



माध्यमिक शिक्षा बोर्ड, राजस्थान, अजमेर

माध्यमिक परीक्षा

परीक्षा का दस्तावेज भरा जाना चाहिये)

Candidate's Roll No. In English
(In Figures)

(In Words) _____

परीक्षार्थी का नामांक हिन्दी में
शब्दों में _____

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

माध्यम - हिन्दी ☒ अंग्रेजी ☐

विषय विज्ञान

परीक्षा का दिन सोमवार

दिनांक 25-03-19

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 है, 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 (परीक्षक के उपयोग हेतु)			
प्रश्नों की क्रम संख्या	प्राप्तांक	प्रश्नों की क्रम संख्या	प्राप्तांक
1		19	
2		20	
3		21	
4		22	
5		23	
6		24	
7		25	
8		26	
9		27	
10		28	
11		29	
12		30	
13		31	
14		योग	
15		प्राप्त अंकों का कुल योग (Round off)	
16		अंकों में	शब्दों में
17			
18			

परीक्षक के हस्ताक्षरसंकेतांक

प्रमाणित किया जाता है कि इस उत्तर पुस्तिका के निर्माण में 58 जी.एस.एम. क्रीमवोव कागज ही उपयोग में लिया गया है। 165/2019

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 पृथक् से 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, स्कूल, ज्योमेट्री बॉक्स पर कुछ न लिखकर लावें। टेबुल के आस-पास कोई अवैध 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 1 अंक कम करने का अधिकार है। बीच में उत्तर पुस्तिका के पृष्ठ रिक्त न छोड़ें। गणित विषय के लिए रफ कार्य 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 है। किसी भी प्रकार की त्रुटि/अन्तर/विरोधाभास होने पर हिन्दी भाषा के प्रश्न को ही सही माना जाये।

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- (1) Carnines are the teeth which are used in tearing and chopping of food as they are sharper at their ends.
- (2) Karl Landsteiner (1907), classified the blood into different groups.
- (3) The full form of CNG is Compressed Natural Gas.
- (4) Definition of potential energy:- The energy possessed by an object by the virtue of its position, shape and configuration is called potential energy.
ex- Stretching of a bow
- (5) One example of renewable resource is solar energy.
- (6) Scientific name of Coffee plant is Coffea Arabica.
- (7) Genetic Diversity:- The diversity present among the various organisms within a species due to their genetic makeup or constitution is called Genetic Diversity. The more the genetic diversity, the less the rate of extinction.



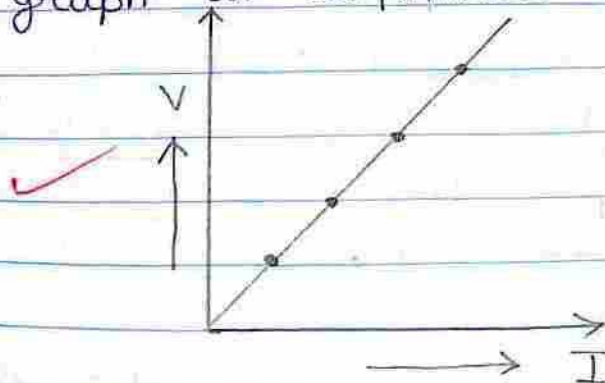
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प्रश्न
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- (8) Iron (Fe) is the element that take part in the formation of haemoglobin in blood.
- (9) Antibody IgE participates in allergic reactions.
- (10) Rh antigen is found on the surface of the red blood corpuscles in addition to 'A' and 'B'.
- (11) According to ohm's law,
 $V \propto I$

The graph is as follows:-



Straight line graph is drawn.

Section-B

12.] The name of natural satellite of Earth is Moon.

→ Process of origin of Moon:-

It is believed that after the formation of Earth a large celestial body whose size was approximately equal to plane



Mars collides or strikes with the Earth. Due to this collision the various debris ~~are~~ were formed. Moon is supposed to formed from these debris approximately 4.40 billion years ago.

→ Two importance of Moon for Earth are as follows:-

- (i) It keeps the earth to remain inclined at $23^{\circ}5'$ by exerting gravitational force. Also moon reduces the rotatory and revolutionary speed of the Earth.
- (ii) It also produces waves in oceans and seas specially on full moon night, when ~~the~~ moon's attraction force is highest.

13) Formation of fossils:- Fossils are the natural preserved or conserved traces or remain of the animals of ancient times.

→ Fossils are formed by various ways. Some of them are as follows:-

- (a) When the organisms buried down due to any natural disaster or due to death. The body was slowly and gradually decomposed by the microbes yet the shapes of their skeletons and other ~~body~~ body parts were left on the rocks. From here the fossils can be identified clearly.

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(b) Also some animals buried down the ice. Due to which their fossils are even preserved. It seems that they did not buried down at ancient times and are buried before some years. Ex- The traces of elephant like organisms are found and the traces of archaopteryx are also found.

→ Now a days the age of fossils can be determined easily, using C-14 isotope. The isotope of Carbon (C-14) has the amazing property to determine the age of fossils.

(14) The name of the first astronaut was "Yuri Gagarin" from Russia.

→ Following facilities are available to solve the problems of food and living in weightlessness on International Space Station.

(a) When the astronauts live in weightlessness condition then they are affected by various side effects. For this the arrangement of doing exercise is done on ISS. Various instruments for doing exercise are present. There are different rooms for living, experiment etc.

(b) The food is not taken directly at ISS.

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For this astronauts have to use small pipe to suck the liquid substances. The solid food is taken with the help of knife and forceps. To keep them on plate magnets are used.

(c) For the preservation of food various cold and hot storages are present at ISS but they can't keep the food fresh for long time.

(d) Special types of toilets are made. The urine is collected and used for various other purposes such as drinking, experiments etc. after filtration.

In this way, it can be seen that various facilities are available for astronaut at ISS.

(15) (a) Highways are the areas having huge or large amount of crowd so, the chances of accidents are more at highways. To prevent the accidents high beam of light should be used so that more vision and vehicles can be seen clearly.

(b) For safe driving concave mirrors are used in headlights and convex mirror are used as the rear view mirror of vehicles.

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(16) (a) The name of pathogen of maru (Bala) disease is Dracunculus Medinensis. Its female worm lay eggs in water.

(b) Two alkaloids found in opium are papaverine, morphine.

(c) The name of the disease caused by chewing Gutka is Submukus fibrosis.

(17) (a) $C + O_2 \rightarrow CO_2$. This is addition reaction
 $H_2O \xrightarrow{\text{electric current}} 2H_2 + O_2$. This is Electrolytic dissociation reaction.

(b) Difference between equation (i) & (ii)

→ In reaction first	→ In second reaction compound
two atoms or molecules are combined to form a single compound i.e. CO_2 .	is dissociated into H_2 and O_2 . when electricity is <u>passed</u> through it.

→ These two reactions are just opposite to each other.

(c) Catalytic inhibitor

→ Catalytic inhibitor decreases the work-

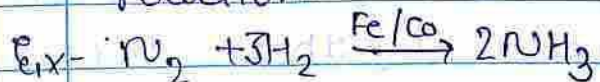
Catalytic promoter

→ Catalytic promoter increases or promotes the

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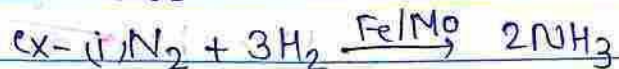
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ing rate of the catalyst
participating in any
reaction.

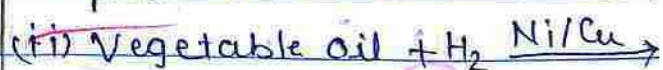


Here 'Co' is the catalytic
inhibitor.

rate of catalyst participat-
ing in any chemical
reaction.



Here 'Mo' is the catalytic
promoter



Vegetable Ghee

Here Cu is catalytic promoter

18] Forests protect the fertile soil by following ways:-

(1) The trees present in the forest binds the soil with their roots. Due to this soil erosion is prevented.

(2) Trees provide obstacle between the flow of fertile soil.

In this way forest protect the fertile soil from erosion

→ Four measures adopted for protection of the forests are as follows:-

(a) Forest fire cause a lot of damage to the plants. So, inspection houses should be established in the forests so, that if in case of forest fire immediate action can be taken.

(b) The trees should be cut in a sensible manner. The ratio of afforestation and deforestation



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Should be same. Priority should be given to high diversified forests.

(c) In case, if any disease is spread then the plants affected by that disease should be cut down.

(d) People should be aware and strict policies should be made. For social forestry should be promoted.

(19) The ancient grantha "Charak Samhita" is written in "Sanskrit" language.

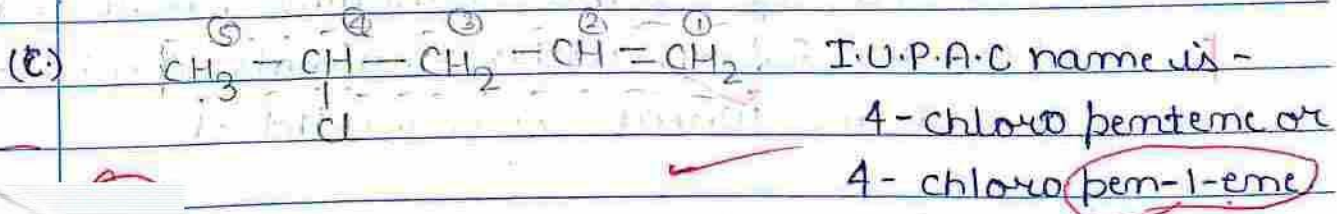
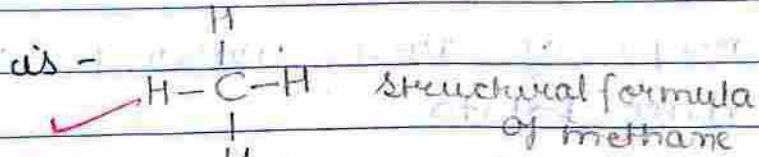
→ Knowledge of Charak in relation to genetics. In that contemporary era Charak has deep knowledge about genetics. He knew that how the gender (female or male) of a baby is confirmed. He also explains in his text that the reasons of lameness, blindness and other disqualities is ^{due to} the defect in the parents. All this information is obtained from 8 texts including poems and prose in Charak Samhita.

(20) One monomer of used in terylene is ethylene glycol $\begin{pmatrix} \text{CH}_2 - \text{CH} \\ | \\ \text{CH}_2 - \text{CH} \end{pmatrix}$

(b) Structural formula of Marsh gas CH_4

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(21) Biomedical wastes :- The wastes which are obtained from hospitals, clinics and other healthcare centres are commonly known as Biomedical wastes.
ex- cotton, Syringe, blood etc.

→ The name of the two diseases caused by them are- AIDS, Hepatitis-B.

→ As mostly biomedical waste are non-biodegradable so they are disposed with the help of incineration method. For this the medicinal waste is collected at one place on a large scale and is burned. Sometimes it is done at large scale while sometimes it is done at small scale. Due to their burning various pollutants are released in atmosphere.

Section-C

(22)(a) Protein is the nutritive element which is found in abundance in fish.



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- (b) Two examples of fresh water fishes- Catla, and Labao Rohita.
- (c) The diet of fishes contains small water plants, small water animals and grains such as- wheat, rice, millet etc.
- (d) Maximum production of fishes is done in pond as it contains fresh water also clayey soil which is essential is filled in the ponds. The fishes which comes out of egg called Zeera are put in production tanks. Later where when they become developed they are put in larger production tanks. Copper sulphate, Potassium permanganate, and methyl blue is used for their protection.

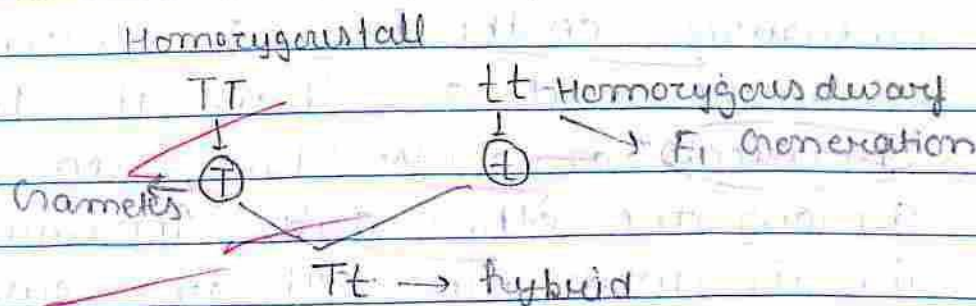
- (23) Mendel's law of dominance:- This is the Mendel's first law. It is based on monohybrid cross.
- According to this law, "Out of two alternate alleles of a gene only one can express itself in F_1 generation. The plants which express itself in F_1 generation are called "dominant" while the plants which can't able to express themselves in F_1 generation due to presence of dominant character

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are called "Recessive".

Example:- when Homozygous tall plants are crossed with Homozygous dwarf plants then all plants obtained are tall. It means 'T' is dominant and 't' is recessive.



⇒ Two importance of Mendel's law of inheritance are as follows:-

- Various harmful characteristics present in our body which remains recessive so they can't able to express themselves due to presence of dominant character.
- With the help of these law the useless trait among the plants can be removed during crossing over and useful traits such as disease resistance power etc can be increased.

(24)(a)(i) Milk of Magnesia [$Mg(OH)_2$] is used for treatment of acidity in stomach because $Mg(OH)_2$ is a weak base. It reacts with acids and forms salt and water. In this way it neutralizes the effect of



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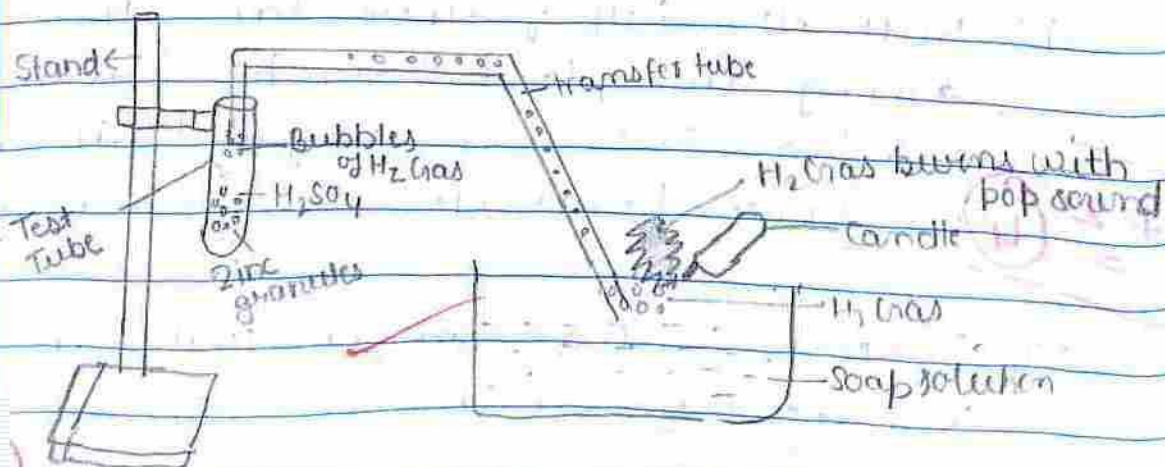
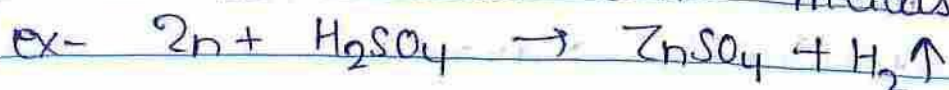
acidity and prevents from burning and
irritation.



Magnesium Hydroxide Hydrochloric acid Magnesium chloride water

(ii) Industrial development of any country is measured on the basis of consumption of sulphuric acid as it is the king of chemicals or acids. It is used widely among the other acids. ^{*}These are used ^{*}This is used in cell and car-batteries and even in petroleum products. So, the more the use of H_2SO_4 , the more the industrial development of a country.

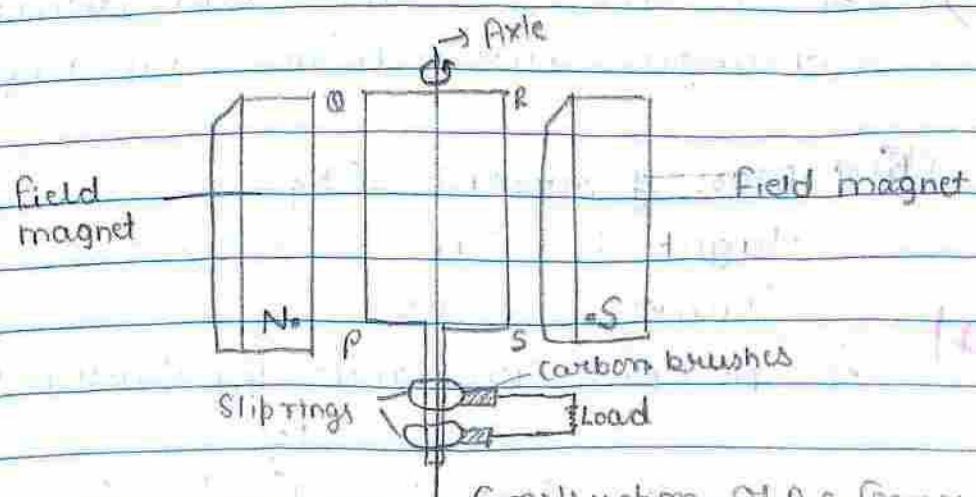
(c) Hydrogen gas is produced when the acids reacts with metals and sometimes ^{when} Bases reacts with metals.



Formation of Hydrogen gas



- (25) Construction of A.C. Generator:- A.C. generator is constructed with the help of following.
- (a) Field magnets:- Two fields magnets (cylindrical) having high strength are put around the iron core coiled with conducting wire.
 - (b) Armature coil:- The coil of iron core is taken and this is highly coiled with copper wire. More the turns more the electric current is produced.
 - (c) Slip-rings:- Two circular shapes slip rings are joined at both the ends.
 - (d) Carbon Brushes:- Two brushes of metal generally of carbon are joined with each of the slip-rings and are connected with a load.
 - (e) Axle:- An axle is placed between to rotate the coil.



Construction of A.C. Generator

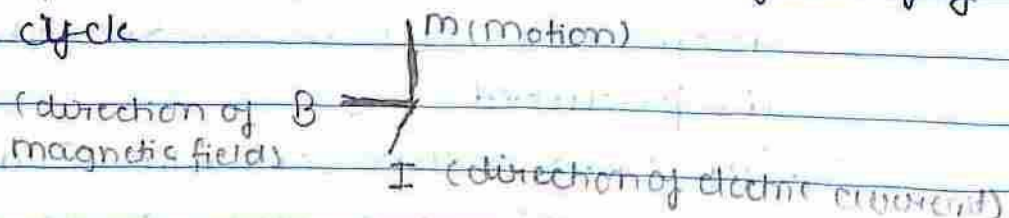
→ Working of A.C. generator:- A.C. generator works on the principle of electromagnetic induction.

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It converts the mechanical energy into electrical energy.

→ when the axle is rotated then PA moves upwards and SR moves downwards. So, magnetic flux is formed. Now, according to Fleming's right hand rule, the current flows from PARS direction in ~~off~~ half of the cycle.



Fleming's right hand rule

→ After half of the cycle, PA moves downwards and RS moves upwards. Again magnetic flux is formed and electric current is induced. At this time the direction of current is opposite in SRAP direction.

→ So, in A.C. generator the direction of current changes two times in a cycle.

(26) (a) Mass of person = 75 kg

Height = 5 m

Time = 25 sec

So, power consumed by person is $P = \frac{W}{t}$

$$\Rightarrow P = \frac{mgh}{t} = \frac{75 \times 10 \times 5}{25} = 150 \text{ watt}$$

So power consumed by person is 150 watt

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(b) Mass of block = 9 kg.

velocity of block = 4 m/s

$$\text{So } E_k (\text{kinetic energy of block}) = \frac{1}{2} m v^2 = \frac{1}{2} \times 9 \times 4 \times 4 \text{ Joule}$$
$$= 72 \text{ Joule}$$

Also, this block comes into rest by compressing the spring. So, work done by compression in spring = work done by kinetic energy of block

$$\Rightarrow \frac{1}{2} k x^2 = 72$$

$$\Rightarrow k x^2 = 72 \times 2$$

$$\Rightarrow 4 \times 10^4 x^2 = 72 \times 2$$

$$\Rightarrow x^2 = \frac{36 \times 72 \times 2}{4 \times 10^4} = \frac{36}{10^4}$$

$$\Rightarrow x = \sqrt{\frac{36}{10^4}} = \frac{6}{100} = 0.06 \text{ m.}$$

So compression in spring is 0.06 m.

(27) Genetic Diversity: The variation present between the organisms of same species due to their genetic make-up or constitution is called Genetic Diversity.

→ This type of diversity is present at gene level.

→ Genetic diversity is more than the rate of extinction of the species is less.

example- Rice is a cereal crop but among rice also various varieties are present such as- basmati, Swarandana, Sona etc.

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If Genetic diversity is more than the time period of that species increases as one or more of the species are supported by our ecosystem.

→ Two reasons of threats to biodiversity are as follows:-

(a) Habitat loss and habitat fragmentation:- Nature has provided a fix habitat for each animal. But due to their selfishness and ever increasing population of humans they are destroying the habitats of other wild animals and plants. Due to deforestation a large amount of animals & plants are on the verge of extinction. Also human has made tracks, roads, airports, railway platforms etc. Due to these many animals met with accident & loses their lives. Ex- In Sundar National park approx. half-dozen lion loses their life.

(b) Over-exploitation of natural resources:- The use of natural resources in suitable manner for fulfilling our local needs is right but the over exploitation of the resources for commercial benefits creates a lot of damage to our Biodiversity. Ex- The trade of legs of frogs has caused a great damage. Due to this government make a ban on trade of frog legs on 1st April, 1987.



(28) Excretion:- Excretion is the process of removal of poisonous waste materials ex- ammonia, urea, uric acid produced as a result of various metabolic reactions in living organisms.

→ Excretion is an essential process as in the absence of excretion human beings may die due to the storage of harmful substances.

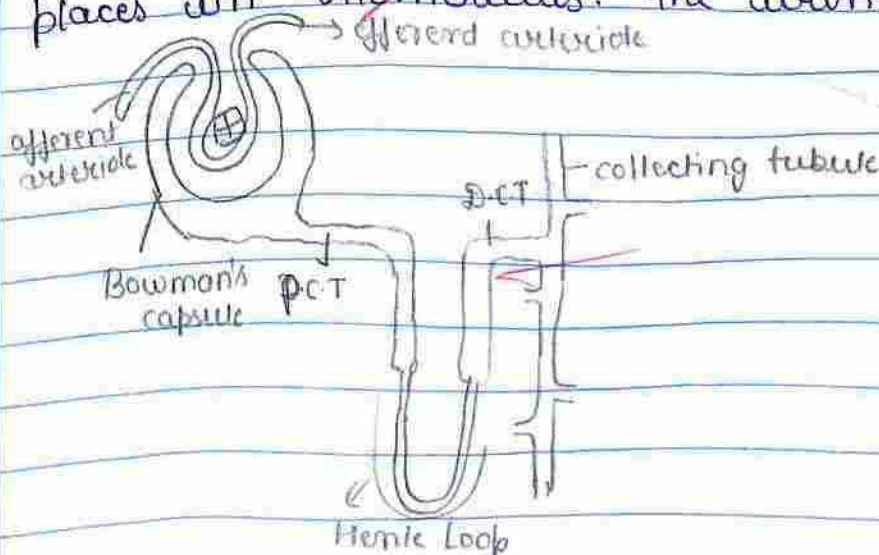
→ Excretion involves various organs such as a pair of kidney, a pair of ureter, a gall bladder, urethra and sphincters.

→ Mechanism of glomerular formation in urine formation:-

Urine is produced through three processes.

- ultrafiltration or Glomerular filtration
- Selective reabsorption
- Secretion

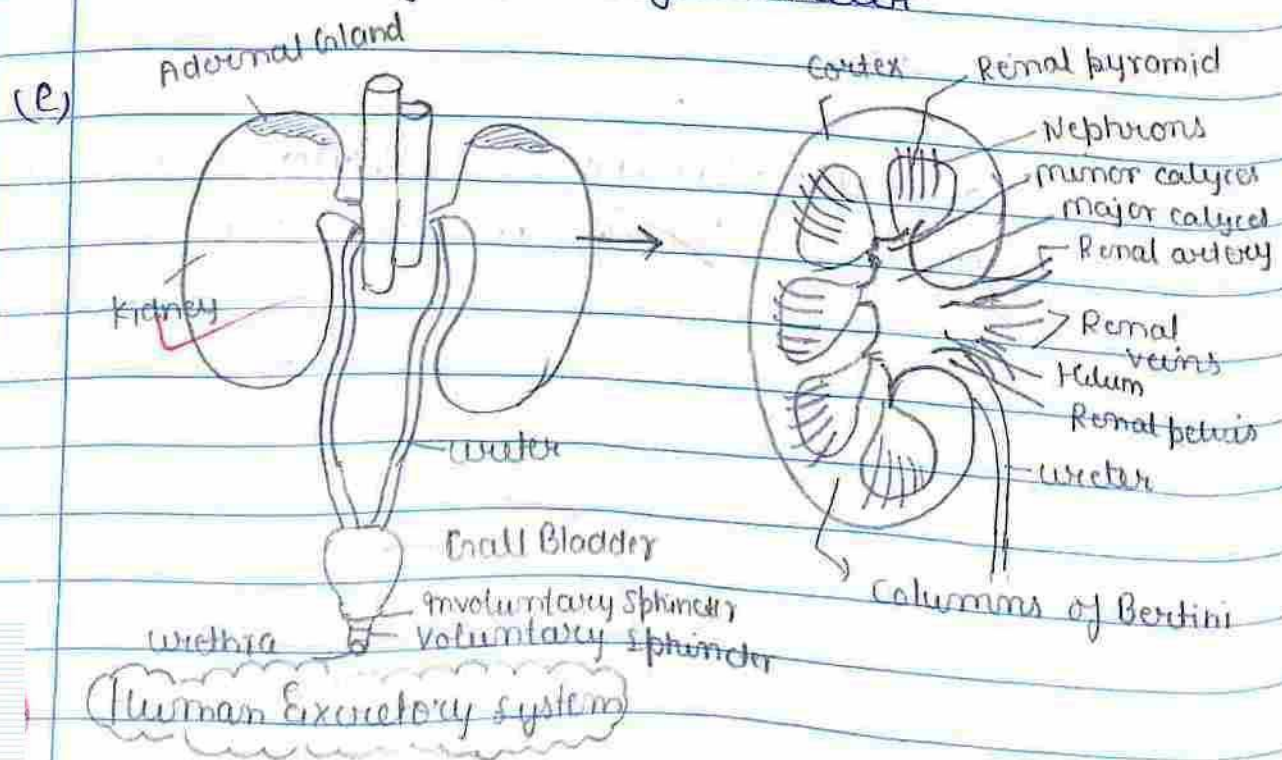
Glomerular filtration:- Glomerular filtration takes place in glomerulus. The urine is produced in



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liver. From liver it is carried to the ~~to~~ Bowman's capsule through afferent article. Here ~~the~~ Glomerulus (a tuft of capillaries) ^{is} called is present. The waste which comes from liver contains many useful substances & ions. From here, efferent article also leaves the Glomerulus. The diameter of afferent article is more than that of efferent article. Due to this a pressure difference is formed and the substances which came from liver are filtered. From here, the filtered substance containing various ions such as (Na^+ , K^+ , Cl^-) goes to Proximal convoluted tubule, Henle's loop, D.C.T and then collecting tubule and finally leaves the kidney through ureter.



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(29) (i) Metallic properties of element ^{in a period} decreases from left to right. Metallic property of any element is its property to make cations or loose electrons. When we move from left to right the atomic size of elements decreases and the effective nuclear force on the outermost electrons increases. Due to this effective nuclear charge the elements face a difficulty to make cations or loose electrons.

(2) The name of the scientist who has given a triad law of classification of elements is Dobereiner. These triads are also called triad of Dobereiner.

→ Law of triad - In his classification Dobereiner made 3-3 groups of elements in the increasing order of their atomic masses. The average or mean of the first and third elements was approximately equal to the middle element.

Ex- $\text{Li} \rightarrow 7$ (mass)
 $\text{Na} \rightarrow 23$ (mass)
 $\text{K} \rightarrow 39$ (mass)

$$\text{Here } \frac{\text{mass of Li} + \text{mass of K}}{2} = \frac{7 + 39}{2} = \frac{46}{2} = 23 = \text{mass of Na}$$

(ii) Ca, Sc, Ba

$$\frac{\text{mass of Ca} + \text{mass of Ba}}{2} = \frac{40 + 137}{2} = \frac{177}{2} = 88.5 = \text{mass of Sc}$$

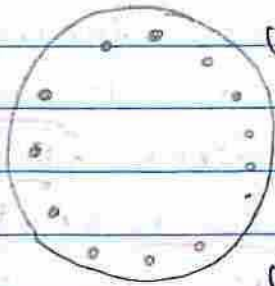
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(ii) Cl, Br, I

$$\text{Here } \frac{\text{mass of Cl}}{2} + \frac{\text{mass of I}}{2} = \frac{35.5}{2} + \frac{127}{2} = \frac{162.5}{2} = 81.25 = \text{approx. mass of Bromine}$$

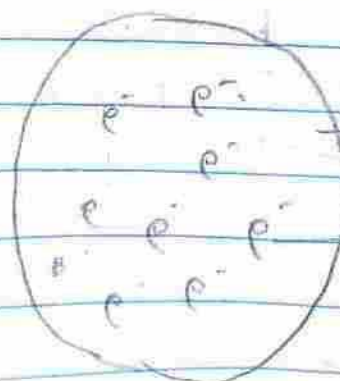
(C)



(a) The name of the atomic particle present in the sphere of represented Thomson atomic model is electron.

(b) The model of Thomson is known by different names such as- plum pudding model, cake-cream model or water melon model. According to his model an atom is a positive sphere of size 10^{-10} m. In the atom electrons are embedded in whole sphere. The total positive charge is equal to the total negative charge. So the atom is electrically neutral.

Ex) Let take the example of watermelon. In this, the red part is considered as the positive sphere and the seeds of watermelon are considered as electrons embedded in it.



positive part

electrons

Atomic model of Thomson



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(30) (a) Magnification:- The ratio of height of image to the height of object is known as magnification. OR

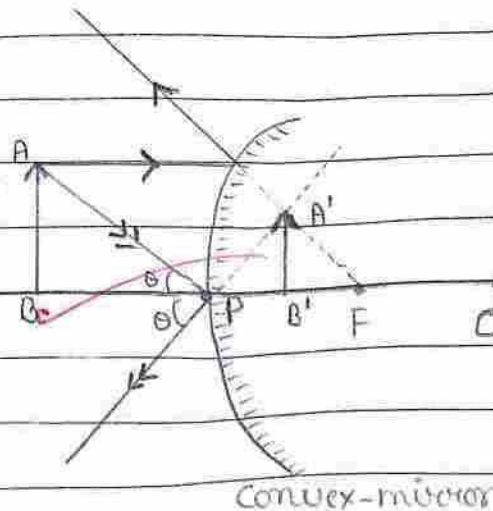
The magnification capacity of lens or mirror is called magnification.

$$\text{magnification} = \frac{h'}{h} \quad \left(\begin{array}{l} \text{height of image} \\ \text{height of object} \end{array} \right)$$

(b) Power of accommodation:- The self-adjusting capacity of focal length ^{by} of a lens to see the far or near things or objects clearly is called power of accommodation.

(b) Range of vision:- The distance between the far point and the near point of an eye is called its Range of vision.

(c)



Ray Diagram

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- 1) position of image object = b/w ∞ and pole
- 2) position of image = b/w pole and focus
- 3) Size of image = Smaller than the object
- 4) Nature of image = Erect and virtual

So, whenever an object is situated anywhere between infinity and pole of a convex mirror then the image is always formed between pole and focus and always erect, virtual and smaller than the object