Preboard Term -2 2022

Class 10

General Science

Instructions:

i) All questions are compulsory.

ii) The question paper has three sections and 15 questions. All questions are compulsory.

iii) Section–A has 7 questions of 2 marks each; Section–B has 6 questions of 3 marks each; and Section–C has 2 case based questions of 4 marks each.

iv) Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

Section A

Q1. State reasons to explain why covalent compounds:

A. are bad conductors of electricity?

B. have low melting and boiling points? 2

Q2. An element M has the atomic number 12.

a. Write its electronic configuration.

b. State the group to which M belongs.

c. Is M a metal or a non-metal?

d. Write the formula of its oxide. 2

Q3. Name the male and female sex hormone and write their role. 2M

Q4. Draw diagram showing pollen germination on stigma and label male gametes and egg cell only. 2M

Q5. Describe, what ensues the stability of DNA in a species? 2M

6.(a) Magnetic lines of force of two pairs of magnets are shown in figure A and B. Out of these two figures, which one represents the correct pattern of field lines. Name the poles of magnets facing each other.

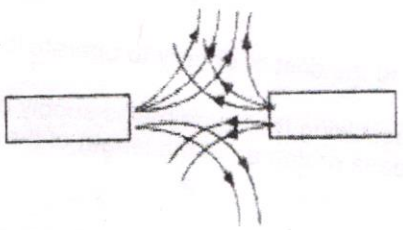


Figure A

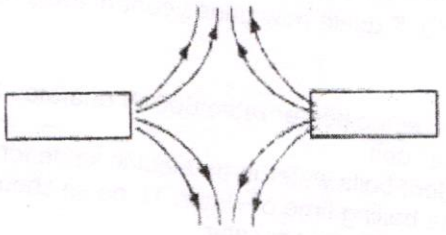


Figure B

(b) A student performs an experiment to study the magnetic effect of current around a current carrying straight conductor. He reports that

A. the direction of deflection of the north pole of a compass needle kept at a given point near the conductor remains unaffected even when the terminals of the battery sending current in the wire are interchanged.

B. for a given battery, the degree of deflection of a N-pole decreases when the compass is kept at a point farther away from the conductor. Which of the above observations of the student is incorrect and Why ?

OR

A coil of insulated copper wire is connected to a galvanometer. What would happen if a bar magnet is
(i) Pushed into the coil?
(ii) Withdrawn from inside the coil?
(iii) Held stationary inside the coil? (2)

Q7. Why food chain generally consists of 3-4 steps only?

OR

Write two points of importance of decomposers in an ecosystem. 2M

Section B

Q8. A. Predict the maximum number of valence electrons possible for atoms in the first period of the periodic table.
B. State Mendeleev's periodic law.
C. Name any two elements which were discovered later after the formation of Mendeleev's periodic table. 3

Q9. A. Draw electron dot structures of (i) C2H2 (ii) C3H6.
B. How many isomers are formed by Pentane

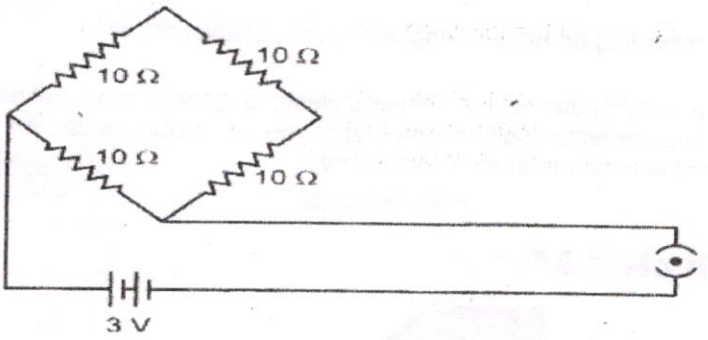
OR

A. Draw structural formulas of all the isomers of Butane and give their IUPAC names. 3
B. Name an allotrope of carbon used as a greasing agent.

Q10. Explain how genes control traits with an example. 3M

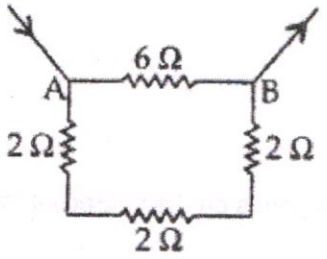
11.(a) An electric heater rated 800 W operates 6h/day. Find the cost of energy to operate it for 30 days at Rs 3.00 per unit.
(b) A student boils water in an electric kettle for 20 minutes. Using the same mains supply he wants to reduce the boiling time of water. To do so should he increase or decrease the length of the heating element? Justify your answer (3)

12. Find the equivalent resistance and the current drawn from the battery by the network of four resistors Shown in the figure.



OR

(a) Find the resistance between points A and B in the circuit diagram given below:



(b) How is the resistance of a wire affected if – (i) its length is doubled, (ii) its radius is doubled? (3)

Q13. A) Define Food chain

B) Expand the term UNEP. What was it's purpose? 1+2 M

Section –C

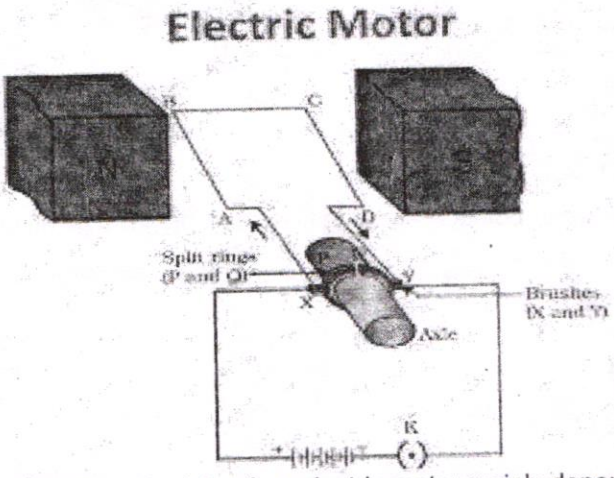
Q14. What happens when pea plants showing two different characteristics rather just one are bred with each other? What does the progeny of a tall plant with round seeds crossed with a dwarf plant with wrinkled seeds look like? They are all tall and with round seeds. Tallness and round seeds are thus dominant traits. But what happens when these F1 progeny are used to generate F2 progenyby self pollination? A Mendelian experiment will find that some F2 progeny are tall plants with round seeds and some were short plants with wrinkled seeds, while others would be short but have round seeds. You can see as to how new combinations of traits are formed in F2 offsprings, when factors controlling for seed shape and seed color recombine to form zygote leading to form F2 offsprings. Thus the tall/short trait and the round seed/ wrinkled seed trait are independently inherited.

Answer the following questions

A) Make a cross to explain the independent inheritanceof two above said characteristics.
B) Write the F2 result with ratio for this cross.
C) Which characteristics are reccessive in the above cross. 2+1+1M

15. Based on your understanding of the following paragraph, answer the following questions:

An electric motor is a rotating device that converts electrical energy into mechanical energy. In your house, almost every mechanical movement that you see around is caused by an electric motor. The diagram of electric motor is shown below:



The working principle of an electric motor mainly depends on the interaction of magnetic and electric field.

In the example above, coil ABCD is horizontal and the battery is connected as shown.

a. For this position, state the direction of the force on the arm AB.
b. Why does the current in the arm BC not contribute to the turning force on the coil?
c. What is the function of split ring in an electric motor?
d. State the principle of electric motor.

(4)