

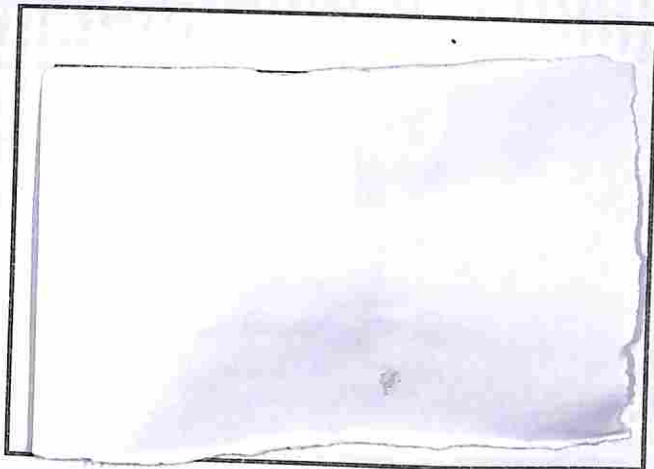




# माध्यमिक शिक्षा बोर्ड, राजस्थान, अजमेर

## माध्यमिक परीक्षा

(परीक्षार्थी द्वारा स्वयं भरा जाना चाहिये)



नोट :- परीक्षार्थी उपरोक्त के अतिरिक्त उत्तर पुस्तिका के अन्य किसी भी भाग में अपना नामांक नहीं लिखें।

माध्यम - हिन्दी ☐ अंग्रेजी ☒

विषय Science

परीक्षा का दिन Friday

दिनांक 21-03-2025

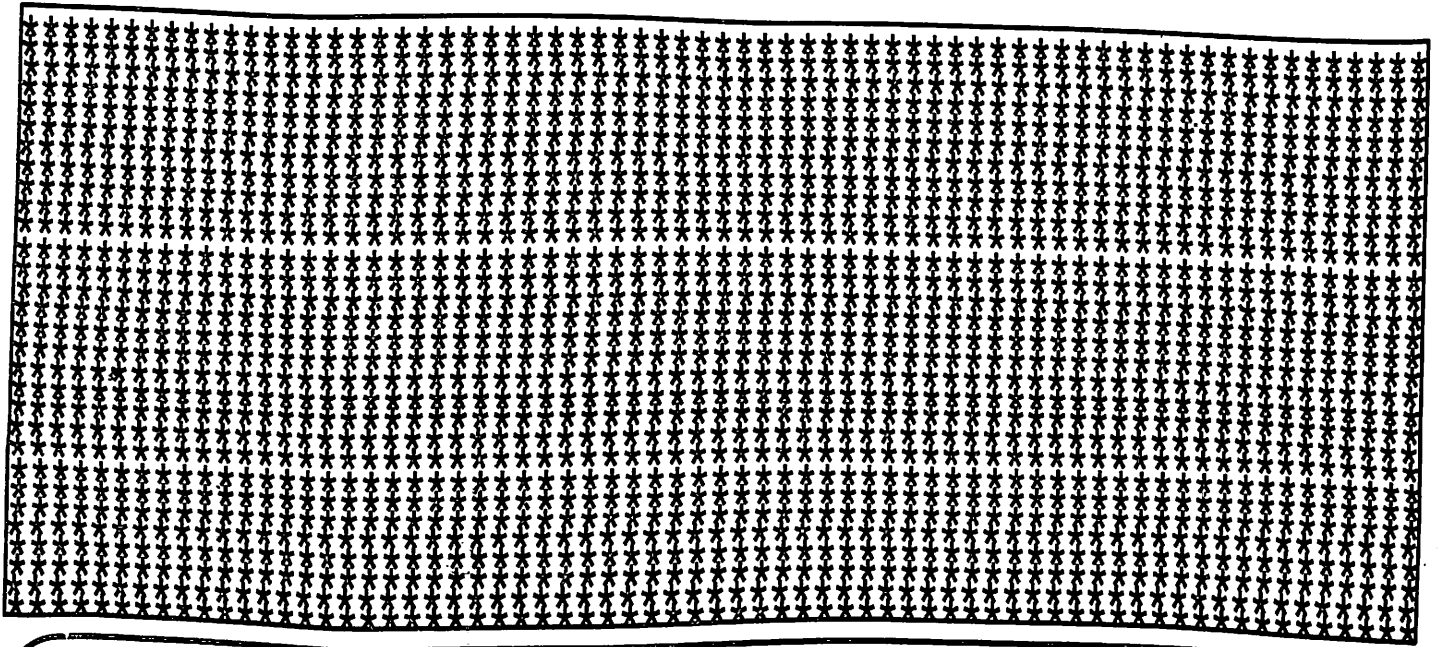
नोट :- परीक्षार्थी के लिए आवश्यक निर्देश इस पृष्ठ के पिछले भाग पर उल्लेखित हैं। जिन्हें सावधानी पूर्वक पढ़ लें व पालना अवश्य करें।

- परीक्षक हेतु निर्देश :- (1) परीक्षक को उपरोक्त सारणी अनुसार प्राप्तांक भरना अनिवार्य हैं, अन्यथा नियमानुसार दंडित किया जायेगा।  
(2) परीक्षक उत्तर पुस्तिका के अन्दर के पृष्ठों के बायीं ओर निर्धारित कॉलम में लाल इंक से अंक प्रदत्त करें।  
(3) कुल योग भिन्न में प्राप्त होने पर उसे पूर्णांक में ही परिवर्तित कर अंकित करें (उदाहरणार्थ: 15  $\frac{1}{4}$  को 16, 17  $\frac{1}{2}$  को 18, 19  $\frac{3}{4}$  को 20)

| प्रश्नवार प्राप्तांकों की सारणी<br>(परीक्षक के उपयोग हेतु) |            |                                         |            |
|------------------------------------------------------------|------------|-----------------------------------------|------------|
| प्रश्नों की क्रम संख्या                                    | प्राप्तांक | प्रश्नों की क्रम संख्या                 | प्राप्तांक |
| 1                                                          | 18         | 19                                      | 4          |
| 2                                                          | 06         | 20                                      | 4          |
| 3                                                          | 12         | 21                                      |            |
| 4                                                          | 2          | 22                                      |            |
| 5                                                          | 2          | 23                                      |            |
| 6                                                          | 2          | 24                                      |            |
| 7                                                          | 2          | 25                                      |            |
| 8                                                          | 2          | 26                                      |            |
| 9                                                          | 2          | 27                                      |            |
| 10                                                         | 2          | 28                                      |            |
| 11                                                         | 2          | 29                                      |            |
| 12                                                         | 2          | 30                                      |            |
| 13                                                         | 2          | 31                                      |            |
| 14                                                         | 3          | योग                                     | 80         |
| 15                                                         | 3          | प्राप्त अंकों का कुल योग<br>(Round off) |            |
| 16                                                         | 3          | अंकों में                               | शब्दों में |
| 17                                                         | 3          | 80                                      | अस्सी      |
| 18                                                         | 4          |                                         |            |

परीक्षक के हस्ताक्षर [Signature] संकेतांक 53117

प्रमाणित किया जाता है कि इस उत्तर पुस्तिका के निर्माण में 60 जी.एस.एम. ईको मैपलिथो कागज ही उपयोग में लिया गया है। 180/2025



### परीक्षार्थियों के लिए आवश्यक निर्देश

1. समस्त प्रश्नों का हल निर्धारित शब्द सीमा में इसी उत्तर पुस्तिका में करना है। विशेष परिस्थिति में अतिरिक्त उत्तर पुस्तिका, उत्तर पुस्तिका भरी हुई होने पर पर्यवेक्षक एवं वीक्षक की अनुशंसा पर ही उपलब्ध कराई जायेगी।
2. प्रश्न-पत्र पर निर्धारित स्थान पर अपना नामांक लिखें।
3. प्रश्न-पत्र हल करने के पश्चात् जिस पृष्ठ पर हल समाप्त होता है, उस पर अन्त में "समाप्त" लिखकर अन्त के सभी रिक्त पृष्ठों को तिरछी लाईन से काटें।
4. निम्न बातों का विशेष ध्यान रखें अन्यथा अनुचित साधनों की रोकथाम अधिनियम के तहत कार्यवाही की जा सकेगी:-
  - (i) उत्तर पुस्तिका के ऊपर/अन्दर तथा प्रश्नोत्तर के किसी भी भाग में चाही गई सूचना के अलावा अपना नामांक, नाम, पता, फोन नम्बर अथवा पहचान की कोई अन्य प्रकार की सूचना आदि अंकित नहीं करें अन्यथा "अनुचित साधनों के प्रयोग" के अन्तर्गत कार्यवाही की जावेगी।
  - (ii) उत्तर पुस्तिका के पृष्ठों को फाड़ें नहीं। उत्तर-पुस्तिका के मुख पृष्ठ पर अंकित संख्या के अनुसार पृष्ठ पूरे होने चाहिये। परीक्षार्थी उत्तरपुस्तिका प्राप्त करते ही पृष्ठ संख्या की जांच कर लें यदि पृष्ठ कम/अधिक या क्रम में नहीं हैं तो वीक्षक से तुरन्त बदलवा लें।
  - (iii) परीक्षा केन्द्रों पर पुस्तक, लेख, कागज, केलक्यूलेटर, मोबाईल, पेजर आदि किसी भी प्रकार का इलेक्ट्रॉनिक उपकरण तथा किसी भी प्रकार का हथियार आदि ले जाना निषेध है।
  - (iv) वस्त्र, स्केल, ज्योमेट्री बॉक्स पर कुछ न लिखकर लावें। टेबल के आस-पास कोई अनुचित सामग्री नहीं होनी चाहिये, इसकी जांच कर लें।
  - (v) अपनी उत्तर पुस्तिका/ग्राफ/मानचित्र आदि परीक्षा भवन से बाहर ले जाना दण्डनीय अपराध है, अतः परीक्षा समाप्ति पर उत्तर पुस्तिका वीक्षक को बिना साँपे परीक्षा कक्ष नहीं छोड़ें।
5. उत्तरों को क्रमानुसार एक ही स्थान पर लिखें। प्रश्न क्रमांक भी सही अंकित करें, अन्यथा दण्ड स्वरूप परीक्षक को उत्तर पुस्तिका के अंतिम पृष्ठों पर करें तथा तिरछी रेखा से काटें।
6. जहाँ तक हो सके प्रश्न के सभी भाग के उत्तर, उत्तर पुस्तिका में एक ही स्थान पर अंकित करें।
7. भाषा विषयों को छोड़कर शेष सभी विषयों के प्रश्न-पत्र हिन्दी-अंग्रेजी दोनों भाषा में मुद्रित हैं। किसी भी प्रकार की त्रुटि/अन्तर/विरोधाभास होने पर हिन्दी भाषा के प्रश्न को ही सही माना जाये।

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SECTION - A

①

(i) Thyroid gland (B)(ii) Plasmodium (A)(iii) Excretion (C)(iv) Cytokinin (D)(v) 1:2:1 (A)(vi) Producers (D)(vii)  $R = 2f$  (C)(viii) Red (A)(ix)  $2\ \Omega$  (B)(x) Silver (D)(xi) Direction of current (A)(xii) ~~To the right (B)~~ Into the page (D)(xiii)  $H_2$  (A)



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(xiv) 7 (B)

(xv) (iii) and (iv) (D)

(xvi) 5 (B)

(xvii)  $C_2H_6$  (c)

(xviii) 4 (A)

18

(2)

(i) A feedback mechanism regulates the action of a hormone.

(ii) The web made by branching food chain is called food web.

(iii) Electric wires are usually made up of copper because of good conducting property.

(iv) By increasing the number of turns of wire in the coil, the strength of magnetic field produced by a current carrying conducting is increasing.

(v) The name of compound obtained by burning of magnesium ribbon in air is Magnesium Oxide.  
(MgO)

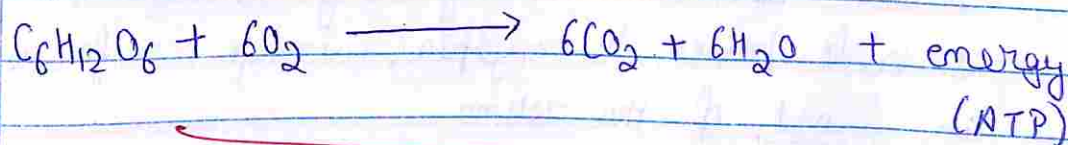
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(vi) Gold is more ductile between gold and iron.

(3)

(i) Respiration is an energy-giving process in which 6-molecules of glucose breakdown into 2-molecules of pyruvic acid in cytoplasm. Then, they enter into mitochondria to produce CO<sub>2</sub>, H<sub>2</sub>O and energy. This energy is stored in the form of ATP (Adenosine Triphosphate). The reaction involved is →



(ii) Cerebellum, the part of hind brain controls walking in a straight line, riding bicycle and picking up a pencil.

(iii) Garden pea or pea plant, whose scientific name is Pisum sativum is an example of bisexual flower.

(iv) In Mendel's experiment, the purple flower is the contrasting character for white flower of pea.

(v) Convex mirror is used as rear-view of a vehicle because it provides large field of view. So that the

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driver can drive properly.

(vi)

In myopia, (near-sightedness), a person cannot see distant (far) objects clearly but can see near objects clearly.

Causes of myopia →

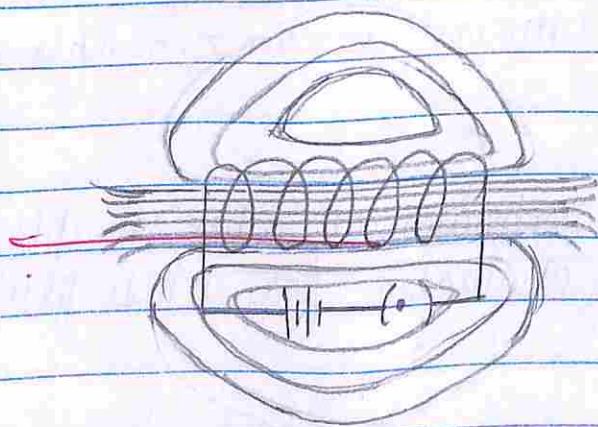
1. Excessive curvature of eye lens.
2. Elongation of eye ball.

It can be corrected by using concave lens of suitable power. In myopia, image is ~~form~~ formed in front of the retina.

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(vii) Voltmeter denoted by  $\text{---}\text{V}\text{---}$  is used to measure potential difference in a circuit. It is always connected in parallel.

(viii)



MAGNETIC FIELD DUE TO THE CURRENT CARRYING SOLENOID.

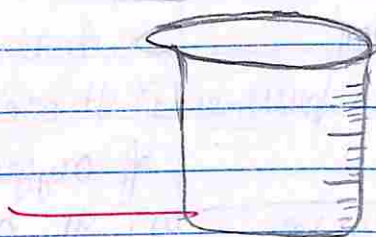


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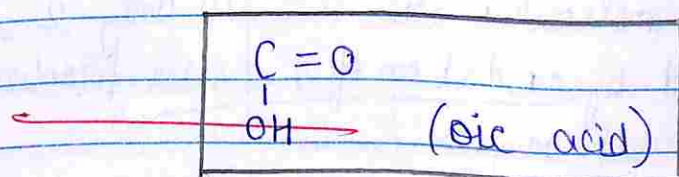
Calcium Hydroxide is 'x' in the given reaction.

(x)

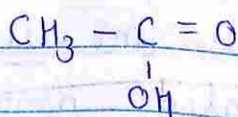


BEAKER

(xi) The functional group present in ~~carboxylic~~ carboxylic acid is 'oic acid'



For example  $\rightarrow$  Ethanoic acid



(xii) By the given experiment, the student has proved that acids release  $\text{H}^+$  ~~in ions~~ in aqueous solution due to which the solution starts conducting

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electricity and the bulb will glow.

### SECTION-B

4

Aerobic respirationAnaerobic respiration

(1) It occurs in the presence of oxygen.

1) It occurs in the absence of oxygen.

(2) It occurs partially in cytoplasm (glycolysis) and partially in mitochondria (Kreb's cycle).

2) It occurs completely in cytoplasm.

(3) In this, complete breakdown of glucose occurs.

3) In this, incomplete breakdown of glucose occurs.

(4) 38 ATP molecules are produced by oxidation of 1 gm mole of oxygen.

4) Only 2 ATP molecules are produced.

②

5 In phototropism, plants show directional growth towards the sunlight. It occurs due to the increased amount of auxin in the root side due to which the roots grow fast causing the plant to bent towards sunlight. So, that the illuminated side of plant can grow fast with the help of sunlight.

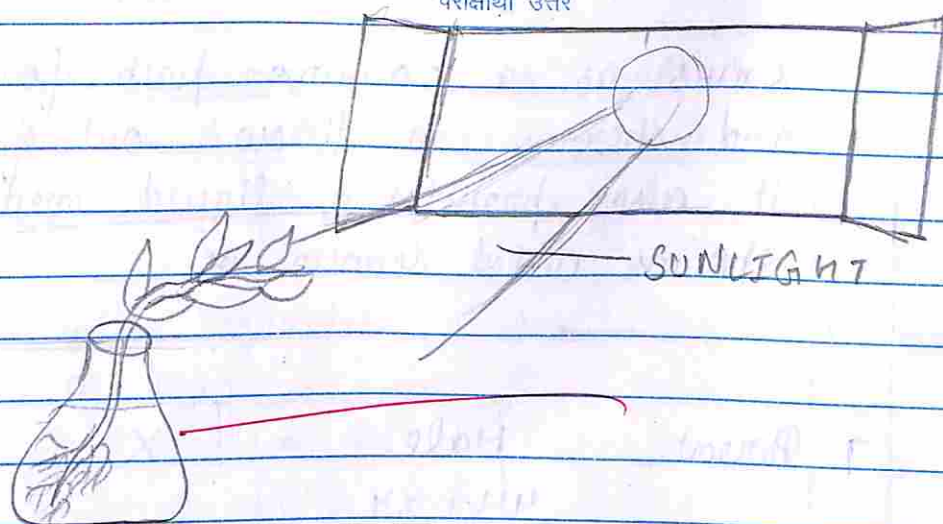
②



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## PHOTOTROPIC MOVEMENT OF PLANT

- 6 The two organs of male reproductive system are →
1. Testis
  2. Seminal vesicle

### Function of Testis →

1. Testis are present in the scrotum of males which is present outside the body because testes needs  $1-3^{\circ}\text{C}$  less than the body temperature to produce sperms.
2. It also secretes testosterone (male sex hormone) which helps in the growth of genital organs and secondary sexual characters like beards, moustache, arm pit hairs, cracking of voice etc.

### Functions of Seminal Vesicle →

1. Seminal vesicle is a tube like structure which



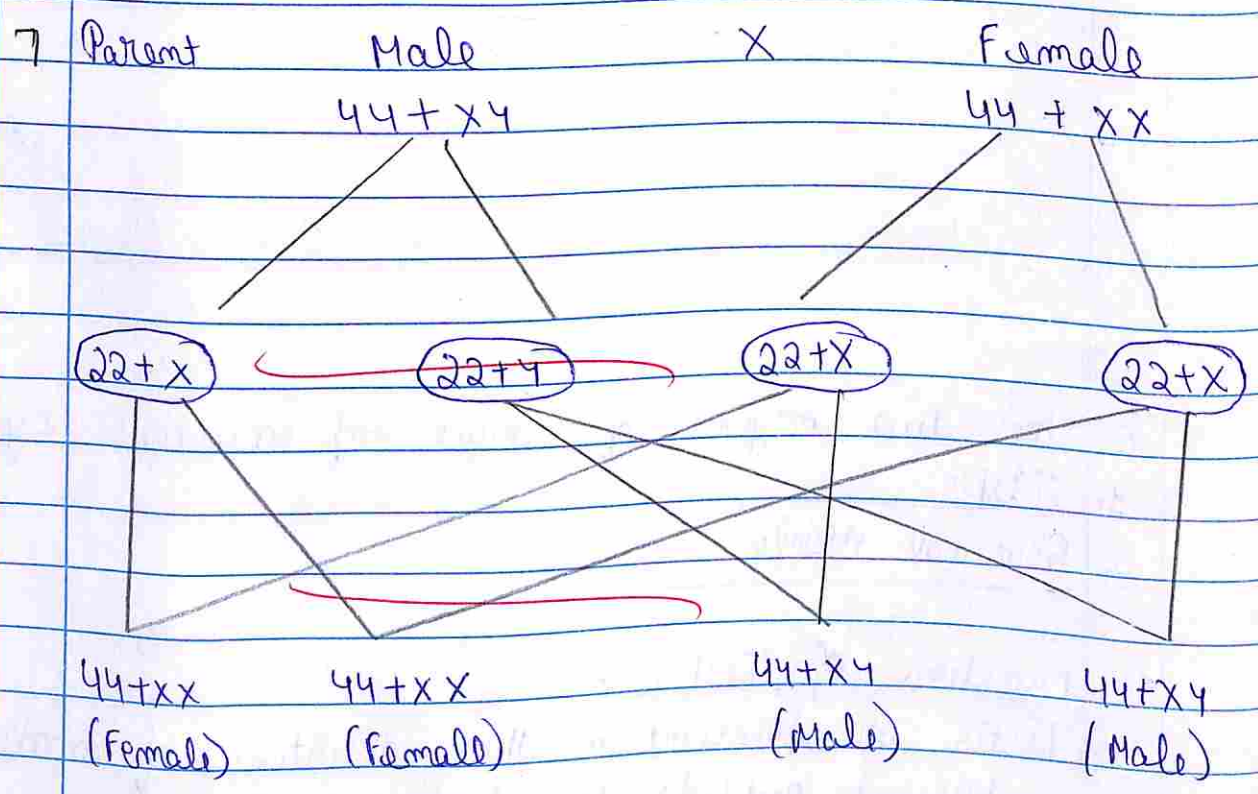
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serves as a common path for both urine and sperms to throw out of the body.

2. It also provides a liquid medium to sperms called semen. #



2

In humans, females are homogametic and males are heterogametic. There is a chance of 50% of male child and 50% of female child ( $44 + XX$ )

## SEX DETERMINATION IN HUMANS



8. The refractive index of a medium tells us about the speed of light in that medium. The more the refractive index, the less speed of light.

The less the refractive index, the ~~more~~ more is the speed of light.

$$n \propto \frac{1}{v}$$

Refractive index is of 2 types →

1. Absolute refractive index → It remains same.

$$\frac{\text{Speed of light in vacuum}}{\text{Speed of light in medium}} = \frac{c}{v}$$

2. Relative refractive index → It changes according to the medium.

$$\frac{\text{Speed of light in medium 1}}{\text{Speed of light in medium 2}} = \frac{v_1}{v_2}$$

9. The colour of the sky is blue due to the scattering of light. As we know, when white light ~~passes through~~ the prism, it got dispersed into its 7 colours. Similarly, sunlight after entering earth's atmosphere got dispersed and due to which every colour got scattered except blue. Because blue colour has shorter wavelength that is why our ~~eye~~ eyes are



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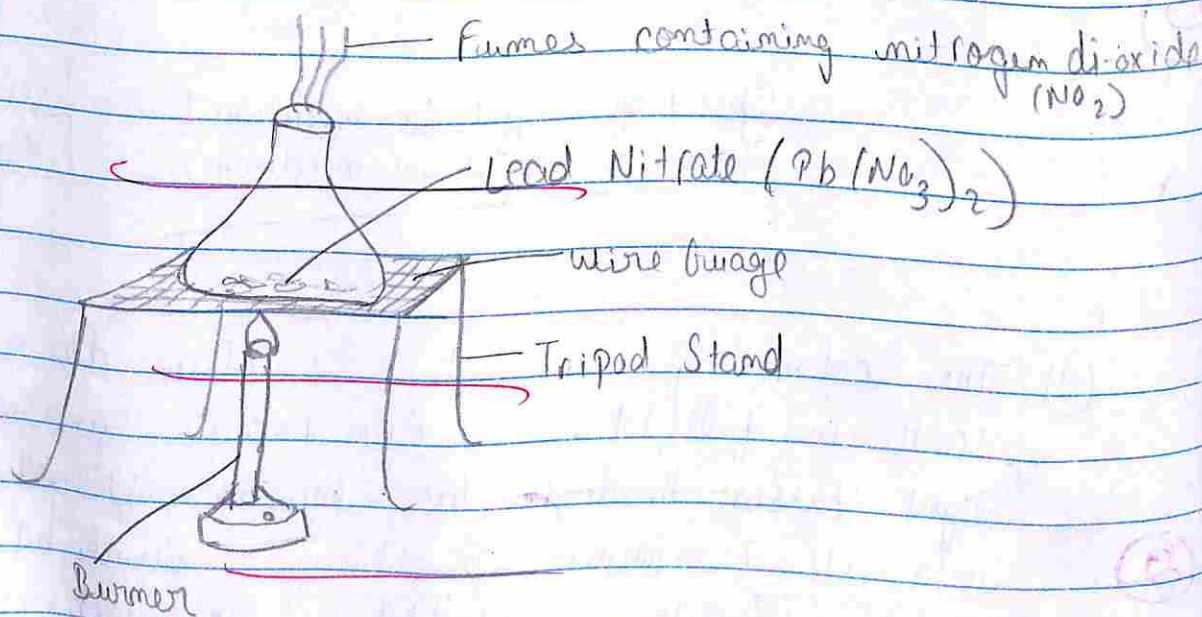
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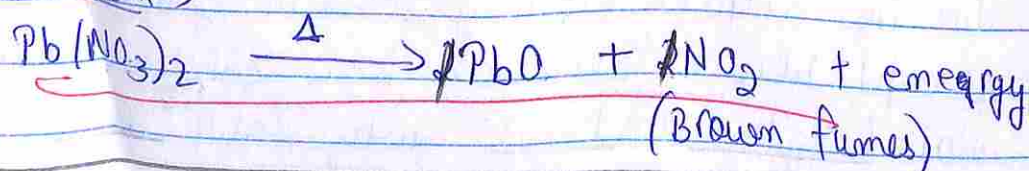
able to capture only the blue colour than the red. So, sky appears blue to us.

10. An electric fuse is a very important element and it is used in domestic circuits because ~~it acts as a safety device~~. The melting ~~of~~ point of fuse wire is very low. So, when current flowing through the wire ~~exceeds the limit~~, the fuse will break, Thus, breaking the circuit. The fuse wire prevent us from getting electric shocks and also prevent overloading or shortcircuiting.

11.



Reaction  $\rightarrow$

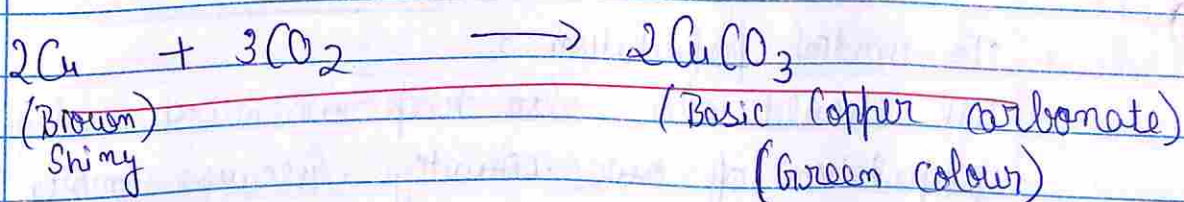




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|----------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------|
|                            | 12            | $2\text{NaOH(aq)} + \text{Zn(s)} \longrightarrow \text{Na}_2\text{ZnO}_2\text{(s)} + \text{H}_2 \uparrow$<br>(Hydrogen) |
| 2                          |               | The [x] in the above reaction is $\text{H}_2$ (Hydrogen gas), which is liberated when NaOH reacts with Zn (Zinc).       |

- 13 If copper is kept <sup>copper</sup> in moist carbon dioxide, it will corrode and form basic copper carbonate ( $\text{CuCO}_3$ ) on it. This layer is of green colour, and will thereby degrade the quality of copper.

The reaction involved is as follows  $\rightarrow$



### SECTION - C

- 14 The reasons for adopting contraceptive devices are  $\rightarrow$
1. To maintain proper spacing between pregnancies.
  2. To maintain the economy of the family.
  3. To ~~control~~ population.
  4. To avoid unwanted pregnancies.

(1) Proper spacing between pregnancies  $\rightarrow$



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The woman who has just ~~del~~ delivered the baby has to take some rest, to get her body recover for another baby. So, <sup>to</sup> maintain this contraceptive methods are very important.

2. To maintain economy of family →

It should be kept in mind that the more the number of children, more will be their expenses.

For example → If there are 6-7 children in a family, it will definitely affect the economy of the family. So, contraceptive are essential.

(3)

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3. To control population →

We should ~~also~~ keep in mind about the population of our country. Because more the number of people, the less facilities they will get.

4. To avoid unwanted pregnancies →

~~Contra~~ Contraceptive methods are necessary to avoid unwanted pregnancies.

For example → If ~~we~~ someone don't want a baby and have sexual intercourse with someone. Contraceptive methods can help.

Some examples of contraceptive methods are condoms, oral pills, surgical methods like vasectomy (males)



and tubectomy (females)

- 15 The major cause of depletion of ozone layer is CFCs (Chlorofluorocarbons) which is released by refrigerators, A.C, etc. Other substances like methane and oxides of various substances present in the atmosphere are causing a great threat to ozone ( $O_3$ ) layer.

The steps taken to prevent this are →

1. The United Nations Environment Programme (UNEP) has banned the use of CFCs.
2. Minimising the use of such appliances which release CFCs.
3. Minimise the use of vehicles because they cause pollution and release harmful gases which are depleting Ozone layer.

- 16 Ohm's law →

Ohm's law states that the potential difference across ~~the ends of the~~ given metallic wire is directly proportional to the current flowing through it, ~~provided with the~~ (physical conditions) i.e., the temperature remains constant.

~~$V \propto I$~~

$V = IR$

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Here,  $V$  = Potential difference $I$  = Current $R$  = ConstantResistance →

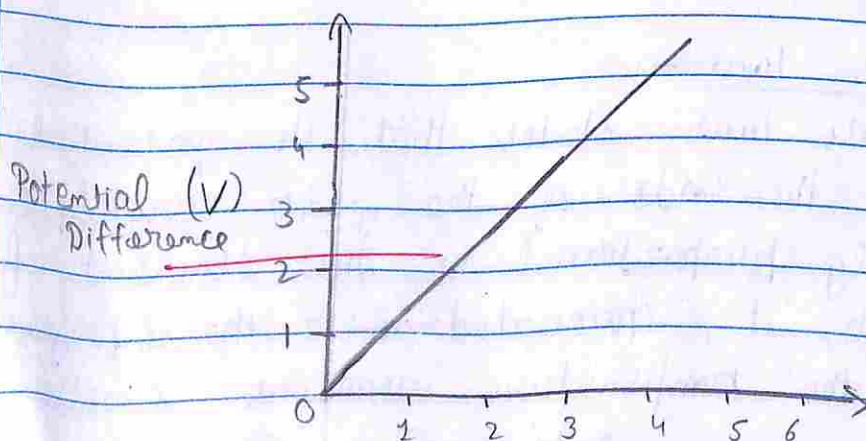
It is the property of a conductor to resist flow of charges. It depends on length of the conductor, area, nature and temperature of the conductor.

Its S.I. unit is ohm ( $\Omega$ ).

$$R = \rho \frac{l}{A}$$

here,  $\rho$  = rho (resistivity) $l$  = Length of conductor $A$  = Area of cross-section

Graph between Potential difference and nichrome wire →



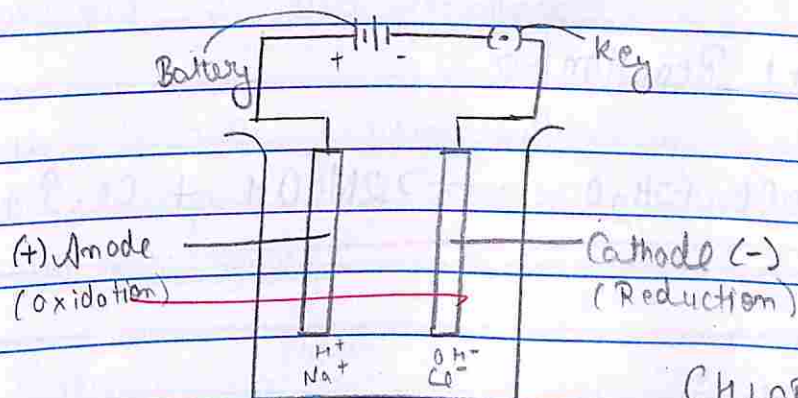
(I) Nichrome wire

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The graph between Potential difference ( $V$ ) and microampere wire ( $I$ ) shows a straight line which means as Potential difference increases, current ( $I$ ) will also increase.

17

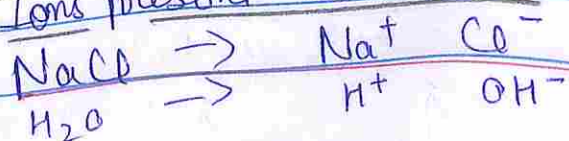


CHLOR-ALKALI  
PROCESS

In the chlor-alkali process, electricity is passed from the aqueous solution of NaCl, i.e., brine. After which, the ions present in the solution like  $Cl^-$  will rush towards the anode and get liberated in the form of  $Cl_2$  gas and the  $H^+$  ions will rush towards cathode and get liberated as  $H_2$  gas. Now,  $Na^+$  &  $OH^-$  is left in the solution, it combines which leads to the formation of  $NaOH$  (sodium hydroxide).

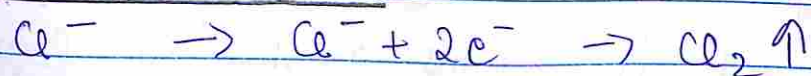
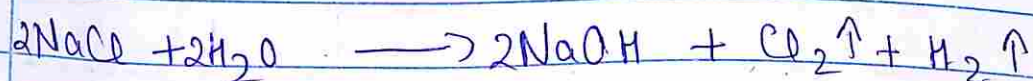
This process is known as chlor-alkali because  $Cl_2$  gas is liberated (chlor) and alkali for the production of  $NaOH$ .

Ions present in solution  $\rightarrow$

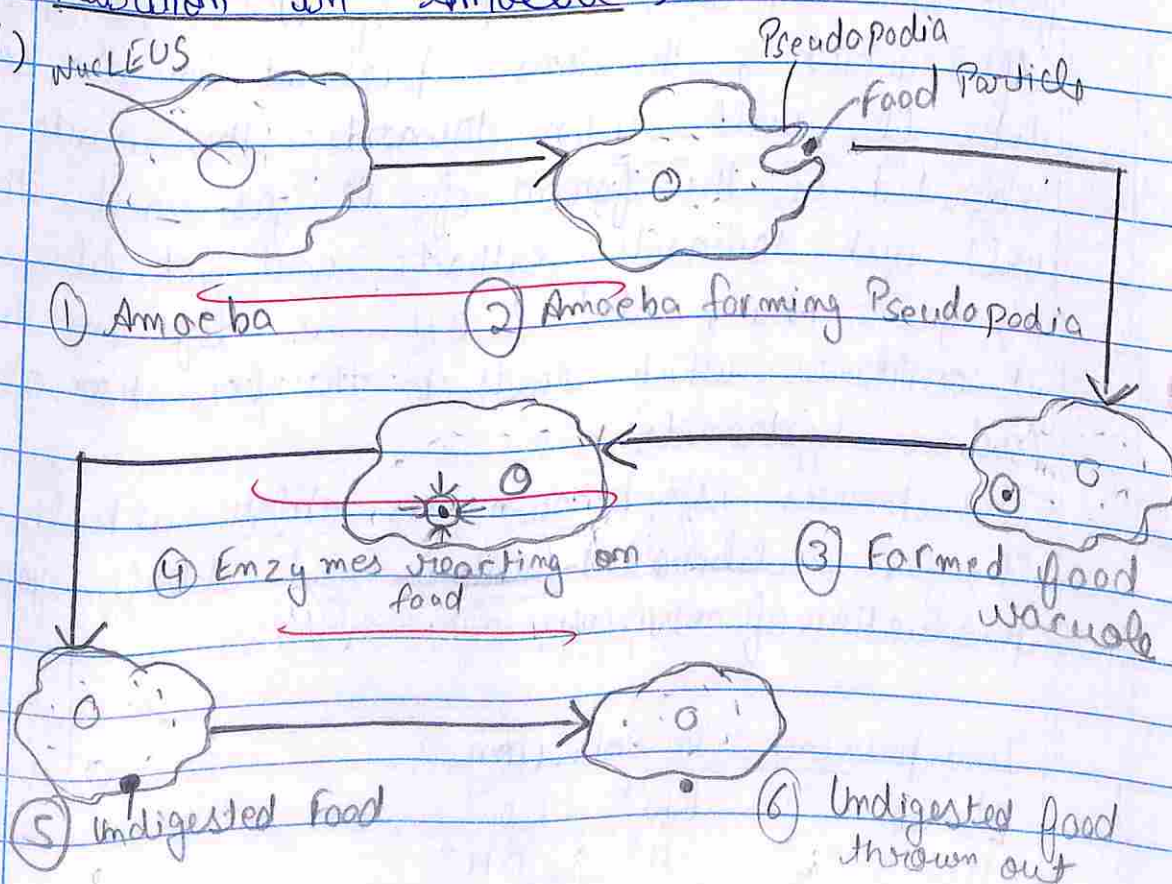


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Reaction at anode  $\rightarrow$ Reaction at cathode  $\rightarrow$ Net Reaction  $\rightarrow$ SECTION - D18 Nutrition in Amoeba  $\rightarrow$ 

(i)



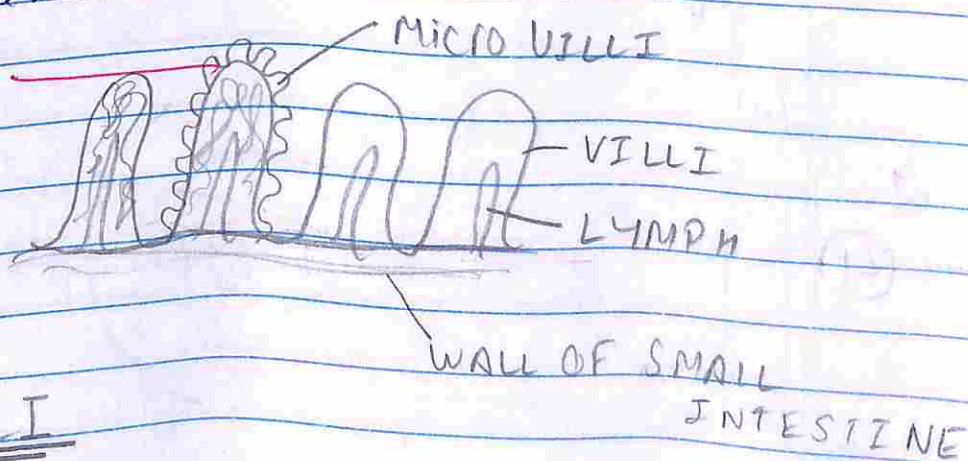


In nutrition in amoeba, it first engulfs the food by forming Pseudopodia then it forms food vacuole. The enzymes in the vacuole digest the food then the food is released in the cytoplasm for absorption. At last, undigested waste is thrown out. It uses Holozoic mode of nutrition.

- (ii) Pancreas secretes Pepsin which is a protein digestive enzyme. It converts proteins into amino acids.

Proteins  $\xrightarrow{\text{Pepsin}}$  Amino acids.

- (iii) There are thousands of villi present in the wall of our small intestine. The villi increase the absorptive surface area. It is profused with a network of blood vessel and also contain a lymph vessel which helps in absorbing fatty acids and glycerol. Villi also contain microvilli on its surface.



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19 Given,  $f = -24$  cm (Concave mirror)(i)  $u = -16$  cm $v = ?$ Mirror formula,  $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ 

$$\frac{1}{-24} = \frac{1}{v} + \left(\frac{1}{-16}\right)$$

$$\frac{1}{-24} = \frac{1}{v} - \frac{1}{16}$$

$$\frac{1}{-24} + \frac{1}{16} = \frac{1}{v}$$

$$\frac{-2 + 4}{48} = \frac{1}{v}$$

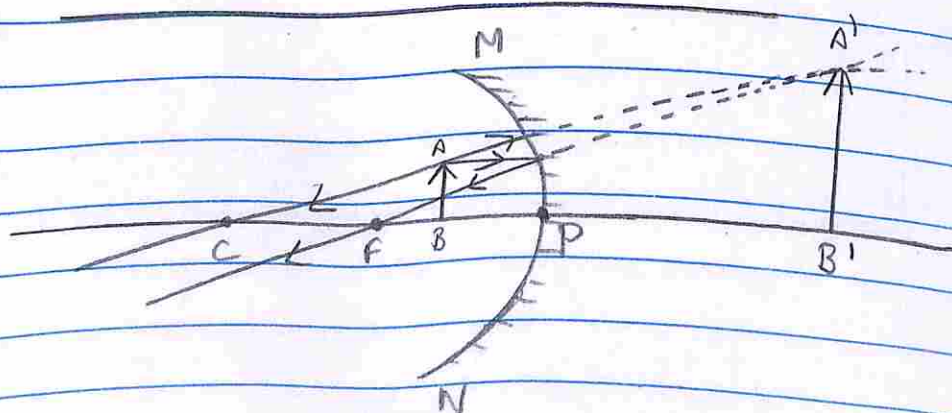
$$\frac{2}{48} = \frac{1}{v}$$

12 cm

$$24 \text{ cm} = v$$

So, ~~mirror~~ screen should be placed at 24 cm away from mirror to obtain sharp image.

(ii)



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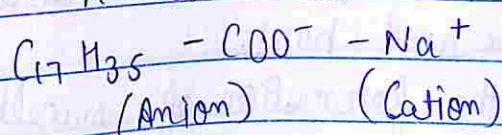
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Position of object = B/w P &amp; F

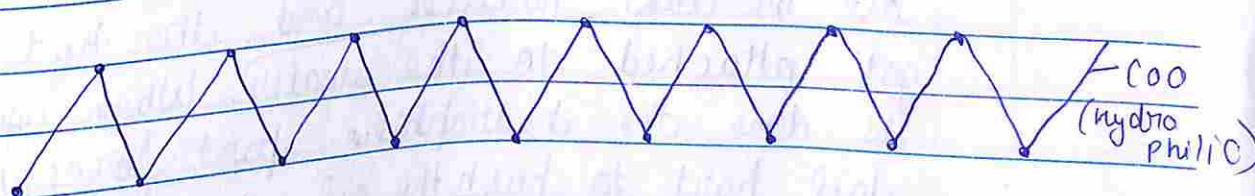
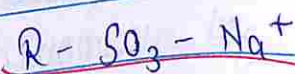
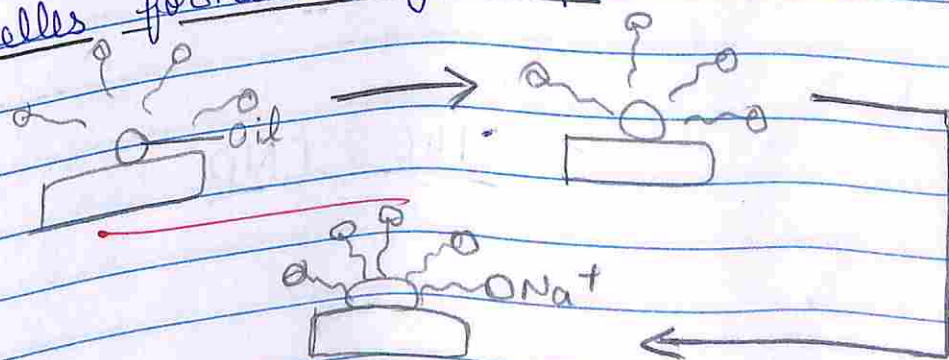
Position of image = Behind the mirror

Size of image = Enlarged

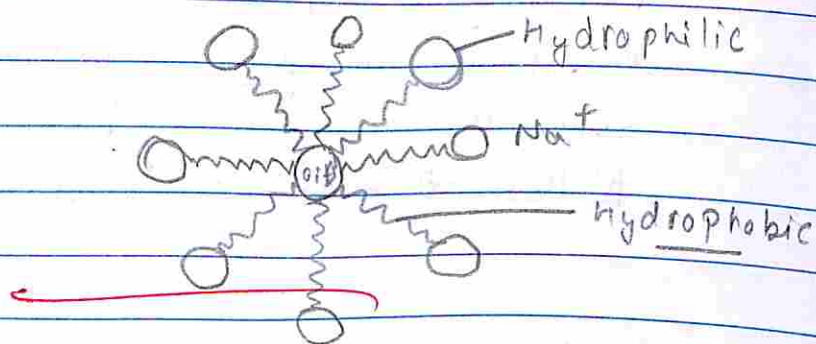
Nature of image = Virtual and Erect

20 Structure of soap → Sodium or Potassium Salt

(Tail Part) (Head Part)

Structure of Detergent → Ammonium or Sulphonate Salts.Micelles formation by soap →

P.T.O.



The micelle contains 2 parts, 1 is hydrophobic i.e., the tail part & the other is hydrophilic i.e., the head part.

4

HSR-1802/25

During the formation of micelle, this the hydrophobic part got attached to the oil or dust particle and the hydrophilic got attached to the water. When agitation is done the hydrophilic part force the tail part to push the oil or dust out from the cloth. After that, when a cloth is rinsed ~~the~~ thoroughly with water, the oil or dust got removed and ~~we~~ <sup>we</sup> got a clean cloth. This is how micelle formation takes place.

THE END



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(80)

अस्सी

४८



