

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली  
Central Board of Secondary Education, Delhi

(परीक्षार्थी भरें To be filled in by the candidate)

परीक्षार्थी प्रश्न-पत्र के ऊपर लिखे कोड को दर्शाये गये बॉक्स में लिखें  
Candidate should write code no. as written on the  
top of the question paper in this box

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

→

परीक्षा का नाम Name of the examination AISSE 2012

कक्षा Class 10th

विषय Subject SCIENCE

परीक्षा का दिन एवं तिथि  
Day & Date of the Examination TUESDAY, 20/3/12

उत्तर देने का माध्यम Medium of answering the paper ENGLISH

किसी शारीरिक अक्षमता से प्रभावित हो या सम्बन्धित  
क्या मैं ✓ का चिह्न लगायें

B  D  H  S  C

B = बहिर्दीन D = अन्क व अंधापण H = शारीरिक रूप से विकलांग, S = स्फस्टिक, C = डिस्लेक्सिक

If Physically challenged tick the category

B = Blind, D = Deaf & Dumb, H = Physically Handicapped, S = Spastic, C = Dyslexic

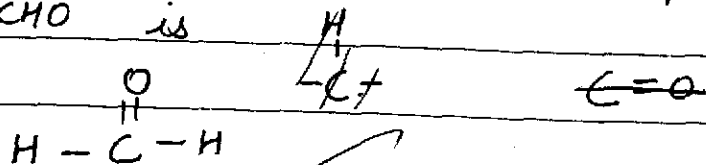
आप तसखन-निमित्त उपलब्ध करवाया गया है / नहीं

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## Section A

Ans 1. First member of the carbon compounds having functional group -CHO is



methanal

Ans 2. Ciliary muscles in the human eye help to adjust the focal length of eye lens so that the object can be focussed properly and image can be formed on retina.

Ans 3. Molecule made up of 3 atoms of oxygen is  $\text{O}_3$  i.e. ozone

Ans 4. Gardens and crop fields are the two man-made ecosystems.

Ans 5. Elements have similar properties if they have same number of valence electrons.

a) A same group has similar properties because all the elements

in a group have same number of electrons in their outermost shells i.e. valence electrons.

b. Same period have different properties because all the elements in a group do not have same number of valence electrons instead they have same number of shells.

Ans 6. a) Element E belongs to group 16 ✓

b) Element E belongs to the 3rd period.

c) Element E has 6 valence electrons.

d) Element E has valency 2 as it needs 2 electrons to fill its outermost shell.

Ans 7. Vegetative propagation is practised for growing some types of plants because :-

- Plants grown by this method bear flowers and fruits earlier than the plants grown from seeds.

- Plants grown by this method are genetically similar to

- the parent plant and have same characteristics.
- This method makes <sup>possible</sup> the propagation of plants which have lost the ability to produce seeds.
  - Survival rate of plants grown by this method is more than that of seed grown plants.

B. Rose and sugarcane are grown by vegetative propagation.

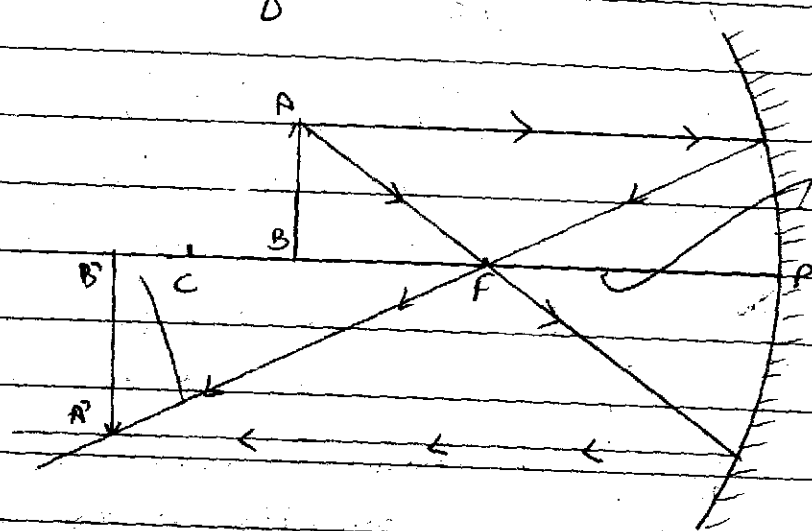
Ans 3. Placenta helps in the development of the embryo. It is <sup>of the female</sup> disc embedded in the uterus, which has villi in the side of the embryo and has blood spaces in the side of the mother. This increases the surface area for the transfer of glucose and oxygen from the mother's side to the embryo's side. The growing embryo also secretes some waste substances, these waste substances are also passed to mother's blood with the help of placenta. Therefore, placenta provides protection and nourishment to the growing embryo.

Ans 4.

Q. 9.

a) When a ray of light passes through the principal focus of a concave mirror, then after reflection it will emerge parallel to the principal axis.

b. When a ray of light is parallel to the principal axis of a concave mirror, then after reflection it will pass through the principal focus.

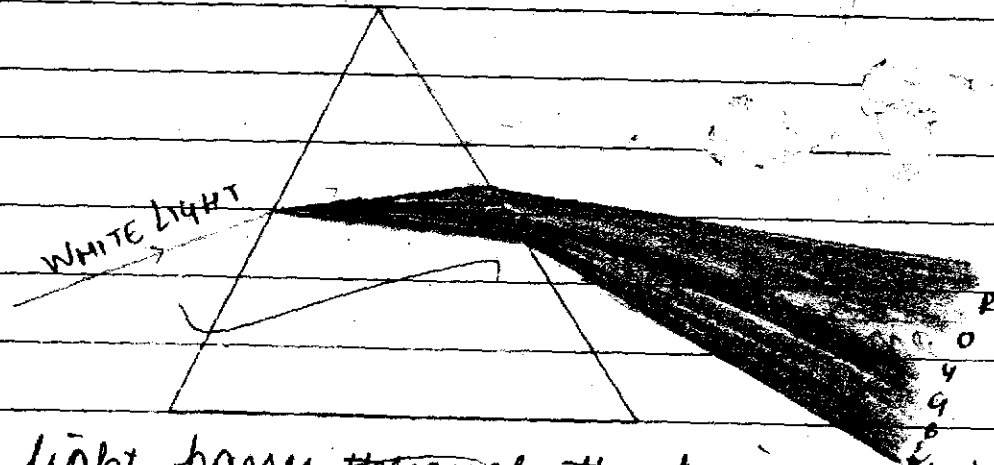


Let AB be the object

The image will be formed real, inverted and larger in size.

Ans 10 The colour of sky during day time is blue because the particles present in the atmosphere like dust particles, water droplets etc., have the size smaller than the wavelength of the visible light. Therefore, they will scatter the light of shorter wavelength at the blue end more strongly than the light of longer wavelength at the red end. Hence, when sunlight enters the earth's atmosphere blue colour is scattered more strongly than any other colour. and this blue colour reaches our eyes and the sky seems blue.

Ans 11



When white light passes through the prism, it splits into a band of 7 colours called spectrum.

Ans 12 a) When fossils fuels are burnt, then ~~the~~ carbon dioxide, water, oxide of nitrogen, oxide of sulphur are formed. But when fossil fuels undergo incomplete combustion, then instead of carbon dioxide, carbon monoxide is formed.

b. Oxides of nitrogen and sulphur and carbon monoxide are very poisonous even at low concentration and carbon dioxide causes green-house effect.

c. ~~When~~ If all the fossil fuels are burnt together then so much carbon <sup>dioxide</sup> will ~~be~~ release that it will affect photosynthesis and will increase global warming.

Ans 13 Problems caused by construction of large dams are:-  
1. Social problems:- Because of construction of large dams, tribals and peasants are displaced without any compensation and rehabilitation, rehabilitation.

2. Economical problems:- The construction of large dams



swallow huge amount of public money without <sup>giving</sup> any proportionate benefits.

3. Environmental problems:- Such construction contribute enormously to deforestation and loss of biological diversity

Solutions :-

1. People displaced should be given proper compensation and a new place to live.
2. In these dams the benefits of building such dams should be equally distributed among all, whether rich or poor.
3. The government should try to build these dams in ~~the~~ without causing much loss of biodiversity.

Ans 13) Inherited traits are the traits which can be passed from one generation to another and can direct evolution. These traits cause a change in DNA.

Acquired traits are the traits which cannot be passed

from one generation to another and can't direct evolution. They do not cause any change in DNA.

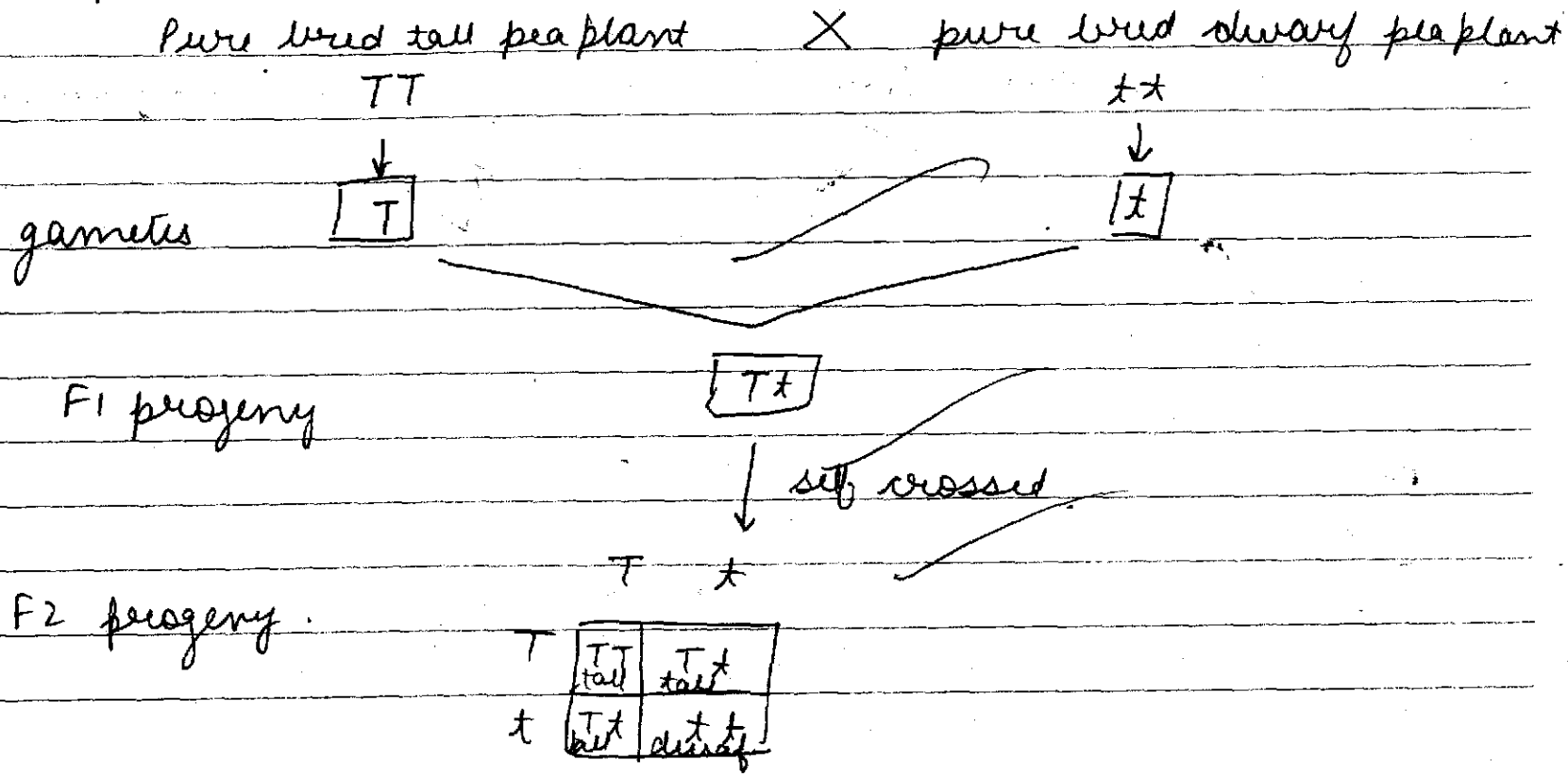
- b. acquired traits are not passed to next generation as they are at physical level only and do <sup>not</sup> cause any change in DNA.
- c. ~~the~~ The experiences of a person are not passed to next generation as a person has just acquired them and there is ~~not~~ change in DNA because of them.

Ans 15. Fossils are the impressions ~~of~~ on rocks <sup>of</sup> the dead organisms that got buried inside the earth <sup>millions of years ago</sup>. For eg., if a dead insect is caught in a hot mud, then the body will not decompose quickly, instead the mud will first retain its impression, then it will decompose.

- b) Two methods of determining the age of fossils are :-

1. We can <sup>detect</sup> ~~detect~~ the age of fossils by digging the earth. The fossils that are ~~more~~ closer to the earth's surface are more recent than the fossils found in the deep layers.
2. We can detect the age of fossils by detecting the ratio of different isotopes of the same element in the fossil material.

Ans 16. Let pure bred tall pea plant be expressed



- a) All the plants in  $F_1$  generation were tall, therefore they express the dominant trait.
- b. The ratio of tall plants to dwarf plants in  $F_2$  generation is 3:1.
- c. The dwarf plants were not found in  $F_1$  <sup>generation but</sup> appeared in  $F_2$  generation because when  $F_1$  generation was formed only dominant trait (tallness) was expressed but when the  $F_1$  progeny was <sup>self</sup> crossed to form  $F_2$  generation then, both Dominant as well as recessive traits were expressed because in both the traits were ~~acquired~~ inherited from the parents.

Ans 17) Let height of the object,  $h = 5 \text{ cm}$

Focal length,  $f = 12 \text{ cm}$ .

Object distance,  $u = -8 \text{ cm}$ .

Using lens formula

let image distance =  $v$

$$\frac{1}{8} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{12} = \frac{1}{v} - \frac{1}{(-2)}$$

$$\frac{1}{12} = \frac{1}{v} + \frac{1}{8}$$

$$\frac{1}{v} = \frac{1}{12} - \frac{1}{8}$$

$$\frac{1}{v} = \frac{2-3}{24}$$

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

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

magnification  $\Rightarrow \frac{h'}{h} = \frac{v}{u}$

$$\frac{h'}{5} = \frac{-24}{-8}$$

$$\frac{h'}{5} = 3$$

$$h' = 15 \text{ cm}$$

$\therefore$  The size of the object is 15 cm.

the image is at 24 cm on the same side of the lens as the object is.

let  $h'$  be the height of the image

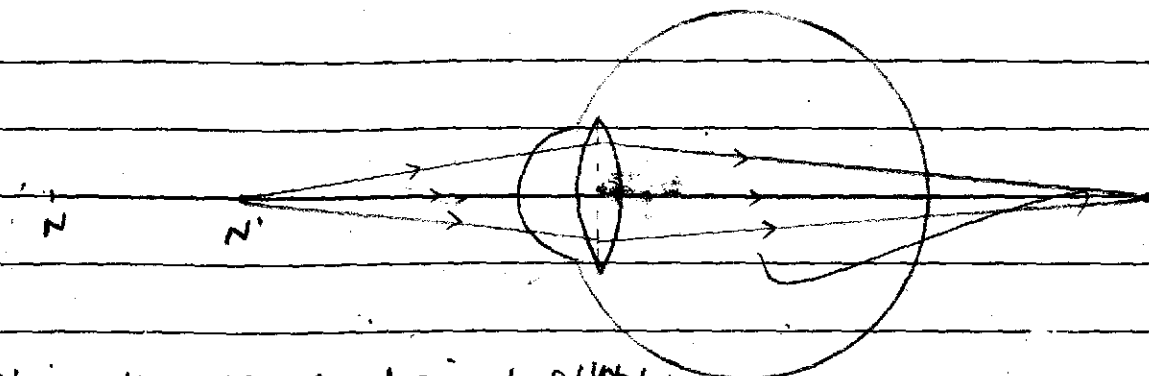
Nature:- The image formed is virtual, erect and is larger in size than the object. It is formed on the same side of the lens as the object is.

Ques 18. (i) Concave mirror is used in vehicle headlights because it gives powerful parallel beam of light which facilitates in safe driving.

(ii) Convex mirror is used as a rear view mirror because it gives virtual, erect though diminished image. It also provides a wide field of view to the driver and thus, he is able to prevent accidents by looking at the traffic <sup>behind him</sup> in rear view mirror.

Ques 19. If the old man is not able to see objects closer than 1 m than, he is suffering from hypermetropia. In this defect, the image is formed behind the retina. Therefore convex lens will help him to correct the defect, as it will help the image to be formed on retina.

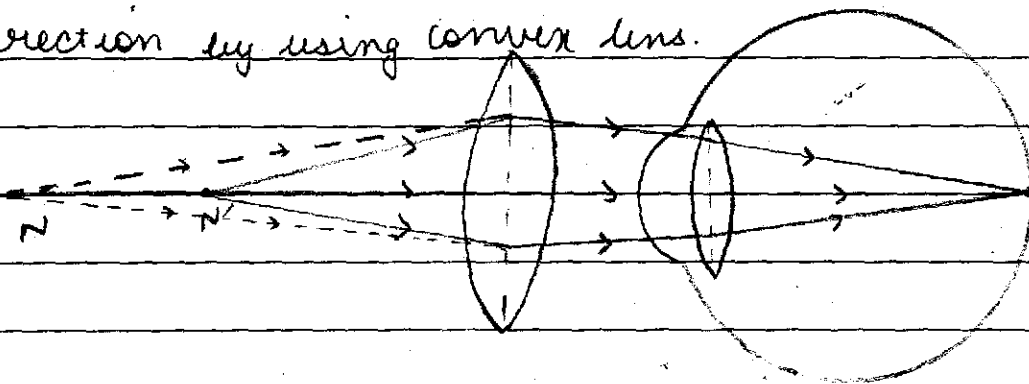
i DEFECT  $\rightarrow$  HYPERMETROPIA



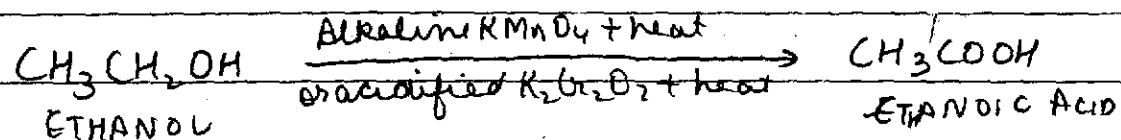
N is the near point of old man.

N' is the near point of the normal eye.

ii Correction by using convex lens.



Ans 20. Alkaline potassium permanganate or acidified potassium dichromate is used <sup>as the oxidising agent</sup> for the conversion of ethanol to ethanoic acid.



Ans 1 i) LITMUS TEST → Ethanol is neutral towards litmus  
Ethanoic acid turns blue litmus red.

ii) Reaction with sodium hydrogen carbonate →  
Ethanol does not react with sodium hydrogen carbonate.  
Ethanoic acid reacts with sodium hydrogen carbonate  
to form  $(\text{CH}_3\text{COONa})$  salt, water and  $\text{CO}_2$ .

Ans 2 i) Contraceptive devices are used to prevent fertilisation.

3 methods of contraception are:-

① BARRIER METHOD

② CHEMICAL METHOD

③ SURGICAL METHOD

1. Barrier Method

In this method a physical device is used to prevent the entry of sperm in female genital tract.

2. Chemical method



This method involves taking medicines in the form of oral pills. These medicines contain certain hormones which inhibit prevent fertilization or implantation of embryo.

### 3. Surgical method.

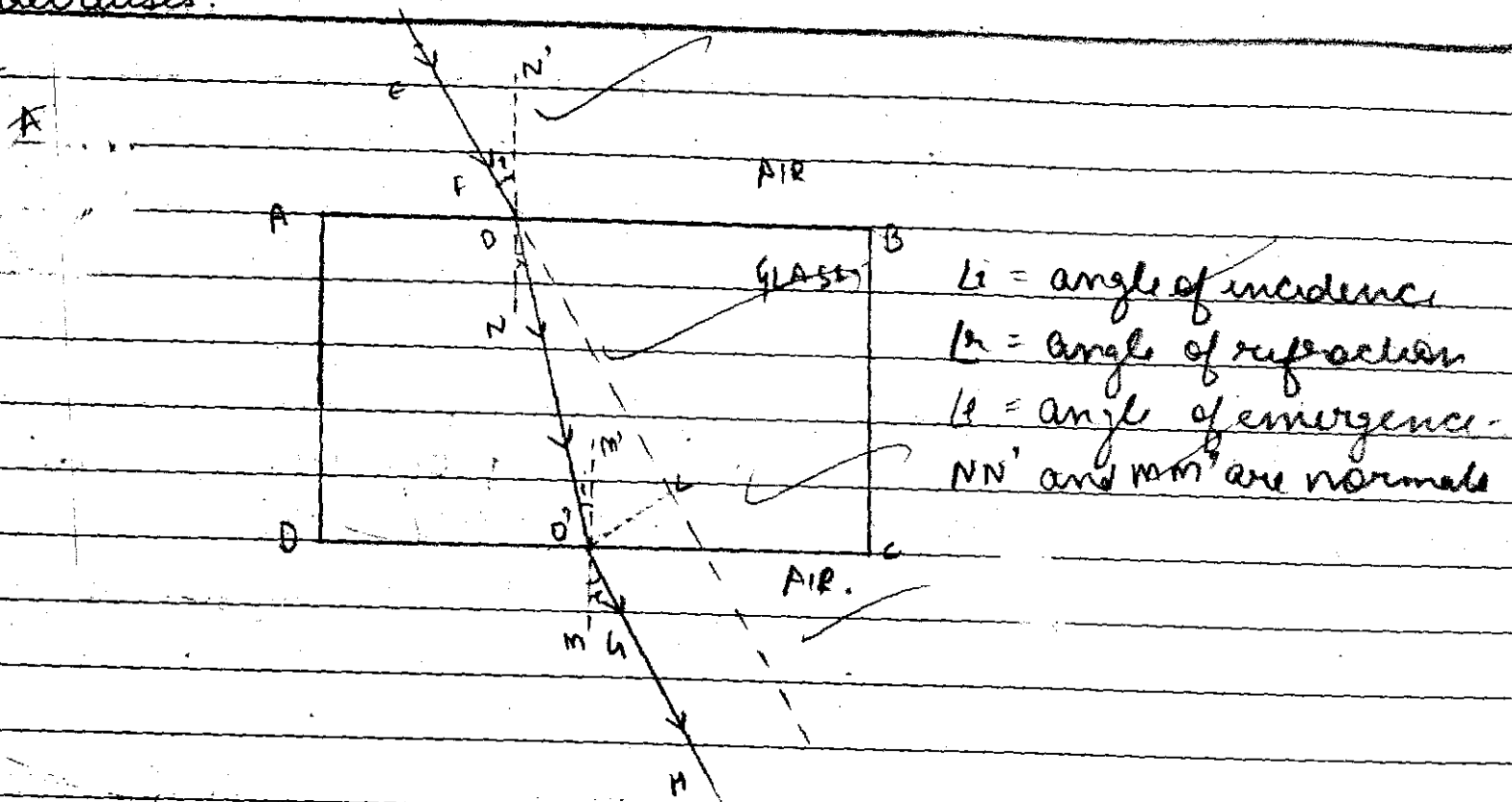
This method is of 2 types  $\rightarrow$  Vasectomy and Tubectomy. In vasectomy, a cut is made in the vas ~~deferens~~ deferens of males and the cut ends are joined/sealed separately to prevent the flow of sperm. In tubectomy, fallopian tubes in females ~~is~~ given a cut and cut ends are joined separately to prevent fertilization.

Ques 2. ~~Na~~ Na or sodium has the largest atomic radius because as we go <sup>from</sup> left to right in a period, the nuclear charge <sup>acting on the electrons</sup> increases and the electrons are pulled towards the nucleus. Therefore, their atomic size decreases. Na, Mg, Al are all in a period, hence sodium will have the largest atomic radius.

ii. Al, aluminium <sup>is a metal and</sup> is least reactive, because across/a period, as the <sup>among the</sup> ~~most~~ <sup>quinn</sup> ~~reactive~~ <sup>metals</sup>

nuclear charge increases, the ~~tendency~~ reactivity decreases, ~~decreases~~ <sup>and</sup> as the tendency to lose electrons <sup>also</sup> decreases. Aluminium is having 3 electrons in its valence shell and need to lose them to gain a noble gas configuration. ~~But~~ But due to increased nuclear charge, it is difficult for to lose them, therefore its metallic character or the reactivity decreases.

Ans 23



When light travels from one medium to another, the direction of propagation of light in the second medium changes. This phenomenon is called refraction of light and is due to different speeds of light in different ~~mediums~~ media.

In the figure, a ray of light is incident on a glass slab.  $EO$  is the incident ray,  $OO'$  is the refracted ray and  $O'H$  is the emergent ray. When light travels from <sup>(rarer medium)</sup> air to <sup>(denser medium)</sup> glass, its speed decreases and it bends towards the normal. When the light passes from glass to air, it speeds up and moves away from the normal.  $OL$  is the displacement caused by the incident ray. Incident ray is parallel to the emergent ray.

~~Across~~ The ratio of sine of angle of incidence to sine of angle of refraction for a light of given colour and for a given pair of media is constant. This is known as Snell's law for refraction of light.

Mathematically,

$$\frac{\sin i}{\sin r} = \text{constant}$$

This constant is refractive index of medium 2 with respect to medium 1.

B. ~~Let refractive index of air with respect to glass is  $n_g = \frac{2}{3}$~~

~~Let refractive index of water with respect to water is  $n_w = \frac{4}{3}$~~

~~refractive index =  $\frac{\text{speed of light in air}}{\text{speed of light in the medium}}$~~

~~$$\therefore n = \frac{c}{v}$$~~

~~$$n_g = \frac{2}{3}$$~~

~~$n_g = \frac{\text{speed of light in air}}{\text{speed of light in glass}}$~~

~~$$\frac{2}{3} = \frac{c}{2 \times 10^8}$$~~

~~$$2 [2 \times 10^8] = 3c$$~~

~~$$c = \frac{2 \times (2 \times 10^8)}{3}$$~~

~~$$= \frac{2 \times 2 \times 10^8}{3} = \frac{4 \times 10^8}{3}$$~~

speed of light in glass =  $2 \times 10^8$  m/s

B. i Refractive index of air with respect to glass  $\Rightarrow n_{ag} = \frac{2}{3}$

$$n_{ag} = \frac{v_g}{v_a} \quad \begin{array}{l} \text{speed of light in glass} \\ \text{speed of light in air} \end{array}$$

$$\frac{2}{3} = \frac{2 \times 10^8}{v_1}$$

$$\rightarrow (\text{speed of light in glass} = 2 \times 10^8 \text{ m/s})$$

$$v_1 = 3 \times 2 \times 10^8$$

$$\rightarrow (\text{let speed of light in air} = v_1)$$

$$= 3 \times 10^8 \text{ m/s}$$

$$\therefore \text{speed of light in air} = 3 \times 10^8 \text{ m/s}$$

ii Refractive index of water with respect to air  $n_{w} = \frac{4}{3}$

$$\text{Refr } n_w = \frac{\text{speed of light in air}}{\text{speed of light in water}}$$

$$\frac{4}{3} = \frac{3 \times 10^8}{v_2}$$

$$\rightarrow (\text{from eq (i)})$$

$$v_2 = \frac{3 \times 3 \times 10^8}{4} = \frac{9 \times 10^8}{4}$$

$$\rightarrow (\text{let speed of light in water} = v_2)$$

$$= 2.25 \times 10^8 \text{ m/s}$$

$$\therefore \text{speed of light in water} = 2.25 \times 10^8 \text{ m/s}$$

~~Ans 24~~ ~~The compounds formed by just carbon and hydrogen are called~~

<sup>OR</sup>  
Ans 24 a. Chemically, detergents are ammonium and sulphinate salts of long chain carboxylic acid.

b. MERITS of using detergents for cleansing :-

1. Detergents are effective in cleaning hard water as it they ~~do~~ not form scum on ~~that~~ reacting with calcium and magnesium ions of hard water. ~~It~~ They form foam readily in hard water.

2. Detergents are also effective for cleansing in acidic medium whereas, soaps are not effective in acidic medium.

c. Demerits of using detergents for cleansing are :-

1. They are non-biodegradable and hence cause pollution.

2 They also affect the colour and texture of the fabric which is washed with them.

A d. If the water is having calcium and magnesium ions in it i.e. it is hard water, then also detergents can be used ~~in it~~ for cleansing <sup>in it</sup> because the ammonium and sulphonate salts of detergents do not react with calcium and magnesium ions of hard water to form a curdy white precipitate (scum). Instead, detergents form foam readily in hard water.

Ans 25

#### UNISEXUAL FLOWERS

In these flowers, either carpel or stamen is present.

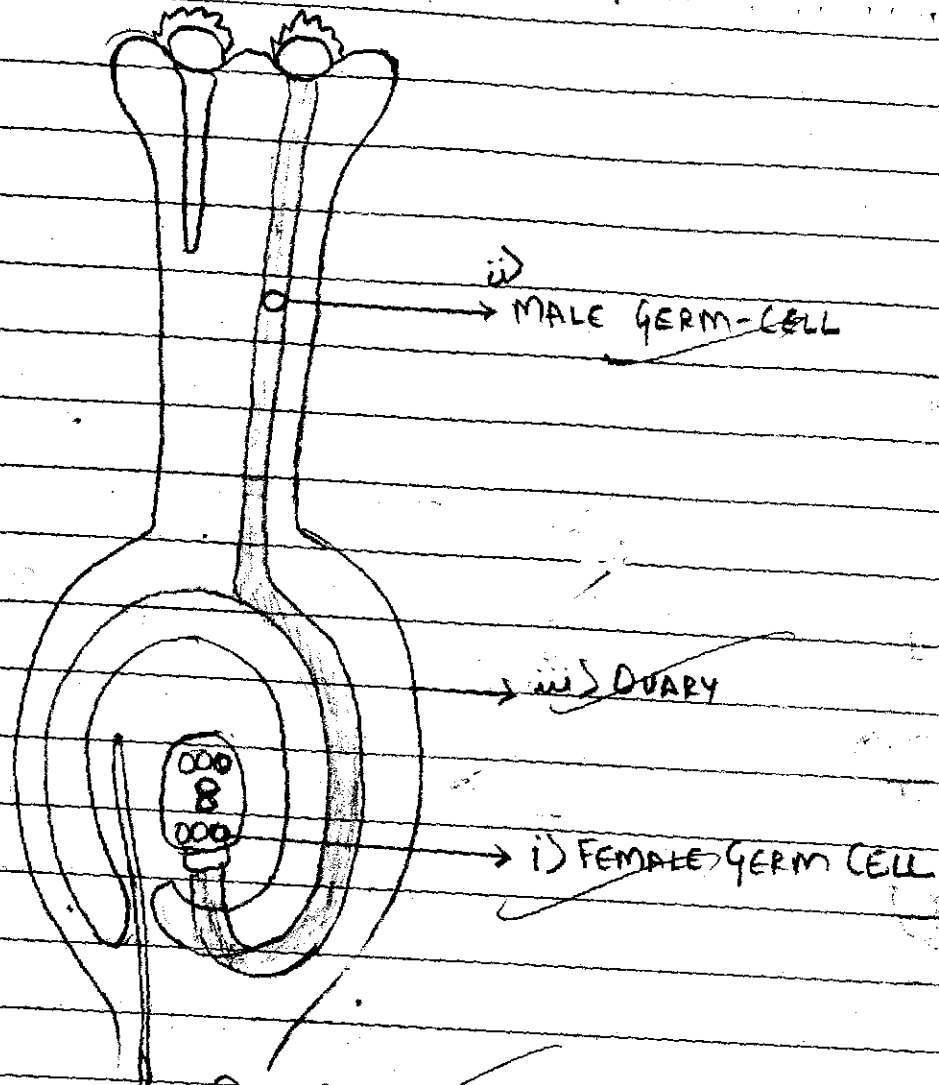
- They undergo cross pollination.
- Example, watermelon

#### BISEXUAL FLOWERS

- In these flowers, both carpel and stamen are present.

- They undergo self pollination.
- Example mustard.

B.



GERMINATION OF POLLEN GRAINS. 4



## Section B

Ans 26 A. ~~III~~, II, IV, I.

Ans 27 C. ~~V~~, II, III

Ans 28 D. ~~I~~, IV, V

Ans 29 A. ~~I~~

Ans 30 B.  $\frac{y-x}{x} \times 100$

Ans 31 D. filter paper.

Ans 32 A. a clear and transparent solution is formed.

Ans 33 C. bubbles of a colourless and odourless gas.

Ans 34 A. It turns blue litmus red and smells like vinegar.

- Ans 35. D. blue and colourless respectively.
- Ans 36. D. all the three.
- Ans 37. C. III
- Ans 38. C. III
- Ans 39. D. a convex lens, a screen, holders for them and a scale.
- Ans 40. D. a highly diminished inverted image of the tree at the focus of the mirror.
- Ans 41. B. a well-illuminated distant building.