 सैकंडरी स्कूल परीक्षा (कक्षा दसवीं)

Q. No.	01	02	03	04	05	06	07	08	09	10	TOTAL
MARKS	01✓	01✓	02✓	02✓	02✓	03✓	02✓	03✓	02½	03✓	$22\frac{1}{2}$ = 22½
Q. No.	11	12	13	14	15	16	17	18	19	20	TOTAL
MARKS	03	03	03	03	03	05	05	05	05	05	40 = 40
Q. No.	21	22	23	24	25	26	27	28	29	30	TOTAL
MARKS	05	02	02	02	02	01	02				16 = 16
Q. No.	31	32	33	34	35	36	37	38	39	40	TOTAL
MARKS											
											GRAND TOTAL
											$78\frac{1}{2} = 79$ (79)
											MARKS IN WORDS Eighty only Seventy nine only (11)

प्रमाणित किया जाता है कि मैंने दस अंतर परिक्षा का मत्यांकन लचित प्रश्नपत्र के सेट और अंकन योजना के अनसार किया है। यह श्री प्रमाणित किया जाता है कि अंतर परिक्षा के अन्दर कोई

### SECTION - A

Ans 1. I would prefer L.P.G. (Liquified Petroleum Gas).  
 Reason: It has high calorific value, easily available, does not produce smoke and residue on burning.

Ans 2. Function of Voltmeter: It is used to measure the potential difference across the end of resistor and it is connected in parallel with resistor in a circuit.

### SECTION - B.

Ans 3. There is no change in the image distance in the normal eye  
 Justification: In normal human eye, image is always formed on a light sensitive screen called Retina.

Since Retina is fixed, image forms on retina, it doesn't matter where the object is.

Hence, Image distance in case of human eye is independent from object distance.

Ans 4 (Q2) Pancreas perform dual function in our body:-

- Helps in digestion: Pancreas secrete pancreatic juice which contain enzymes like trypsin which digest protein and lipase which help in the digestion of emulsified fat.
- Regulate Blood sugar level: Pancreas secrete a hormone called insulin which regulate the sugar level in blood.

Ans 5 (Q2) Electronic configuration: 2 8 4

- Group - 14 (since it has 4 electrons in outermost shell)
- period - 3 (since it has 3 shells)

(b) Name - The element is silicon.

physical property : It has both the properties of metal and non-metal.

⇒ It is a semi-conductor.

⇒ It is shiny in appearance.

### SECTION - C

Q3

Ans 6. We can help in reducing the problem of waste disposal by using following methods :-

1. Biogas plant : The organic waste should be used in Biogas plant for production of biogas and manure.

2. Recycling of Non-biodegradable waste : Waste such as paper, plastic, glass, metallic material should be recycled for making required things instead of synthesizing or

extracting fresh resources.

3. Compost pit : We should dump the organic waste under soil for few months. The micro-organisms convert the waste into manure.

(2)

~~Ans.~~ (i) Sustainable management : It is a step initiative which ensure that development must be in such a manner that it does not lead to environmental contamination.

Also, preserving resources for future use.

Advantage : (i) It maintain / meet the current as well as future needs.

(ii) It ensure equal distribution of resources.

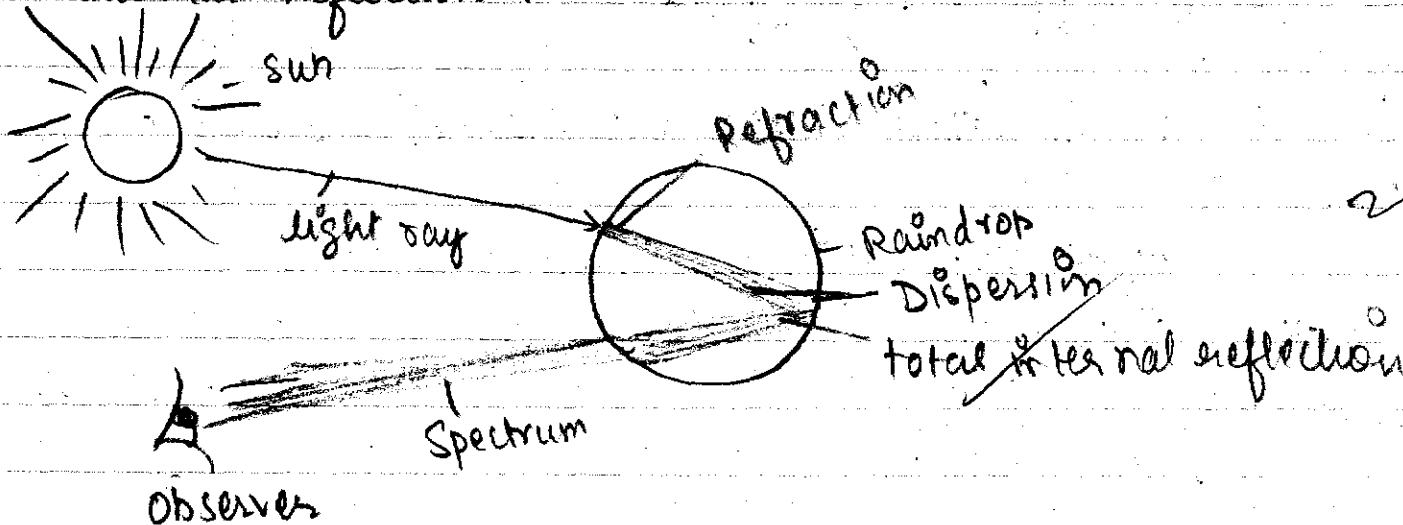
(iii) It ensure the existence of resources over long period of time.

- Ques. 8. (i) (a) It fulfills our current need. 2  
 (b) It buys time for replenishment of resources. 2  
 (c) It leads to development ~~present~~ 2

Ans. 8. Rainbow : It is a natural spectrum forms in the sky after rain shower.

~~Ques. 8.~~ There are 3 phenomenon which are responsible for formation of Rainbow.

- (i) Refraction
- (ii) Dispersion
- (iii) Total Internal Reflection



(02/2)

~~Qns 9. Nervous and hormonal system together perform the function of control and co-ordination in human beings.~~

- ⇒ Human beings perform various activities for survival like digestion, respiration, excretion, transportation etc and for the proper functioning of these activities, control and co-ordination is must.
- ⇒ In human being control and co-ordination is exercise by nervous system. And Endocrine system which use hormone to exercise control and co-ordination.

To justify the above statement, let us take one example.

- ⇒ If we are thirsty, the brain through nervous system create an urge to drink water and when we drink enough, the hormone ADH plays an important role in the formation of urine.
- ⇒ In case of emergency, the external stimuli detected by nervous system transfer the information to brain and at the same time

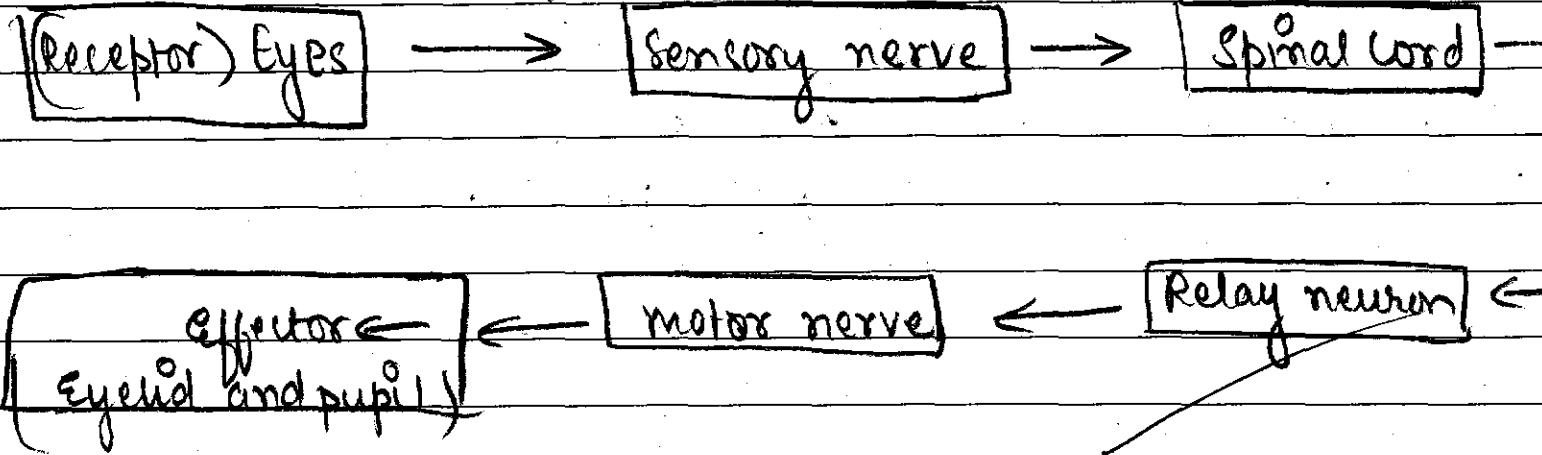
Adrenal gland release the hormone adrenaline which prepare the body for violent action and to deal with situation.

Ans to Q1) When a bright light is focused in our eyes, then it is detected by the photoreceptor present in the eye.

(i) The receptor convey the information to the dendrites of the neuron attached to it which convey the message to axon via cell body in the form of electrical signal called nerve impulse.

(ii) The information is carried to the spinal cord through sensory nerves. The response generated by spinal cord reaches to the eye lid through motor nerves.

(iv) A Eye lids closes the eye and size of pupil shrinks to avoid extra entering of extra light.



Sequence of events.

03

~~Ans 3. Photosynthesis :- It is the process by which autotrophs (mainly green plants) make / synthesize their own food with the help of inorganic substances like  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  etc. in the presence of sunlight trapped by Chlorophyll pigment present in leaf.~~

⇒ In Photosynthesis, there are three main steps that occur :-

(i) Conversion of solar energy into chemical energy.

⇒ Solar energy is trapped by chlorophyll present in leaf.

(ii) Splitting of

(i) Absorption of solar energy.

Solar energy is trapped by chlorophyll molecules present in the cell organelle called chloroplast in leaf.

(ii) Conversion of solar energy to chemical energy and splitting of water molecules taken by root hair and transported by xylem to leaves into hydrogen and oxygen.

(iii) Conversion of carbon dioxide into carbohydrates.

The stomata present in lower epidermis of leaf help in exchange of gases. The carbon dioxide in the

process of photosynthesis get converted to a complex molecule carbohydrate ( $C_6H_{12}O_6$ ).

(03)

$\text{TT}$   $\text{TT}$   
 $\text{Tt}$

Ques 12. ~~Plant used by mendel for experiment : Pea plant (*pisum sativum*)~~

Progeny obtained in  $F_1$  generation : ~~All plants were tall (Tt)~~  
and were heterozygous.

$\frac{1}{2}$   $\text{TT TT Tt Tt}$

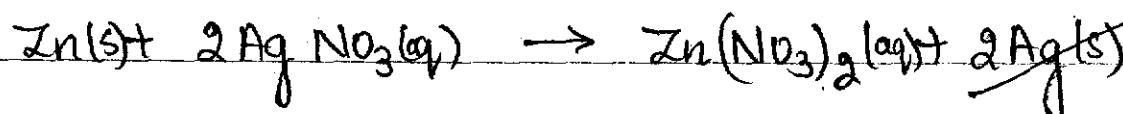
progeny obtained in  $F_2$  generation : Both tall and dwarf plant are obtained.

The Ratio obtained in  $F_2$  generation : Phenotypic ratio - 3 : 1  
- ( 3 tall plants and one short plant ).

Genotypic ratio - 1 : 2 : 1 ( 1 - TT (homozygous) 2 - Tt (heterozygous)  
( 1 - tt homozygous )

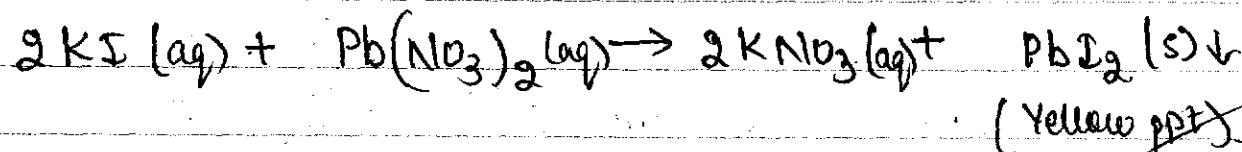
Ans 13 (a) Zinc + Silver nitrate  $\rightarrow$  Zinc Nitrate + Silver

(Q3)



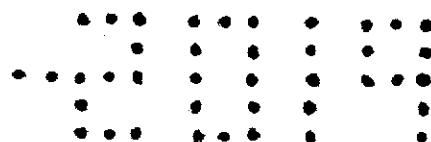
Type of Reaction : Displacement reaction (as Zinc is highly reactive than silver, displaces silver from silver nitrate solution).

(b) Potassium iodide + Lead nitrate  $\rightarrow$  Potassium nitrate + Lead iodide.



(Yellow ppt.)

Type of reaction : Double Displacement Reaction



Ans 11) (i) Oxide of 1st group.

(B)

Molecular formula :  $M_2O$  ( $M$  is an element of group 1).

Justification :

Since  $M$  is in group 1, it has 1 electron in its outermost shell. Hence its valency is 1. so it form  $M_2O$  oxide.

(A)

(ii) The element is in group - 13.

That means it has 3 electrons in its outermost shell. so its valency is 3. because it lose 3 electron to complete its octet and become stable. it forms cation.

formula :  $MR_3$  ( $M$  is an element of group 13).

Ques (iii)

Element A - Group 2

Mg (L<sub>2</sub>)

Element B - Group 17.

Electronic configuration of A = ~~K L~~ 2, 2

Compound : A<sup>+2</sup> B<sup>-1</sup>  
                  2      1  
                 AB<sub>2</sub>

Justification : Since A is in group 2, it has 2 valence electron and it lost its 2 electron to complete its octet. Hence its valency is 2.

Since B is in group 17, it has 7 valence electron and it gain 1 electron to complete its octet, Hence its valency is 1.

So, the compound formed is AB<sub>2</sub>.

Q3

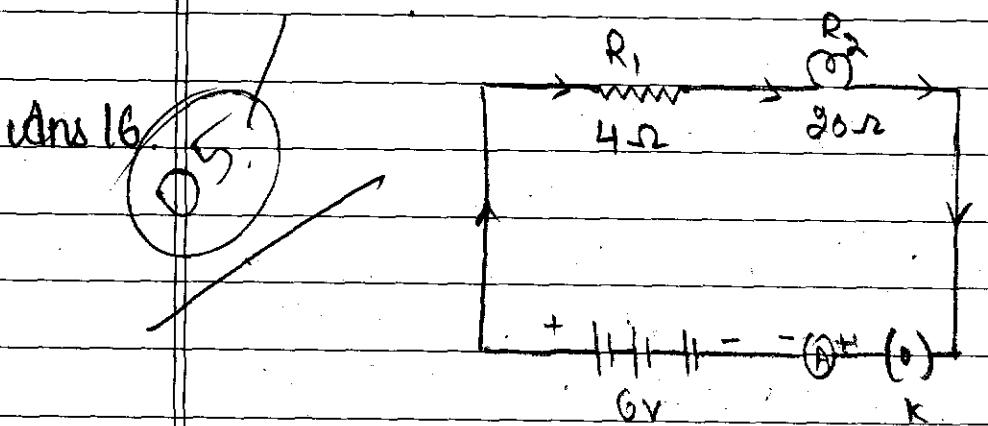
~~Ans.~~ (a) Sodium chloride conduct electricity in molten and aqueous solution because, sodium chloride is an ionic compound which is formed by the transfer of electrons. In solid state they do not contain ions but in molten and aqueous solution they dissociates and form  $\text{Na}^+$  and  $\text{Cl}^-$  ions. and we know that a solution containing ions conduct electricity.

(b) Reactivity of aluminium decreases if it is dipped in nitric acid because nitric acid is a strong oxidising agent. It oxidises the Hg produced in water and itself reduced to any of its Oxides  $\text{NO}_2$ ,  $\text{N}_2\text{O}$  etc. Hence Aluminium is not able to displace hydrogen from  $\text{HNO}_3$  (Nitric acid), its reactivity decreases.

(c) Metal like calcium and magnesium are occupy the top space of reactivity series, hence they are highly reactive metal.

They react with other elements to complete their octet  
and are not found in free state.

### SECTION - D

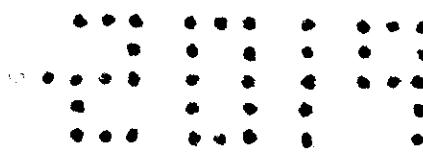


Given: Lamp has resistance  $20\Omega$

Conductor has resistance  $4\Omega$

Connected to Battery of 6 V.

To calculate:



(a) The total resistance of circuit.

Since the lamp and conductor are connected in series, the equivalent resistance is equal to the sum of individual resistance i.e.

$$R_s = R_1 + R_2$$

$$R_s = (4 + 20) \Omega$$

$$R_s = 24 \Omega$$

Total resistance =  $24 \Omega$

(b) current through circuit

According to ohm's law

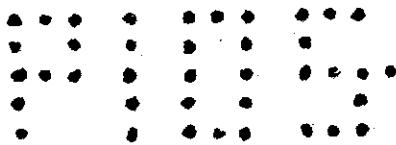
$$V = I \cdot R \quad (V = 6V, R = 24 \Omega)$$

$$6 = I \cdot 24$$

$$\frac{6}{24} = I$$

$$0.25 A = I$$

$\frac{0.25}{4}$



$$\text{Current} = 0.25 \text{ A.}$$

(c) Potential difference across  $\text{Lamp}$

(i) electric lamp

Acc. to Ohm's law (current remain same in series connection)

$$V = I \cdot R$$

$$V = 0.25 \times 20$$

$$V = 500$$

$$V = 5v.$$

Potential difference across lamp = 5v.

(ii) conductor

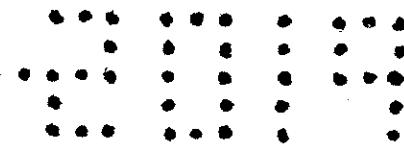
$$V = I \cdot R$$

$$V = 0.25 \times 4$$

$$V = 1.00$$

$$V = 1v$$

Potential difference across conductor is 1v.



(d) Power of lamp.

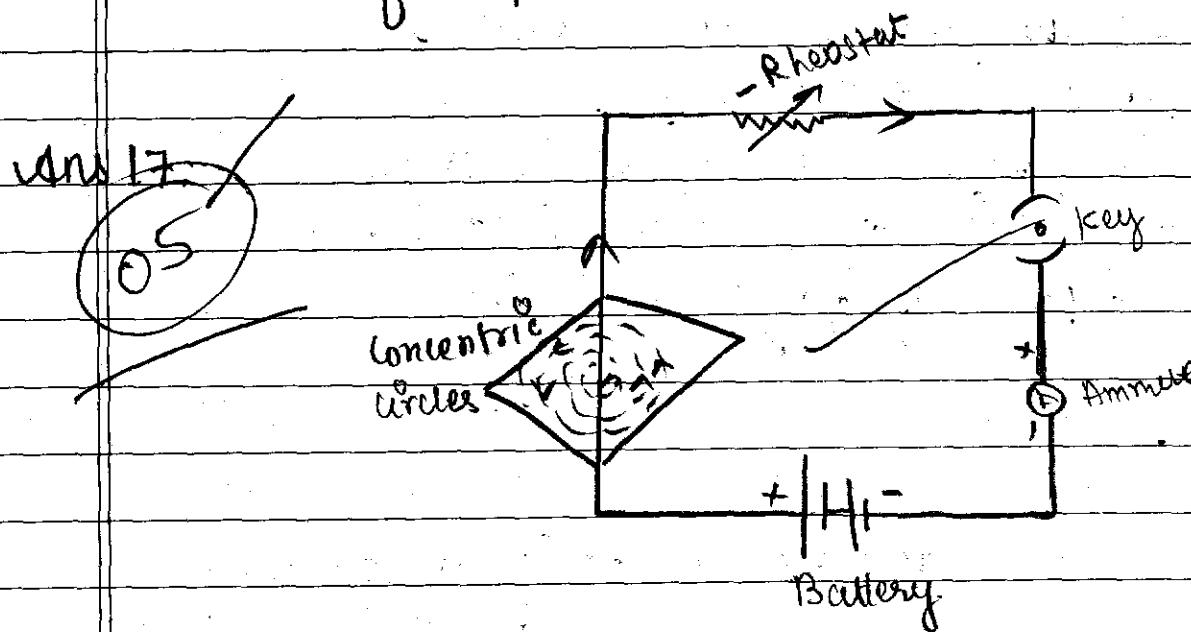
Power of lamp = Potential difference across lamp  $\times$  current

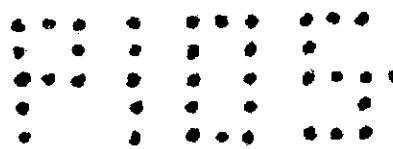
$$P = V \cdot I$$

$$P = 5 \times 0.25$$

$$P = 1.25 \text{ W}$$

Power of lamp = 1.25 W.





Name of the rule : Maxwell's Right hand thumb rule

Statement : Maxwell's right hand thumb rule states that if a current carrying conductor is held in the right hand in such a way that thumb points towards the direction of current then the direction in which fingers encircle is the direction of magnetic field.

Application : In the diagram above, the current flowing in upward direction, if we held the wire in such a way thumb points in upward direction which is the direction of current then the direction of magnetic field is anticlockwise as it is same as the direction of fingers encircling.

- Ques** (b). \* The magnetic field will decrease as point moved away from conductor.

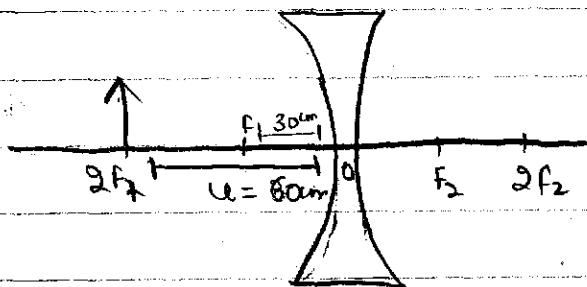
~~Justification:~~ The strength of magnetic field is determined by the closeness of magnetic field lines of force.

Since there are closed near the wire, the strength of magnetic field increases.

But as distance increases from conductor, magnetic field lines goes far to each other which decrease the strength of magnetic field.

Ques. 18

05

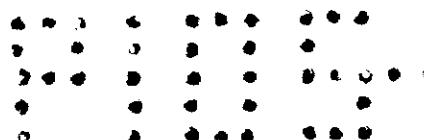


Type of lens: concave lens.

$$u = -60\text{cm}$$

$$f = -30\text{cm}$$

(i) To find distance of image.



$$\text{lens formula} = \frac{1}{f} = \frac{1}{V} - \frac{1}{U}$$

$$\frac{1}{-30} = \frac{1}{V} - \frac{1}{-60}$$

$$\frac{1}{-30} - \frac{1}{-60} = \frac{1}{V}$$

$$\frac{1}{-30} - \frac{1}{60} = \frac{1}{V}$$

$$\frac{60 + 30}{-1800} = \frac{1}{V}$$

$$\frac{1}{20} - \frac{1}{1800} = \frac{1}{V}$$

$$V = \infty - 20 \text{ cm.}$$

Image formed 20 cm  $\text{in}^{\circ}$  front of lens.

(ii)

$$m = \frac{v}{u} = \frac{f_2 D}{f_1 D} = \frac{1}{3}$$

$\frac{1}{2}$

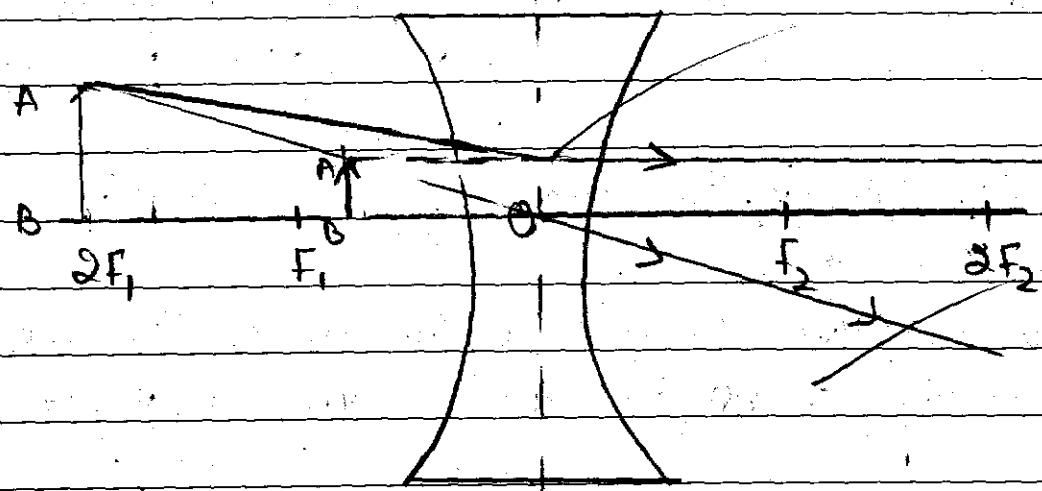
Characteristics of image:

Nature: Virtual

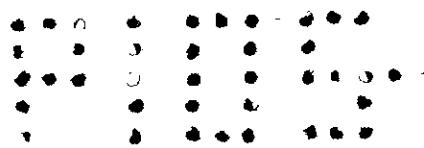
Position: Same side of lens.

Size: Smaller than object

Erect



A'B' - Image.



Ans 19 (a)

- 1 - fallopian tube or oviduct ✓  $\frac{1}{2}$
- 2 - ovary ✓  $\frac{1}{2}$
- 3 - Uterus ✓  $\frac{1}{2}$
- 4 - Cervix ✓  $\frac{1}{2}$
- 5 - vagina. ✓  $\frac{1}{2}$

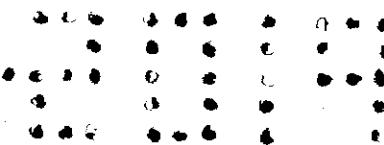
(b) ~~Q5~~

The diagram is of female Reproductive System.  $\frac{1}{2}$

(b) Contraception: The process of preventing pregnancy is called  $\frac{1}{2}$  contraception.

Three advantages of contraceptive measure

(i) Using various contraceptive devices like condom during copulation prevent sexually transmitted diseases like AIDS etc to a great instant.  $\frac{1}{2}$



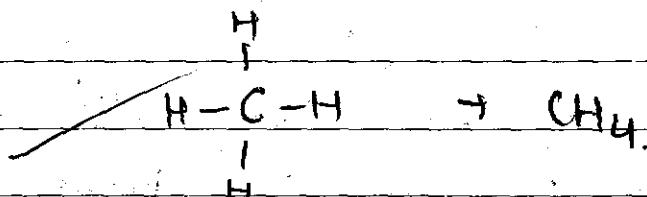
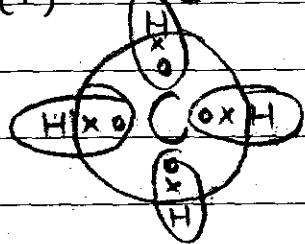
- (ii) It is important for birth and population control. ½
- (iii) It helps to prevent unwanted pregnancies. ½
- (iv) It helps in family planning for not having more than 3 children.

Ans 20. Methane : Methane is a <sup>saturated</sup> hydrocarbon which has single bond between carbon atom and hydrogen atom. 2

OS

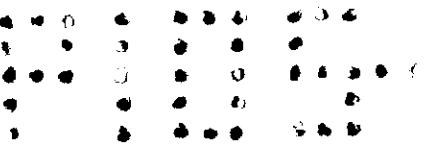
Carbon (6)  $\rightarrow$   $\frac{2}{2}, \frac{4}{4}$

Hydrogen (1)  $\rightarrow$   $\frac{1}{1}$



Electron dot structure of Methane ( $\text{CH}_4$ ).

$\Rightarrow$  This compound has covalent single bond between carbon and hydrogen atom. 2



(i) Poor conductor of electricity

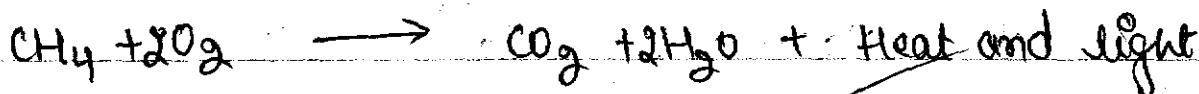
I<sup>o</sup>valent compound are formed by sharing of electrons, hence they do not contain ions.

So, due to the absence of ions, covalent compounds are poor conductor of electricity.

(ii) Have low melting and boiling points.

They have low melting and boiling points because the force of attraction between the atoms is not so strong, so, small amount of heat energy is sufficient to break the bonds.

(iii) When this compound burn : This compound burns with clean blue flame and produce carbon dioxide, water vapour along with large amount of heat and light.



~~Ans 21~~ Difference between acid and base.

(i)

Acid

Base

- (i) Acid produce  $\text{H}^+$  ions in water solution. Bases produce  $\text{OH}^-$  ions in solution.

- (ii) They turn red litmus to blue. They turn red litmus to blue.

Ex. HCl,  $\text{H}_2\text{SO}_4$ .

Ex, NaOH, KOH etc.

Neutralisation : The reaction between an acid and base to produce salt and water is called neutralisation reaction. The acid and base neutralise the effect of each other.



Acid + Base  $\rightarrow$  Salt + water

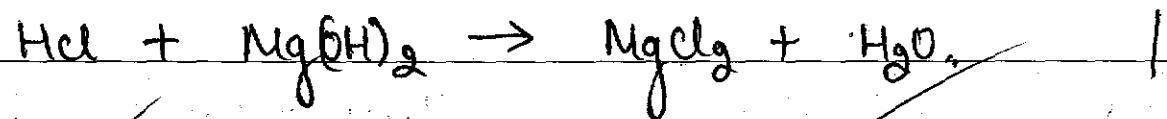
(i) Example : (i) HCl + NaOH  $\rightarrow$  NaCl + H<sub>2</sub>O.

(ii) HCl + KOH  $\rightarrow$  KCl + H<sub>2</sub>O.

### (i) Acidic salt

The acidic salt form when strong acid react with mild base.

Ex.

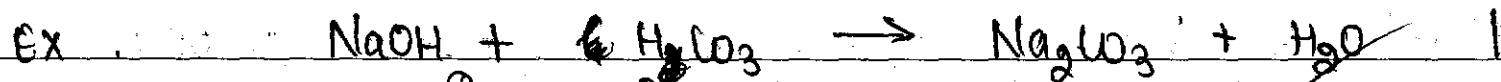


MgCl<sub>2</sub> is acidic salt.

### (ii)

### Basic salt

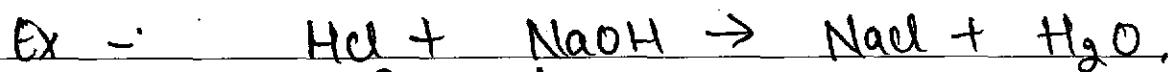
The basic salt is form when strong base react with weak acid.



Na<sub>2</sub>CO<sub>3</sub> is a basic salt.

## (iii) Neutral salt

\* When strong acid react with strong base then neutral salt will form.



NaCl is neutral salt.

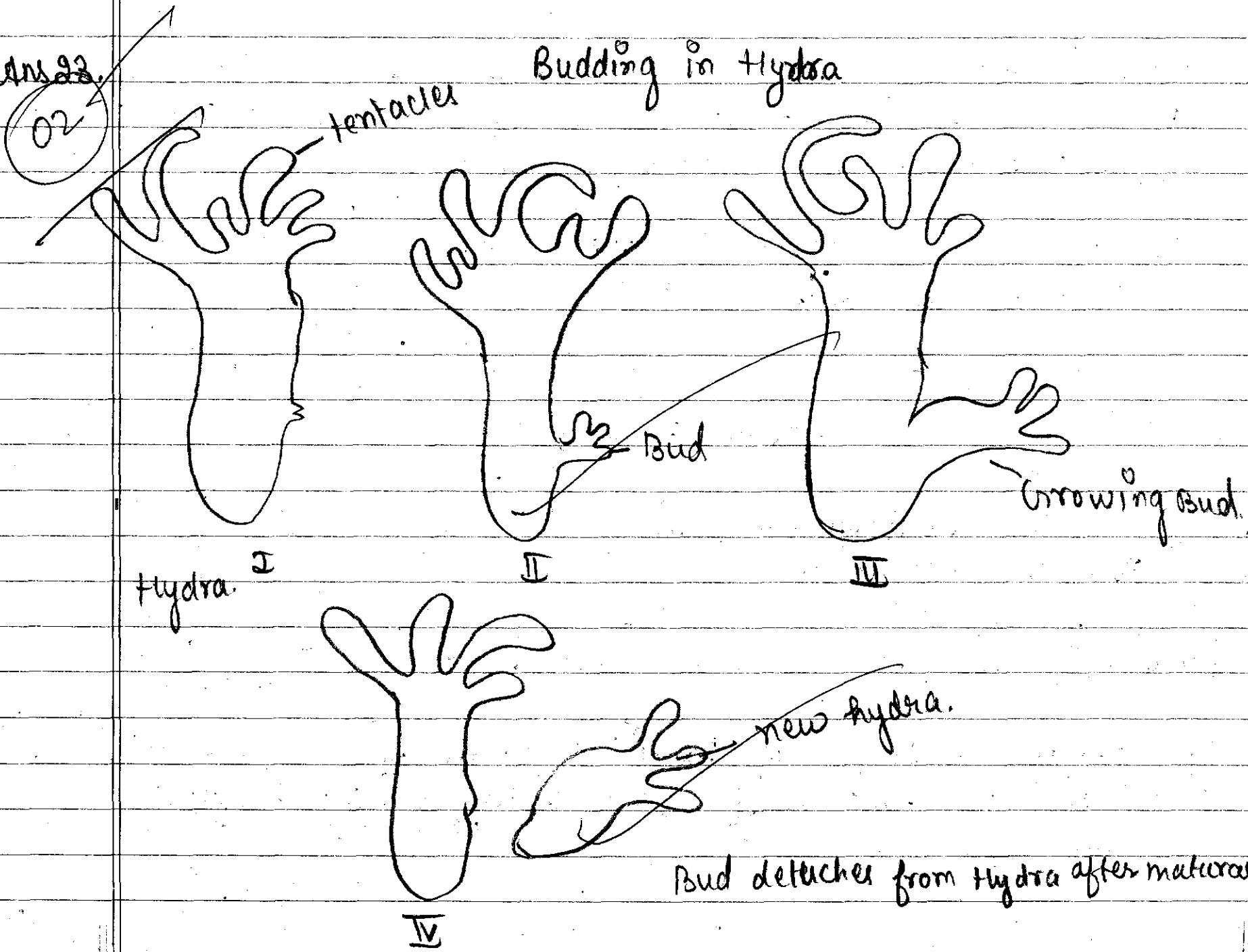
## SECTION - E

~~cone~~ ~~gas~~. The substance taken in small test tube is KOH  
~~O<sub>2</sub>~~ Potassium hydroxide.

Function : It act as CO<sub>2</sub> absorber.

Consequence : It make partial vacuum in conical flask.  
 To eliminate this difference water in the beaker level goes up.

Ans 23



Q2

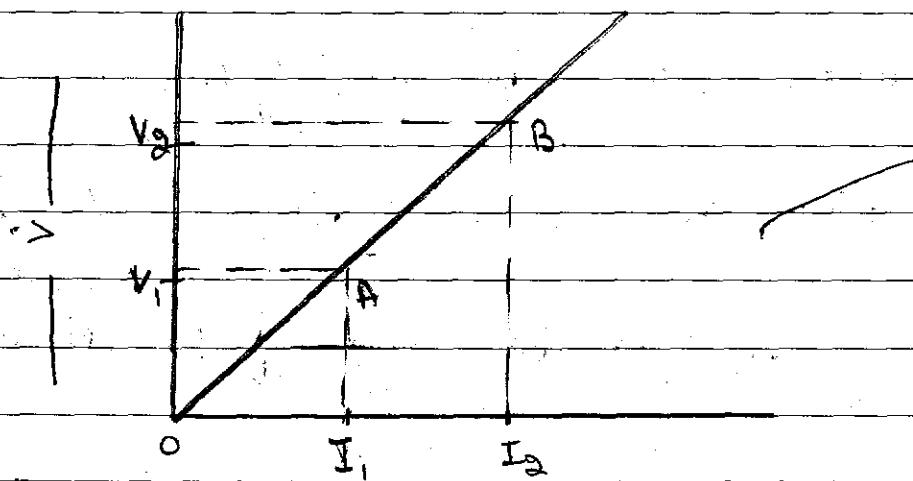
- ~~Ans Q2.~~ (a) <sup>Clearly</sup> The object should be visible by naked eye.  $\frac{1}{2}$
- (i) The lens should be new and clear.  $\frac{1}{2}$
- (ii) The screen should be on focus.  $\frac{1}{2}$
- (iv) Measure the distance carefully.  $\frac{1}{2}$
- (v) Light rays should be come parallel to principal axis.

~~Q2~~ The straight line show the independence of potential difference across a resistor on current I passing through it.

It shows that potential difference is directly proportional to current flowing through it.

$V \propto I$

Let us take the graph for example.



Slope AB is resistance.

$$V = I \cdot R \quad (\text{Ohm's law})$$

$$\frac{V}{I} = R$$

$$\frac{V_2 - V_1}{I_2 - I_1} = AB$$

0901

Fictitious Roll No.  
(To be entered by Board)

{ अपना अनुक्रमांक इस उत्तर-पुस्तिका  
पर न लिखें  
Please do not write your  
Roll Number on this Answer-Book

{ अतिरिक्त उत्तर-पुस्तिका(ओं) की संख्या 348012  
Supplementary Answer-Book(S) No. 348012

(H) 1530

- Ans 26.
- A - Distilled water
- B - Underground water
- C - Distilled water

OK

Calcium Sulphate is dissolved.

Equal amount of soap added.

The length of foam will be longest in A and C as they contain distilled water with  $\text{CaSO}_4$ .

But B contains  $\text{CaSO}_4$  and other impurities which make it more harder than the other 2.

Ans 27: Test tube A - HCl

~~02~~ Test tube B - NaOH.

In test tube A will colour change.

The colour will change from Blue litmus to red as HCl is a strong acid.

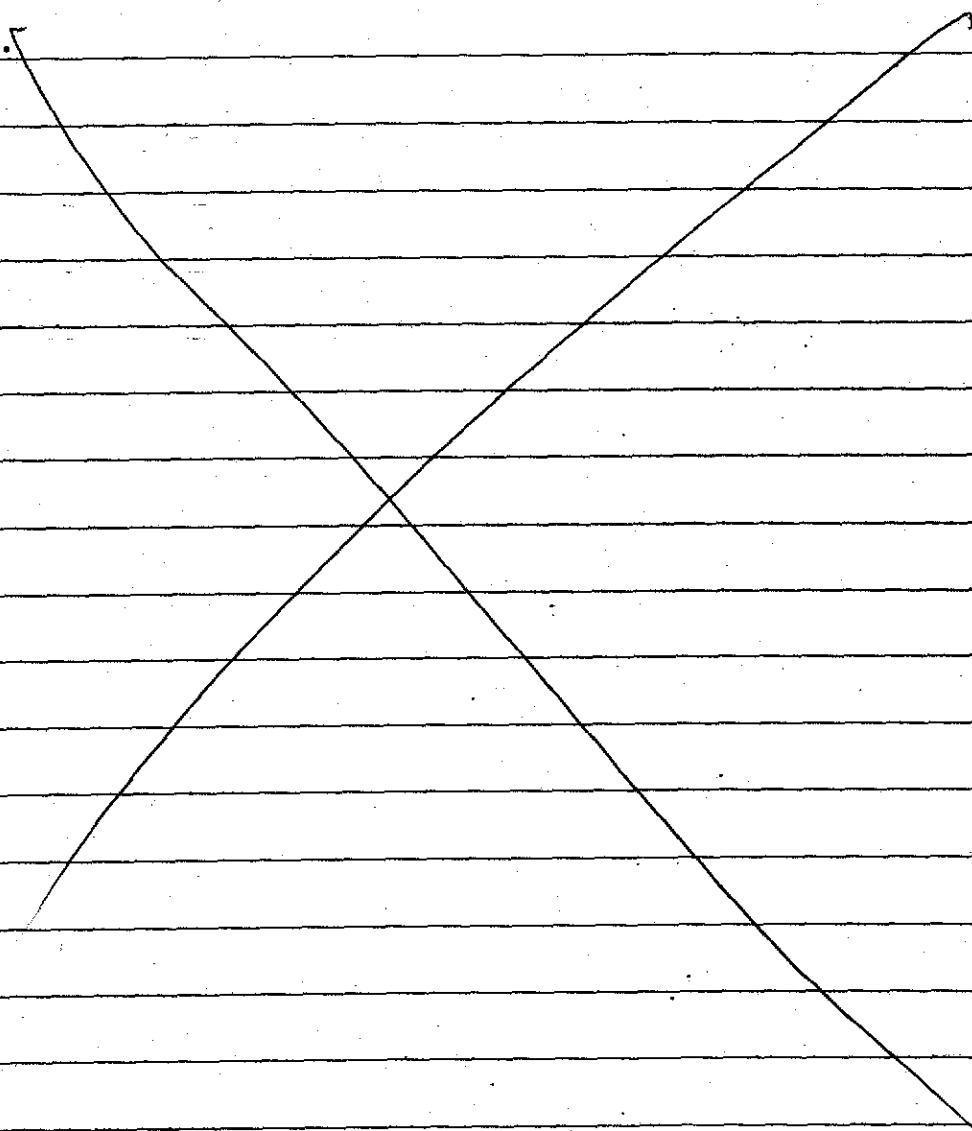
And Acid changes Blue litmus to red.

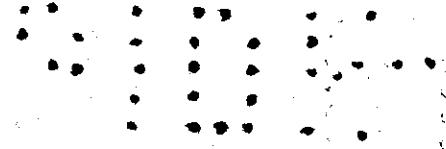
~~79½ = 80~~ eighty only Seventy nine only

~~1. due to 153²)~~

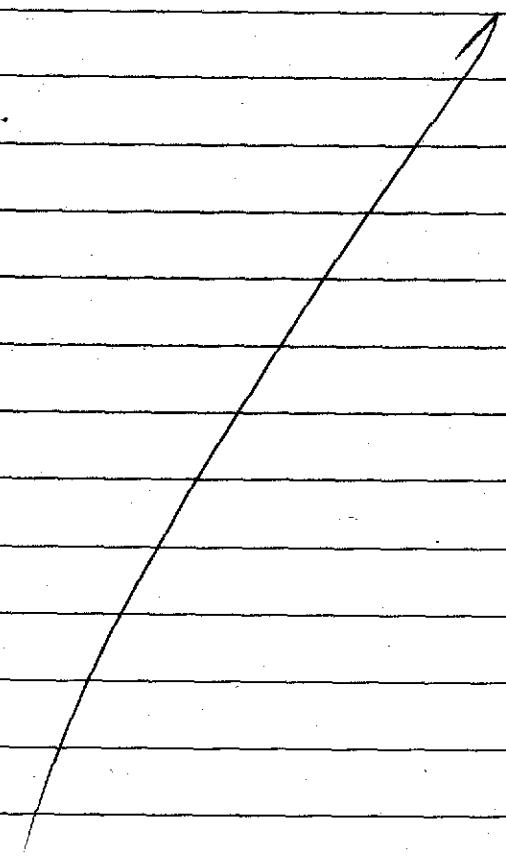
~~78½ + 79~~ 2. due to 153¹¹  
~~80~~ Seven only

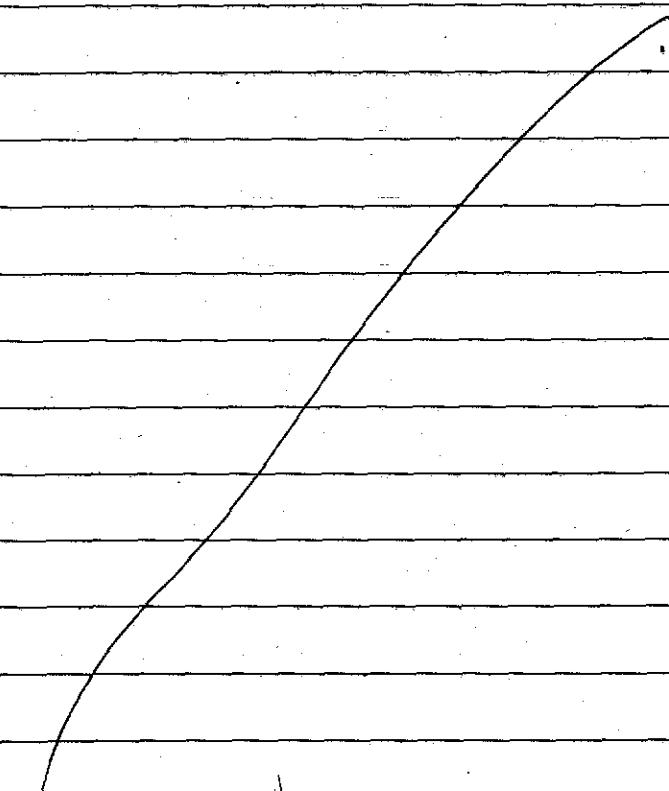
~~seventy nine~~ 3. due to 153⁰¹

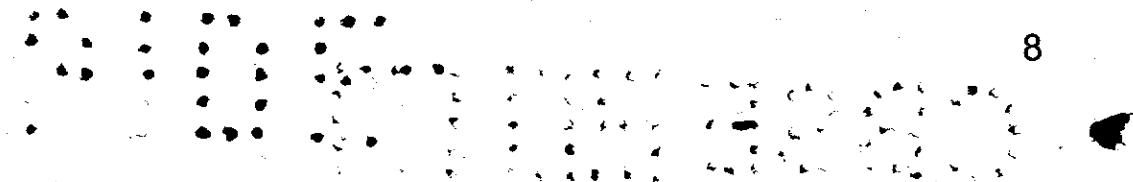












DATA A.

