SCIENCE QUESTION PAPER

2025

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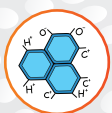
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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें ।
Candidates must write the Q.P. Code on the title page of the answer-book.

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **11** हैं ।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी 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 **11** 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 students 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*

अधिकतम अंक : 40

Time allowed : 2 hours

Maximum Marks : 40

General Instructions :

Read the following instructions very carefully and strictly follow them :

*(i)   This question paper comprises **15** questions. **All** questions are compulsory.*

*(ii)   This question paper is divided into **three** sections – **A**, **B** and **C**.*

*(iii)   **Section A** – Questions No. **1** to **7** are short answer type questions. Each question carries **2** marks.*

*(iv)   **Section B** – Questions No. **8** to **13** are also short answer type questions. Each question carries **3** marks.*

*(v)   **Section C** – Questions No. **14** and **15** are case-based questions. Each question carries **4** marks.*

(vi)   Internal choices have been provided in some questions. Only one of the alternatives has to be attempted.

SECTION A

1. (a) Write the molecular formula of the following carbon compounds :
        (i)   Methane
        (ii) Propane
    (b) Carbon compounds have low melting and boiling points. Why ?   *2*

2. The electrons in the atoms of two elements X and Y are distributed in three shells having 1 and 7 electrons respectively in their outermost shells.
    (a) Write the group numbers of these elements in the Modern Periodic Table.
    (b) Write the molecular formula of the compound formed when X and Y combine with each other.
    (c) Which of the two is electropositive ?   *2*

3. (a) Which of the following flowers will have higher possibility of self-pollination ?

                 Mustard, Papaya, Watermelon, Hibiscus

    (b) List the two reproductive parts of a bisexual flower.   *2*

4. Which one of the two multicellular organisms — Spirogyra and Planaria reproduces by regeneration and why ? Give an example of any other organism which can also reproduce by the same process.   *2*

31/1/1   2   P.T.O.

_____

5. (a) What is variation ? List two main reasons that may lead to variation in a population. *2*

OR

(b) (i) In a cross between violet flowered plants and white flowered plants, state the characteristics of the plants obtained in the F_1 progeny.

(ii) If the plants of F_1 progeny are self-pollinated, then what would be observed in the plants of F_2 progeny ?

(iii) If 100 plants are produced in F_2 progeny, then how many plants will show the recessive trait ? *2*

6. (a) (i) Name and state the rule to determine the direction of force experienced by a current carrying straight conductor placed in a uniform magnetic field which is perpendicular to it.

(ii) An alpha particle while passing through a magnetic field gets projected towards north. In which direction will an electron project when it passes through the same magnetic field ? *2*

OR

(b) (i) What is a solenoid ?

(ii) Draw the pattern of magnetic field lines of the magnetic field produced by a solenoid through which a steady current flows. *2*

7. (a) What is ozone ? How is it formed in the upper layers of the Earth's atmosphere ? How does ozone affect our ecosystem ? *2*

OR

(b) (i) List two human-made ecosystems. *1*

(ii) "We do not clean a pond in the same manner as we do in an aquarium." Give reason to justify this statement. *1*

SECTION B

8. (a) List two advantages of adopting the atomic number of an element as the basis of classification of elements in the Modern Periodic Table.

   (b) Write the electronic configurations of the elements X (atomic number 13) and Y (atomic number 20). *3*

9. (a) Draw two different possible structures of a saturated hydrocarbon having four carbon atoms in its molecule. What are these two structures of the hydrocarbon having same molecular formula called ? Write the molecular formula and the common name of this compound. Also write the molecular formula of its alkyne. *3*

OR

   (b) (i) Write the molecular formula of benzene and draw its structure.

   (ii) Write the number of single and double covalent bonds present in a molecule of benzene.

   (iii) Which compounds are called alkynes ? *3*

10. (a) Mention one function each of the following organs in human male reproductive system :
   (i) Testis
   (ii) Scrotum
   (iii) Vas deferens
   (iv) Prostate gland

   (b) Name the type of germ cell which (i) is motile, and (ii) stores food. *3*

11. (a) Three resistors R_1, R_2 and R_3 are connected in parallel and the combination is connected to a battery, an ammeter, a voltmeter and a key. Draw suitable circuit diagram to show the arrangement of these circuit components along with the direction of current flowing.

   (b) Calculate the equivalent resistance of the following network : *3*

$$R_2 = 10 \; \Omega$$
$$R_1 = 5 \; \Omega \qquad R_4 = 5 \; \Omega$$
A $\quad$ C $\quad R_3 = 10 \; \Omega \quad$ D $\quad$ B
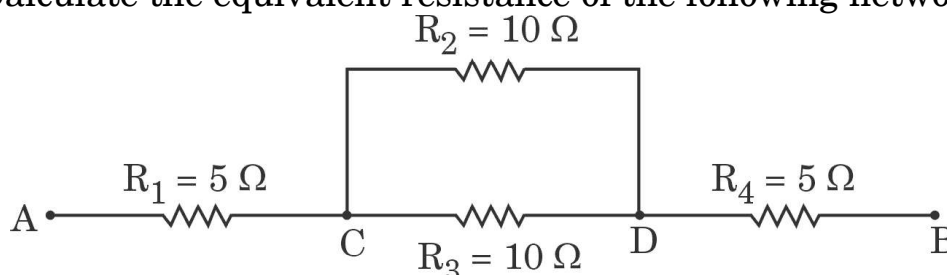
12. (a) (i) Define Electric Power and write its SI unit. $\frac{1}{2} + \frac{1}{2}$

(ii) Two bulbs rated 100 W; 220 V and 60 W; 220 V are connected in parallel to an electric mains of 220 V. Find the current drawn by the bulbs from the mains. *2*

OR

(b) (i) State Joule's law of heating. Express it mathematically when an appliance of resistance R is connected to a source of voltage V and the current I flows through the appliance for a time t.

(ii) A 5 Ω resistor is connected across a battery of 6 volts. Calculate the energy that dissipates as heat in 10 s. *3*

13. (a) Name the group of organisms which form in the first trophic level of all food chains. Why are they called so ?

(b) Why are the human beings most adversely affected by bio-magnification ?

(c) State one ill-effect of the absence of decomposers from a natural ecosystem. *3*

SECTION C

*This section has **2** case-based questions (**14** and **15**). Each case is followed by **3** sub-questions (a), (b) and (c). Parts (a) and (b) are **compulsory**. However, an internal choice has been provided in Part (c).*

14. The mechanism by which the sex of an individual is determined is called sex-determination. In human beings, sex of a newborn is genetically determined, whereas in some others it is not. There are 46 (23 pairs) chromosomes in human beings. Out of these, 44 (22 pairs) control the body characters and 2 (one pair) are known as sex chromosomes. The sex chromosomes are of two types — X chromosome and Y chromosome. At the time of fertilisation, depending upon which type of male gamete fuses with the female gamete, the sex of the newborn child is decided.

(a) Why is a pair of sex chromosomes in human beings called a mismatched pair in terms of type and size ? $\frac{1}{2} + \frac{1}{2}$

(b) Out of male or female, which of them has a perfect pair of sex chromosomes ? In case of a perfect pair, will the gametes produced be of the same kind or of a different kind ? *1*

(c) (i) Name two animals whose sex is not genetically determined. Explain the process of their sex determination. *1+1*

OR

(ii) With the help of a flowchart only, show how sex is genetically determined in human beings. *1+1*

15. A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt-sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.

(a) Draw a diagram to show this pattern of iron filings. *1*

(b) Draw the magnetic field lines of a bar magnet showing the poles of the bar magnet as well as the direction of the magnetic field lines. *1*

(c) (i) How is the direction of magnetic field at a point determined using the field lines ? Why do two magnetic field lines not cross each other ? *2*

OR

(ii) How are the magnetic field lines of a bar magnet drawn using a small compass needle ? Draw one magnetic field line each on both sides of the magnet. *2*

Deeksha's balanced approach to PU and JEE prep, with weekly assessments and dedicated hours, refined my strategy. Supportive teachers and a great learning environment made all the difference.

P Sai Lekhya Deeksha Vedantu Vidyanagar 2022-24 (Science)

★★★★★

Admission to Deeksha was transformative. The VidyaDaan scholarship enabled my PU studies, while my teachers instilled skills in technology and time management. Confident in my preparation, I aim to clear the CA Foundation exam by 2025.

Shamsudin, Deeksha Vedantu Kengeri 2022-24 (Comm.)

★★★★★

With Deeksha's expert guidance, I effectively balanced JEE and PU preparation, achieving a 99.59 percentile in JEE Main. The weekly tests, model papers, and bite-sized materials were instrumental in mastering PU topics and staying exam-ready.

Neha Prabhu, Deeksha Main Campus 2022-24 (Science)

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