SAMPLE PAPER – 2

TIME : 2 HRS.   **MAX. MARKS : 40**

GENERAL INSTRUCTIONS :

1. **All questions are compulsory.**

2. **The questions paper has three sections and 15 questions.**

3. **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.**

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

5. **Wherever necessary, neat and properly labelled diagrams should be drawn.**

SECTION-A

1. Differentiate between alkanes and alkenes. Name and draw the structure of one member of each.

2. Choose from the following :

    $_6C, _8O, _{10}Ne, _{11}Na, _{14}Si$

    (i) Elements that should be in the same period.

    (ii) Elements that should be in the same group.

    State reason for your selection in each case.

3. Name the following:

    (a) 'Blobs' that develop at the tips of the non-reproductive threads in Rhizopus.

    (b) Explain the function of the structures released from the 'blobs' in Rhizopus.

4. (a) In humans, if gene B gives brown eyes and gene b gives blue eyes, what will be the colour of eyes of the persons having the following combination of genes ?

    (i) Bb   (ii) bb   (ii) BB

    (b) What do you class this trait of eye colour in human ? Explain.

5. In Mendel's experiment of inheritance in which he took two contrasting characters, i.e., round green and wrinkled yellow seeds.

    (a) What was the phenotype of offsprings in F_1-generation?

    (b) What was the ratio of offsprings in F_2-generation?

    <div align="center">OR</div>

    Explain Mendel's observation when the crossed a homozygous tall (TT) plant with homozygous dwarf (tt) plant followed by self-cross.

6. Draw magnetic lines of force for a current carrying solenoid. Also, explain the pole formation at its ends.

    <div align="center">**OR**</div>

    Is there a similar magnetic field produced around a thin beam of moving

    (a) alpha particles and (b) neutrons? Justify your answer.

7. What is ten percent law? Give an example to explain it.

<div align="center">OR</div>

(a) Why Energy transfer is said to be unidirectional ?

(b) Write any two significance of food chain?

<div align="center">

SECTION-B

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8. (i) Write the molecular formula of the 2nd and the 3rd member of the homologous series whose first member is methane.

(ii) Write the general formula of hydrocarbon alkene. Write the name of simplest alkene.

(iii) Write the molecular formula of first two members of homologous series with functional group–OH.

9. An element 'X' belongs to 3rd period and group 16 of the Modern Periodic Table.

(i) Determine the number of valence electrons and the valency of 'X'.

(ii) Molecular formula of the compound when 'X' reacts with hydrogen and write its electron dot structure.

(iii) Name the element 'X' and state whether it is metallic or non-metallic.

<div align="center">**OR**</div>

(a) Define the following terms:

(i) Valency;   (ii) Atomic size

(b) How do the valency and the atomic size of the elements vary while going from left to right along a period in the Modern Periodic Table?

10. Two plants, A with white flowers and B with red flowers were crossed. The F_1 progeny shows all red flowers and F_2 has three red and one white. Categorise the trait as dominant and recessive.

11. Nichrome wire of length 'L' and radius 'R' has resistance of $10\ \Omega$. How would the resistance of the wire change when :

(i) Only length of the wire is doubled with keeping its other dimensions constant?

(ii) Only diameter of the wire is doubled with keeping its other dimensions constant?

Justify your answer.

12. (i) Write the principle of working of an electric motor.

(ii) Explain the function of the following parts of an electric motor :

(a) Armature   (b) Brushes

(iii) Name two devices in which an electric motor is used.

<div align="center">**OR**</div>

(i) Explain why two magnetic lines do not intersect each other.

(ii) State the rule for determining the direction of the magnetic field produced around a straight current carrying conductor. Draw a sketch of the pattern of field lines due to a current flowing through a straight conductor.

(iii) Explain on what factors does the magnetic field produced by a straight current carrying carying conductor depends.

13. A food web is given below, observe the figure and answer the questions given below.
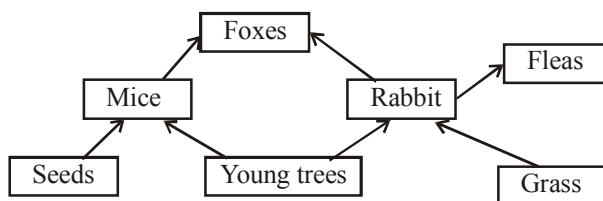
(a) Identify the primary consumer in the food web.

(b) If all the foxes are killed due to a disease, what will your observations about food web be?


SECTION-C

This section has 02 case based questions (Q.14 & 15). Each case is followed by 03 sub-questions (a, b & c). Parts a and b are compulsory. However, an internal choice has been provided in part c.

14. A married woman used a device X mode of common metal for preventing pregnancy. This device was put into her uterus by some trained medical professional. Unfortunately she got pregnant after two montsh of insertion of device. She was in shock to learn that her birth control device has failed.

(a) What is the name of birth control device used by the woman?

(b) Which metal is commonly used for making device X?

(c) How does device X prevent pregnancy ?

OR

What do you think the woman got pregnant even after using device X?

15. A student performs an experiment on the series combination of two different resistors. He arranged a battery of 9 V, an ammeter, a voltmeter, a resistor of 15 Ω and another resistor R of unknown value. He completed an electric circuit as shown below.
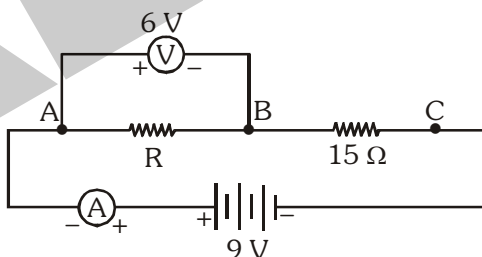
Based on the above information, answer the following questions:

(a) What is the resistance of unknown resistor R?

(b) If both the resistors are connected in parallel to the same battery, what will be the current supplied by the battery?

(c) Calculate the power consumed by each resistor in their series combination.

OR

Find the heat dissipated by each resistor in 20 seconds when both are connected in parallel combination, supplied by the same battery.