

**Class-X**

**Science (086)**

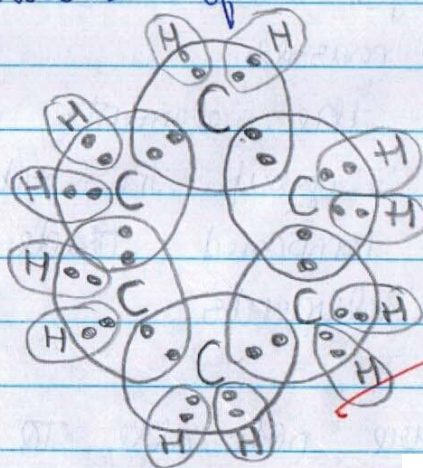
QUESTION

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SET - 1

(1) (a) Disposable Paper cups can be considered as a better alternative to plastic cups as compared to Kulhads because Kulhads can ~~cause~~ land degradation and also removal of top soil. Paper ~~is~~ <sup>can be</sup> recycled so it is a better alternative ~~to~~ plastic cups.

(2) Electron dot structure of  
= cyclo-hexane

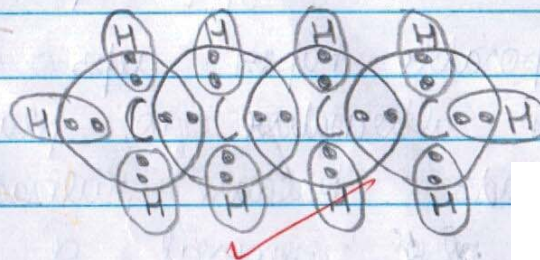


=  $C_6H_{12}$  cyclo-hexane

Butane

= PT. 0

⑥ Butane  $[C_4H_{10}]$



③ ~~Criteria~~ Criteria used by Mendeleev for creating his periodic table is =

- ① He arranged the elements in order of increasing atomic masses.
- ② He placed the elements with similar properties in same group. In order to find similarity he ~~compared~~ compared oxides and hydrides of different elements.

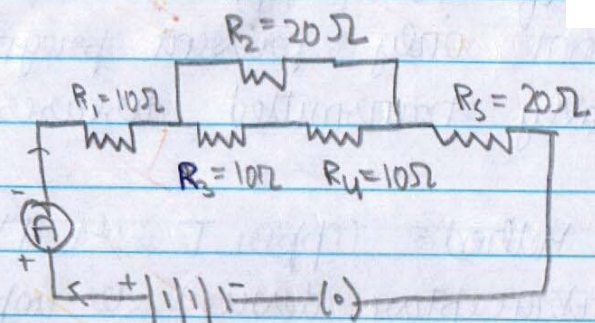
• Isotopes were not able to find position in Mendeleev's periodic table <sup>as</sup> elements were arranged in order of increasing atomic masses and isotopes have same atomic number but different atomic

QUESTION

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masses. In modern periodic table all isotopes were placed in a separate slot.

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$R_3$  and  $R_4$  are in series

So their total resistance

$$R_p = 10\Omega + 10\Omega = 20\Omega$$

$$R_p = 20\Omega$$

$R_p$  and  $R_2$  are in parallel

$$\text{So resistance} = \frac{1}{\frac{1}{20} + \frac{1}{20}} = \frac{1}{\frac{1}{R_p} + \frac{1}{R_2}}$$

$$\frac{1}{R_k} = \frac{1}{20} + \frac{1}{20} = \frac{2}{20}$$

$$R_k = \frac{20}{2} = 10\Omega$$

$R_k$ ,  $R_1$  and  $R_5$  are in series

So, total equivalent resistance =  $R_k + R_1 + R_5$

$$10\Omega + 10\Omega + 20\Omega = \boxed{40\Omega}$$

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⑤ Two ~~ways~~ contraceptive methods to control size of human population are =

① Barrier Method = Condoms can be used to prevent fusion of male gamete with female gamete. They not only prevent pregnancy but also sexually transmitted diseases.

② Mechanical Barrier Method = Copper T or IUCD (Intra Uterine Contraceptive device) is implanted in uterus which prevent fusion of male gamete with female gamete.

⑥ Sex of the children will be determined by what they inherit from their father. The sperm of father is heterogametic i.e.  $22+x$  and  $22+y$ . The egg of mother is homogametic i.e.  $22+x$ ,  $22+x$ . 23<sup>rd</sup> pair of chromosome called sex chromosome determines sex of unborn

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child. When a sperm ( $22+x$ ) fuses with egg ( $22+x$ ) then a girl is born ( $44+xx$ ). When a sperm ( $22+y$ ) fuses with egg ( $22+x$ ) then a boy is born ( $44+xy$ ). Hence sex of the children is determined by X or Y chromosomes of father.

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- Contraceptive device like copper-T or loop are placed in uterus to prevent pregnancy.
  - Oviduct or fallopian tube is blocked to prevent transfer of eggs.
  - The formation of ~~embryo~~ germ cells as ova takes place at ovary.
  - After embryo gets implanted on uterus, <sup>wall</sup> placenta helps in providing nutrition to embryo.

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SECTION-B

## SECTION-B

⑧ Human-made ecosystem are man-made or artificial eco-system where biotic and abiotic components are manipulated by human beings for interaction, for supporting life and for growing and reproducing.

An example of human-made ecosystem is aquarium.

A Human made ecosystem can become a self sustaining ecosystem if favourable conditions are provided by human beings.

For eg in aquarium if water is regularly changed, food is provided to animals.

⑨ Carbon compounds have low melting and boiling points. They have strong bond within molecule but the intermolecular forces are weak. So hence have low melting and boiling point.

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(b) Carbon compounds are formed by sharing of electrons. They have no charged particle or free valence electron. Hence they do not conduct electricity in any state.

(c) Carbon can form only covalent compounds because they cannot lose their 4 valence electrons to form  $C^{4+}$  cation as they have large atomic size and weak forces of attraction and a large energy is required to remove valence electron.

Carbon cannot gain 4 electrons to form  $C^{4-}$  anion as it is impossible for 6 protons to hold 10 electrons in its valence shell.

So ~~the~~ carbon share its 4 valence electrons with other atoms to form covalent compound.

(16)

The given table is associated with Newland's Law of Octaves.

2 important features of Newland's Law of Octaves =



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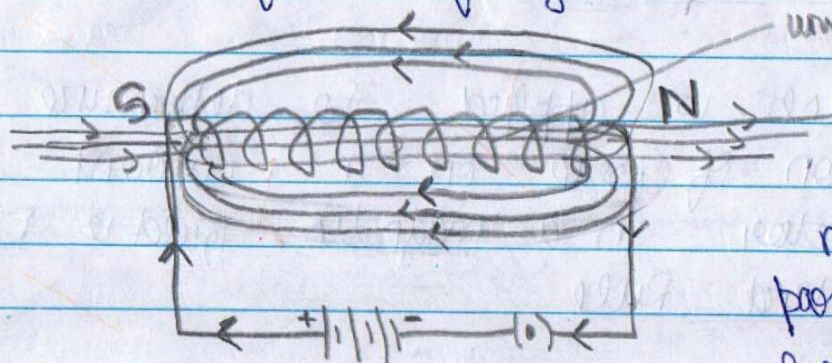
- ① Elements were arranged in the order of increasing atomic masses.
- ② The properties of every first element were found similar to the corresponding eighth elements when in order of increasing atomic masses. It was similar to seven musical tones that were getting repeated after fixed intervals.

2 Anomalies of above Newland law of Octave  
= ① This Law of Octave only worked till calcium which was at that time 17<sup>th</sup> element and for rest of elements, it did not work.

② 2 elements that were cobalt and nickel with almost different properties were placed in same slot, this was a drawback.

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Solenoid = It is a coil of many circular turns of insulated copper wire wrapped closely in the form of cylinder.



uniform magnetic field inside coil.

Inside the coil the lines of magnetic field are parallel, so magnetic field is uniform inside the coil.

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① When current through ABCD is passed AB will experience a downward force. CD will experience an upward force.

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~~band~~ P and Q reverses the flow of current in coil ABCD. Their name is split surge.

(iii) After reversal of flow of current in coil AB CD, side AB will move upwards, side CD will move downwards.

(iv) Rule which is applied to determine the direction of force on a current carrying conductor in a magnetic field is Fleming's Left Hand Rule.

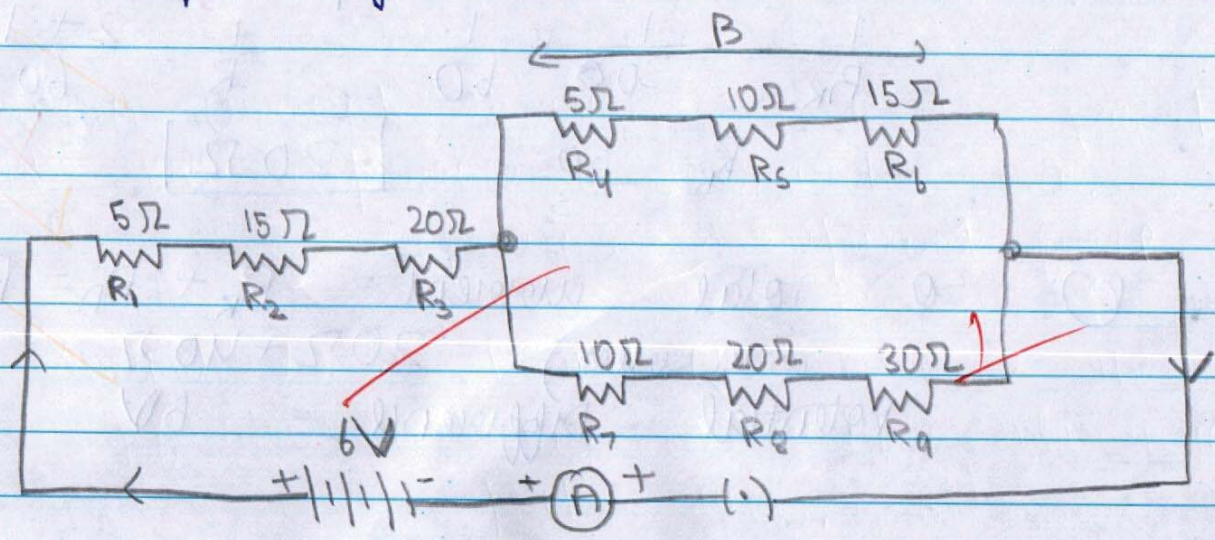
(v) With the help of Di-Hybrid cross, Mendel showed that the traits are inherited independently. He did this experiment to study inheritance of factors of ~~only~~ two characters of parent plant. For eg colour of seed, shape of seed. He cross pollinated two plants, one having round yellow seeds and other having green

# QUESTION

wrinkled seeds. He found all the plants in  $f_1$  generation were round yellow. Then he self pollinated the plants and ~~found~~ four different kinds of seeds of plant were ~~found~~ in  $f_2$  generation 4 different kinds of seed were Round yellow ; Round green ; wrinkled yellow ; wrinkled green in the ratio  $9:3:3:1$ .

Thus he showed that traits are inherited independently.

(14)



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(a) Equivalent resistance of Arm A =

$$R_A = R_1 + R_2 + R_3 \quad (\text{as in series})$$

$$R_A = 5\Omega + 15\Omega + 20\Omega$$

$$R_A = 40\Omega$$

So equivalent resistance <sup>(Arm A)</sup> is  $\boxed{40\Omega}$

(b)  $R_B = 5\Omega + 10\Omega + 15\Omega = 30\Omega$   
(as in series)

$$R_C = 10\Omega + 20\Omega + 30\Omega = 60\Omega$$

(as in series)

$R_B$  and  $R_C$  are in parallel

$$\frac{1}{R_{\text{eq}}} = \frac{1}{30} + \frac{1}{60} = \frac{1}{R} = \frac{2+1}{60}$$

$$R_{\text{eq}} = \frac{60}{3} = \boxed{20\Omega}$$

(c) So total current =  $R_{\text{eq}} + R_A = R$

(as in series)  $20\Omega + 40\Omega = 60\Omega$

Potential Difference = 6V

By Ohm Law  $V = IR$   $b = I \times 60$

$$I = \frac{6}{60} = I = \frac{1}{10} \text{ A} \text{ or } 0.1 \text{ Ampere}$$

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(a) Leishmania is the name of organism in which binary fission takes place under fixed orientation.

The disease caused by this organism is Kala-azar.

(b) 2 advantages of plants ~~to~~ producing through vegetative reproduction are

(1) New Plants are genetically similar to parent plant. Plants grown by this method show early flowering.

(2) It is used method to grow plants which do not bear seeds.

REPRODUCTION

(C) Budding is a asexual method of reproduction taking place in multicellular organisms like hydra. A bud grows on parent organism which contain regenerative cells. The buds develops into a new individual and detach itself from parent organism to live like a new organism.

