

Series : QQDRR/4



SET-3

प्रश्न-पत्र कोड 31/4/3
Q. P. Code

रोल नं.

Roll No.

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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।

Candidates must write the Q.P. Code on the title page of the answer-book.

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 16 हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में 15 प्रश्न हैं।
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें।
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।
- Please check that this question paper contains 16 printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 15 questions.
- **Please write down the Serial Number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidate will read the question paper only and will not write any answer on the answer-book during this period.



विज्ञान SCIENCE

निर्धारित समय : 2 घण्टे

Time allowed : 2 hours

अधिकतम अंक : 40

Maximum Marks : 40

31/4/3

136 C

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P.T.O.

General Instructions :

Read the following instructions carefully and strictly follow them :

- (i) *This question paper contains **15** questions. **All** questions are compulsory.*
- (ii) *This question paper is divided into **three** Sections viz. Section **A**, **B** and **C**.*
- (iii) *Section **A** - Question numbers **1** to **7** are short answer type questions. Each question carries **two** marks.*
- (iv) *Section **B** - Question numbers **8** to **13** are also short answer type questions. Each question carries **three** marks.*
- (v) *Section **C** – Question No. **14** and **15** are case based questions. Each question carries **four** marks.*
- (vi) *Internal choices have been provided in some questions. Only one of the alternatives has to be attempted.*

SECTION – A

1. Differentiate between the process of binary fission and multiple fission giving an example of each. **2**

2. “The improvement in our lifestyle has led to the generation of large amount of waste material.” List two reasons to justify this statement. **2**

OR

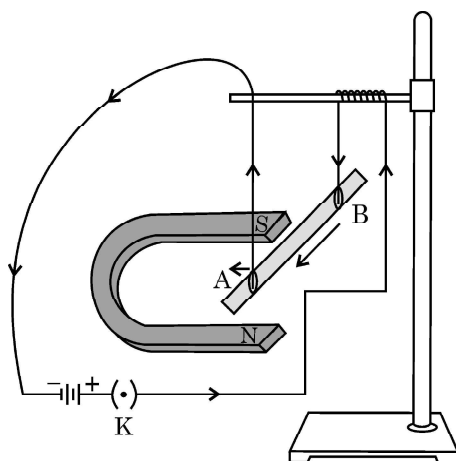
“The change in packaging has resulted in waste becoming non-biodegradable.”

Giving two examples from daily life, justify this statement.



3. As shown in the diagram an aluminium rod 'AB' is suspended horizontally between the two poles of a strong horse shoe magnet in such a way that the axis of rod is horizontal and the direction of the magnetic field is vertically upward. The rod is connected in series with a battery and a key.

2



State giving reason :

- (a) What is observed when a current is passed through the aluminum rod from end B to end A ?
- (b) What change is observed in a situation in which the axis of the rod 'AB' is moved and aligned parallel to the magnetic field and current is passed in the rod in the same direction ?

OR

“Magnetic field is a physical quantity that has both direction and magnitude.” How can this statement be proved with the help of magnetic field lines of a bar magnet ?

4. Give the criteria on the basis of which elements are placed (i) in a group and (ii) in a period in the modern periodic table. The atomic number of an element is 16. According to the criteria, in which group and period it should be placed ?

2



5. Consider the carbon compounds having following molecular formula : 2
- (i) C_3H_6 (ii) C_3H_8 (iii) C_4H_6 (iv) C_6H_6 (v) C_6H_{12}
- (a) State the number of double covalent bonds present in C_3H_6 .
- (b) Write the formula of first member of the homologous series to which the carbon compound C_4H_6 belongs.
- (c) Which one of the above compounds forms ring structure of carbon atoms ?
- (d) Identify, which of the above compounds, is a member of alkane series.
6. Consider the carbon compounds having following molecular formula : 2
- (i) C_2H_2 (ii) C_2H_6 (iii) C_3H_7OH (iv) C_2H_5COOH (v) CH_3CHO
- (a) Identify which one of the above compounds, is a member of aldehyde series.
- (b) Write the general formula of the series to which compound C_2H_2 belongs.
- (c) Which one of the above compounds has triple bonds between carbon – carbon atoms ?
- (d) Write the molecular formula of the first member of the homologous series to which the compound C_3H_7OH belongs.
7. Using height (tallness / dwarfness) of a plant as an example, show that genes control the characteristics or traits in an organism. 2

OR

In a cross between red coloured and white coloured flowers, when plants with red coloured flowers of F₁ generation were self pollinated, plants of F₂ generation were obtained in which 75% of plants were with red flowers and 25% plants were with white flowers.

Explain the inheritance of traits in the above cross with the help of a flow chart only along with the ratio of plants obtained.

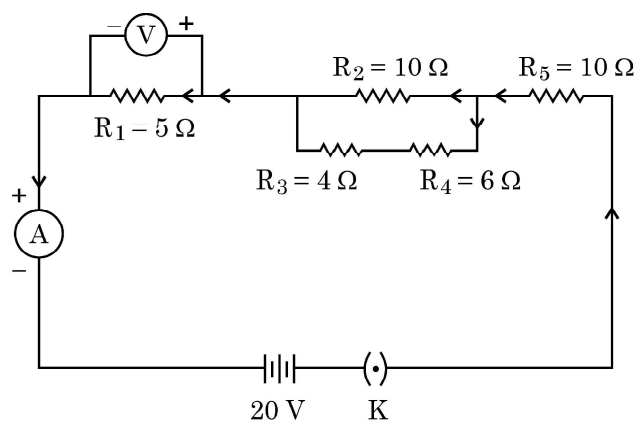


SECTION – B

8. (a) Write the relationship between electrical resistance and electrical resistivity for a metallic conductor of cylindrical shape. Hence derive the SI unit of electrical resistivity. 3
- (b) Find the resistivity of the material of a metallic conductor of length 2m and area of cross-section $1.4 \times 10^{-6} \text{m}^2$. The resistance of the conductor is 0.04 ohm.
9. An electric motor rated 1100 W is connected to 220 V mains. Find : 3
- (i) The current drawn from the mains,
- (ii) Electric energy consumed if the motor is used for 5 hours daily for 6 days.
- (iii) Total cost of energy consumed if the rate of one unit is ₹ 5.

OR

Study the following circuit and find :



- (i) Effective resistance of the circuit
- (ii) Current drawn from the battery
- (iii) Potential difference across the 5Ω resistor



-
10. Name the elements whose compounds formed the basis of classification in Mendeleev's periodic table. Why did Mendeleev choose these elements ? **3**

How the formulae of these compounds had helped Mendeleev in deciding the position of an element in his periodic table ?

11. In 1987, the United Nations Environment Programme (UNEP) forged an agreement to freeze the production of a certain chemical to year 1986 level. Name the chemical and the manufacturing companies in which this chemical was being mostly used.

In what way this chemical damages (i) the upper layers of the atmosphere and ultimately (ii) the organisms on the earth. **3**

12. In flowering plants, the pollen grains are transferred to stigma by pollination but the female germ cells are present in the ovary. Explain with the help of a labelled diagram (only concerned parts), how the male germ cell reaches the ovary. **3**

13. "Two different forms of carbon – diamond and graphite have different structures and very different physical properties even though their chemical properties are same." Explain why. **3**

OR

State the reasons, why carbon cannot

- (i) Lose four electrons to form C^{4+} cation, and
- (ii) Gain four electrons to form C^{4-} anion.

How does carbon overcome this problem to form compounds ?



SECTION – C

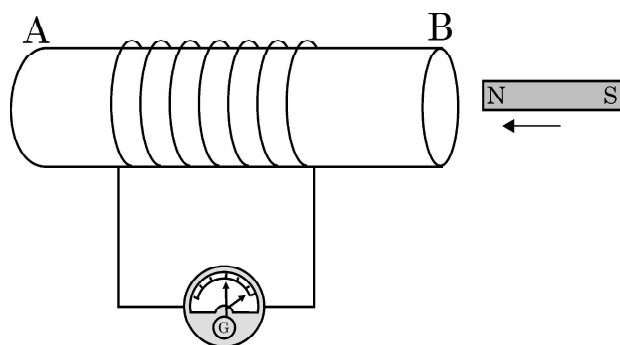
This section has 02 case based questions (14 and 15).

Each case is followed by **03** sub-questions (a, b and c).

Part (a) and (b) are compulsory. However an internal choice has been provided in Part (c).

14. AB is a coil of copper wire having a large number of turns. The ends of the coil are connected with a galvanometer as shown. When the north pole of a strong bar magnet is moved towards the end B of the coil, a deflection is observed in the galvanometer.

4



- (a) What is a galvanometer ? Why does its needle deflects when magnet is moved towards the coil to which it is connected ?
- (b) What would be observed in the galvanometer in a situation when the coil and the bar magnet both move with the same speed in the same direction ? Justify your answer.
- (c) State the conclusion that can be drawn from this activity.

Will there be any change in the momentary deflection in the galvanometer if number of turns in the coil is increased and a more stronger magnet is moved towards the coil ?

OR



What is electromagnetic induction ? What is observed in the galvanometer when a strong bar magnet is held stationary near one end of a coil of large number of turns ? Justify your answer.

15. Sex of an individual is determined by different factors in various species. Some animals rely entirely on the environmental cues, while in some other animals the individuals can change their sex during their life time indicating that sex of some species is not genetically determined. However, in human beings, the sex of an individual is largely determined genetically.

4

- (a) What is the statistical probability of getting either a male child or a female child ?
- (b) Write the number of pair/pairs of sex chromosomes present in human beings. In which one of the parent (male / female) perfect pair / pairs of sex chromosomes are present ?
- (c) Citing two examples, justify the statement “Sex of an individual is not always determined genetically”.

OR

Draw a flow chart to show that sex is determined genetically in human beings.



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16

