Series QQARR/1

रोल नं.
Roll No.

SET-3

प्रश्न-पत्र कोड
Q.P. Code **31/1/3**

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
Time allowed : 2 hours

अधिकतम अंक : 40
Maximum Marks : 40

सामान्य निर्देश :

निम्नलिखित निर्देशों को बहुत सावधानी से पढ़िए और उनका सख़्ती से पालन कीजिए :

(i) इस प्रश्न-पत्र में कुल **15** प्रश्न हैं । **सभी** प्रश्न अनिवार्य हैं ।

(ii) यह प्रश्न-पत्र **तीन** खण्डों में विभाजित किया गया है – **क, ख** एवं **ग** ।

(iii) **खण्ड क** – प्रश्न संख्या **1** से **7** तक लघु-उत्तरीय प्रकार के प्रश्न हैं । प्रत्येक प्रश्न **2** अंकों का है ।

(iv) **खण्ड ख** – प्रश्न संख्या **8** से **13** भी लघु-उत्तरीय प्रकार के प्रश्न हैं । प्रत्येक प्रश्न **3** अंकों का है ।

(v) **खण्ड ग** – प्रश्न संख्या **14** और **15** प्रकरण-आधारित प्रश्न हैं । प्रत्येक प्रश्न **4** अंकों का है ।

(vi) कुछ प्रश्नों में आंतरिक चयन प्रदान किया गया है । इस प्रकार के प्रश्नों में केवल एक ही विकल्प का उत्तर दीजिए ।

खण्ड क

1. दो तत्व A और B आधुनिक आवर्त सारणी के तीसरे आवर्त के तत्व हैं । तत्व A पहले समूह का है जबकि तत्व B 16वें समूह का है ।

प्रत्येक उत्तर की पुष्टि करते हुए A और B के नीचे दिए गए लक्षणों की तुलना कीजिए : *2*

(क) परमाणु साइज़

(ख) धात्विक लक्षण

2. किसी अधातु 'X' की परमाणु संख्या 8 है । *1+1*

(क) तत्व 'X' की आवर्त संख्या तथा समूह संख्या लिखिए ।

(ख) तत्व 'X' के अणु की इलेक्ट्रॉन बिंदु संरचना खींचिए ।

3. दो बहुकोशिक जीवों — स्पाइरोगायरा और प्लेनेरिया में से कौन पुनर्जनन (पुनरुद्भवन) द्वारा जनन करता है और क्यों ? किसी एक अन्य ऐसे जीव का उदाहरण दीजिए जो इसी प्रक्रिया द्वारा जनन कर सकता है । *2*

4. (क) क्या होता है जब किसी मानव मादा के अण्डाशय से मुक्त अण्ड का निषेचन नहीं होता है ?

(ख) असुरक्षित यौन क्रिया के कारण एक जीवाणुजनित और एक वाइरस संक्रमित रोग का नाम लिखिए । *1+1*

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. Two elements, A and B belong to the 3rd period of Modern Periodic Table. Element A belongs to Group 1 whereas Element B belongs to Group 16. Compare the following characteristics of A and B, giving justification for each : 2

   (a) Atomic size

   (b) Metallic character

2. The atomic number of a non-metal 'X' is 8. 1+1

   (a) Write the period number and the group number of 'X'.

   (b) Draw the electron dot structure of its molecule.

3. 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

4. (a) What happens when in a human female the egg released by the ovary is not fertilised ?

   (b) Name one bacterial and one viral infection caused due to unsafe sex. 1+1

5. **(क)** **(i)** उस नियम का नाम और वह नियम लिखिए जो किसी एकसमान चुम्बकीय क्षेत्र में क्षेत्र के लम्बवत् किसी धारावाही सीधे चालक पर लगने वाले बल की दिशा निर्धारित करता है ।

(ii) कोई ऐल्फा कण किसी चुम्बकीय क्षेत्र में गुज़रते समय उत्तर दिशा में प्रक्षिप्त हो जाता है । यदि इसी चुम्बकीय क्षेत्र में कोई इलेक्ट्रॉन गुज़रता है, तो वह किस दिशा में प्रक्षिप्त होगा ? *2*

अथवा

(ख) **(i)** परिनालिका किसे कहते हैं ?

(ii) किसी परिनालिका जिससे कोई स्थायी धारा प्रवाहित हो रही है, के चुम्बकीय क्षेत्र की चुम्बकीय क्षेत्र रेखाओं का पैटर्न खींचिए । *2*

6. **(क)** ओज़ोन क्या है ? पृथ्वी के वायुमण्डल के उच्चतर स्तरों पर यह किस प्रकार निर्मित होती है ? ओज़ोन हमारे पारितंत्र को किस प्रकार प्रभावित करती है ? *2*

अथवा

(ख) **(i)** दो मानव-निर्मित पारितंत्रों की सूची बनाइए । *1*

(ii) "हम किसी तालाब की सफाई उस ढंग से नहीं करते हैं जिस ढंग से हम अपनी जलजीवशाला की सफाई करते हैं ।" इस कथन की कारण सहित पुष्टि कीजिए । *1*

7. **(क)** विभिन्नता किसे कहते हैं ? उन दो प्रमुख कारणों की सूची बनाइए जिनके कारण किसी समष्टि में विभिन्नता उत्पन्न होती है । *2*

अथवा

(ख) **(i)** बैंगनी पुष्पों वाले पौधों और श्वेत पुष्पों वाले पौधों के मध्य संकरण द्वारा उत्पन्न F_1 संतति के पौधों के लक्षणों का उल्लेख कीजिए ।

(ii) यदि F_1 संतति के पौधों का स्वपरागण कराया जाए, तो F_2 संतति के पौधों में क्या प्रेक्षण होंगे ?

(iii) यदि F_2 संतति में 100 पौधे प्राप्त होते हैं, तो उनमें से कितने पौधे अप्रभावी लक्षण दर्शाएँगे ? *2*

5. (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*

6. (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*

7. (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*

8. (क) उस संतृप्त हाइड्रोकार्बन, जिसके अणु में चार कार्बन परमाणु हैं, की संभावित दो विभिन्न संरचनाएँ खींचिए । समान आण्विक सूत्र के इस हाइड्रोकार्बन की दो संरचनाओं को क्या कहते हैं ? इस यौगिक का सामान्य नाम और आण्विक सूत्र लिखिए । इस यौगिक के ऐल्काइन का आण्विक सूत्र लिखिए ।   *3*

अथवा

(ख) (i) बेन्ज़ीन का आण्विक सूत्र लिखिए और इसकी संरचना खींचिए ।

(ii) बेन्ज़ीन के अणु में उपस्थित एकल सहसंयोजी आबन्धों और द्वि सहसंयोजी आबन्धों की संख्या लिखिए ।

(iii) किन यौगिकों को ऐल्काइन कहते हैं ?   *3*

9. (क) आधुनिक आवर्त सारणी में किसी तत्त्व की परमाणु संख्या को तत्त्वों के वर्गीकरण के आधार के रूप में अपनाने के दो लाभों की सूची बनाइए ।

(ख) तत्त्वों X (परमाणु संख्या 13) और Y (परमाणु संख्या 20) के इलेक्ट्रॉनिक विन्यास लिखिए ।   *3*

10. अनुमतांक 4 kW और 220 V के किसी विद्युत् तापक के लिए निम्नलिखित का परिकलन कीजिए :   *3*

(क) प्रवाहित धारा

(ख) 2 घण्टों में उपभुक्त ऊर्जा

(ग) यदि 1 kWh का मूल्य ₹ 4·50 है, तो उपभुक्त ऊर्जा का मूल्य

11. लाल नेत्रों की F_1 संतति प्राप्त करने के लिए किसी लाल नेत्र वाले व्यष्टि का किसी श्वेत नेत्र वाले व्यष्टियों से संकरण कराया गया है । जब F_1 संतति के व्यष्टियों में परस्पर संकरण हुआ, तो F_2 संतति में लाल नेत्र और श्वेत नेत्र दोनों के व्यष्टि बने ।

(क) प्रभावी लक्षण की पहचान किस प्रकार की जाती है ?

(ख) अप्रभावी लक्षण क्या होते हैं ?

(ग) यदि F_2 संतति में 12 जीव उत्पन्न होते हैं, तो उनमें से सफेद नेत्रों वाले कितने व्यष्टि प्राप्त होंगे ? लाल नेत्रों और श्वेत नेत्रों वाले व्यष्टियों का अनुपात परिकलित कीजिए । $1+\frac{1}{2}+\frac{1}{2}+1$

12. (क) जीवों के उस समूह का नाम लिखिए जिनसे सभी आहार शृंखलाओं का पहला पोषी स्तर बनता है । इन्हें यह नाम क्यों दिया गया है ?

(ख) मानव जैव-आवर्धन से सबसे अधिक दुष्प्रभावित क्यों होते हैं ?

(ग) किसी प्राकृतिक पारितंत्र से अपमार्जकों (अपघटकों) की अनुपस्थिति का एक दुष्परिणाम लिखिए ।   *3*

SECTION B

8. (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*

9. (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*

10. For a heater, rated 4 kW and 220 V, calculate the following :   *3*
   (a) The current
   (b) Energy consumed in 2 hours
   (c) If 1 kWh is priced at ₹ 4·50, then the cost of energy consumed

11. A red-eyed individual is crossed with a white-eyed individual to produce F_1 progeny with red eyes. When F_1 individuals are intercrossed, F_2 progeny is formed with both red as well as white-eyed individuals.

   (a) How is the dominant trait identified ?

   (b) What are recessive traits ?

   (c) If 12 individuals are produced in F_2 generation, then how many white-eyed individuals would be obtained ? Calculate the ratio of red-eyed individuals to white-eyed individuals. $1+\frac{1}{2}+\frac{1}{2}+1$

12. (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*

13. (क) (i) विद्युत् शक्ति की परिभाषा दीजिए और इसका SI मात्रक लिखिए । $\frac{1}{2} + \frac{1}{2}$

(ii) 100 W; 220 V और 60 W; 220 V अनुमतांक के दो बल्ब 220 V के किसी विद्युत् मेन्स से पार्श्व में संयोजित हैं । बल्बों द्वारा मेन्स से ली गई विद्युत धारा ज्ञात कीजिए । 2

अथवा

(ख) (i) जूल का तापन नियम लिखिए । इसे गणितीय रूप में उस परिस्थिति में व्यक्त कीजिए जिसमें प्रतिरोध R की कोई युक्ति किसी V वोल्टता के स्रोत से संयोजित है तथा उससे समय t के लिए धारा I प्रवाहित होती है ।

(ii) कोई प्रतिरोधक जिसका प्रतिरोध 5 Ω है, 6 वोल्ट की किसी बैटरी के सिरों से संयोजित है । 10 सेकण्ड में ऊष्मा के रूप में क्षयित ऊर्जा परिकलित कीजिए । 3

खण्ड ग

इस खण्ड में 2 प्रकरण-आधारित प्रश्न (14 और 15) हैं । प्रत्येक प्रकरण में 3 उप-भाग (क), (ख) और (ग) हैं । भाग (क) और (ख) अनिवार्य हैं । भाग (ग) में आंतरिक चयन प्रदान किया गया है ।

14. कोई छात्रा किसी चिपचिपे पदार्थ का उपयोग करके ड्राइंग बोर्ड पर एक सफेद कागज़ की शीट लगाती है । वह इसके बीचों-बीच एक छड़ चुम्बक रखती है तथा इस छड़ चुम्बक के चारों ओर, नमक-छितरावक का उपयोग करके, एकसमान रूप से कुछ लौह-चूर्ण छितराती है । बोर्ड को धीरे-धीरे थपथपाने पर वह यह प्रेक्षण करती है कि लौह-चूर्ण स्वयं ही एक विशेष पैटर्न में व्यवस्थित हो गया है ।

(क) लौह-चूर्ण के इस पैटर्न को दर्शाने के लिए आरेख खींचिए । 1

(ख) लौह-चूर्ण को एक निश्चित पैटर्न में कौन व्यवस्थित करता है ? 1

(ग) (i) किसी बिन्दु पर चुम्बकीय क्षेत्र की दिशा क्षेत्र रेखाओं का उपयोग करके किस प्रकार ज्ञात की जाती है ? दो चुम्बकीय क्षेत्र रेखाएँ एक-दूसरे का प्रतिच्छेदन क्यों नहीं करती हैं ? 2

अथवा

(ii) छोटी दिक्सूची का उपयोग करके किसी छड़ चुम्बक की चुम्बकीय क्षेत्र रेखाएँ कैसे खींची जाती हैं ? चुम्बक के दोनों ओर एक-एक चुम्बकीय क्षेत्र रेखा खींचिए । 2

---

13. (a) (i) Define Electric Power and write its SI unit. $\dfrac{1}{2}+\dfrac{1}{2}$

(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*

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. 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) What makes iron filings arrange in a definite pattern ? *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*

15. वह प्रक्रिया जिसके द्वारा किसी व्यष्टि का लिंग निर्धारित होता है, लिंग-निर्धारण कहते हैं । मानवों में किसी नवजात का लिंग-निर्धारण आनुवंशिक आधार पर किया जाता है, जबकि कुछ अन्य में ऐसा नहीं होता है । मानवों में 46 (23 जोड़े) गुणसूत्र होते हैं । इनमें से 44 (22 जोड़े) गुणसूत्र शारीरिक लक्षणों को नियंत्रित करते हैं तथा दो (एक जोड़ा) गुणसूत्र को लिंग गुणसूत्र कहते हैं । लिंग गुणसूत्र दो प्रकार के होते हैं — X गुणसूत्र और Y गुणसूत्र । निषेचन के समय नवजात शिशु का लिंग निर्धारण इस तथ्य पर निर्भर करता है कि नर युग्मक का कौन-सा प्रकार मादा युग्मक के साथ संलयन करता है ।

(क)   लड़का अथवा लड़की पैदा होने की सांख्यिकीय संभाव्यता क्या होती है ? अपने उत्तर की पुष्टि कीजिए । $\frac{1}{2} + \frac{1}{2}$

(ख)   नर और मादा में से किसमें लिंग गुणसूत्रों का जोड़ा परिपूर्ण होता है ? परिपूर्ण जोड़े की स्थिति में, क्या सभी उत्पन्न होने वाले युग्मक एक ही प्रकार के होंगे अथवा भिन्न प्रकार के होंगे ?   *1*

(ग)   (i)   उन दो जीवों के नाम लिखिए जिनका लिंग निर्धारण आनुवंशिक आधार पर नहीं होता । इनके लिंग निर्धारण की प्रक्रिया की व्याख्या कीजिए ।   *1+1*

अथवा

(ii)   केवल प्रवाह आरेख की सहायता से, यह दर्शाइए कि मानवों में आनुवंशिक रूप से लिंग निर्धारण किस प्रकार होता है ।   *1+1*

_____

15. 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)   What is the statistical probability of getting either a male or a female child ? Justify your answer. $\frac{1}{2} + \frac{1}{2}$

(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*

Class : X Secondary School Term II Examination, 2022
Marking Scheme – Science SUBJECT CODE -086
(PAPER CODE –31/1/3)

General Instructions: -

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.

2. **"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc may invite action under IPC."**

3. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**

4. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.

5. Evaluators will mark(√) wherever answer is correct. For wrong answer 'X" be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**

6. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.

7. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.

8. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.

9. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

10. A full scale of marks **40** has to be used. Please do not hesitate to award full marks if the answer deserves it.

11. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 30 answer books per day in main subjects and 35 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.

12. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
- Leaving answer or part thereof unassessed in an answer book.
- Giving more marks for an answer than assigned to it.
- Wrong totalling of marks awarded on a reply.
- Wrong transfer of marks from the inside pages of the answer book to the title page.
- Wrong question wise totalling on the title page.
- Wrong totalling of marks of the two columns on the title page.
- Wrong grand total.
- Marks in words and figures not tallying.
- Wrong transfer of marks from the answer book to online award list.
- Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
- Half or a part of answer marked correct and the rest as wrong, but no marks awarded.

13. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.

14. Any unassessed portion, non-carrying over of marks to the title page, or totalling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.

15. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

16. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totalled and written in figures and words.

17. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.
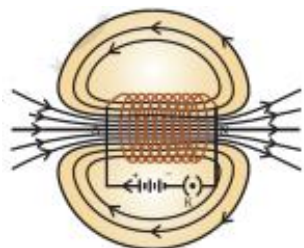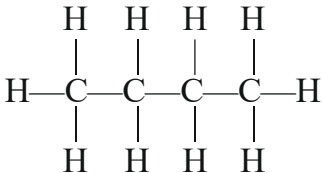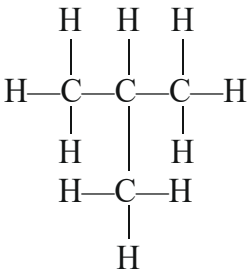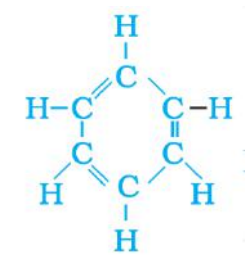
Instructions:
- **The marking scheme carries only suggested value points for the answers.**
- **These are only guidelines and do not constitute the complete answer.**
- **The students can have their own expression and if the expression is correct, the marks are awarded accordingly.**
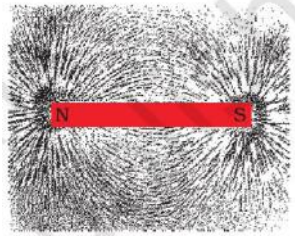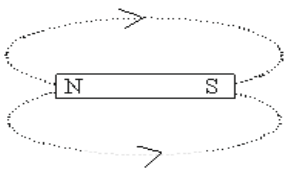
Maximum Marks : 40

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(a) • Atomic size of A is greater than atomic size of B	½	
	• Atomic size decreases in moving from left to right along a period due to increased effective nuclear charge.	½	
	(b) • Metallic character of A is more than metallic character of B.		
	• Because the tendency to lose electrons decreases from left to right along a period.	½	
		½	2
2.	(a) • Period number—2	½	
	• Group number—16	½	
	(b)	1	
			2
3.	• Planaria	½	
	• Regeneration is carried out by specialised cells which are not present in spirogyra.	1	
	• Hydra	½	
			2
4.	(a) If the egg is not fertilized, it lives for about one day and the uterine lining formed to receive the fertilized egg slowly breaks and comes out through the vagina as blood and mucous along with unfertilized egg.	1	
	(b) Bacterial infection: Gonorrhoea/Syphilis. Viral infection: Warts / AIDS.		
	(Any one in each case)	½+½	
			2
5.	(a) i) • Fleming's left-hand rule	½	

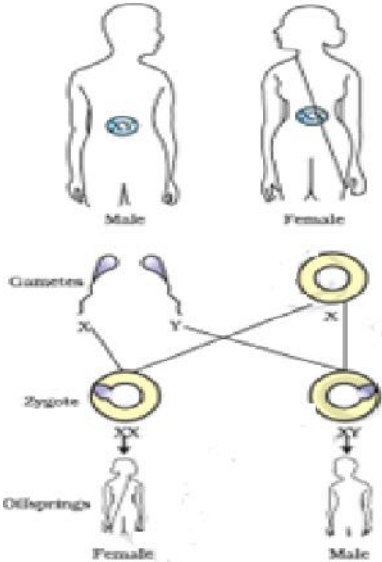|				
	• Stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.	1	
	ii) South	½	
	OR		
	b) i) A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder.	1	
	ii)	1	
			2
6.	a)		
	• Ozone is a molecule formed by three atoms of oxygen.	½	
	• UV radiations split some molecular oxygen (O_2) into free oxygen atoms (O + O). These atoms then combine with molecular oxygen to form ozone. /	1	
	$$O_2 \xrightarrow{UV} O + O$$ $$O + O_2 \rightarrow O_3 \text{ (Ozone)}$$		
	• Ozone layer shields the surface of the earth from damaging UV radiation of the sun. / Depletion of ozone layer causes harmful effects on the organism.	½	
	OR		
	b)		
	i) Aquarium, crop field, gardens, etc. (any two)	½+½	
	ii) A pond is a natural ecosystem. It has decomposers whereas an aquarium is an artificial ecosystem and does not contain decomposers. Therefore it needs regular cleaning for proper functioning.	1	2
7.	a) ● The differences in the traits shown by the individuals of a species.	1	
	● Two reasons :		
	i) Inaccurate / Error in DNA copying	½	
	ii) Sexual reproduction	½	
	OR		

	b)	½	
	(i) F1 Progeny : Violet flowered plants	1	
	(ii) F2 Progeny : Violet as well as white flowered plants	½	
	(iii) 25 plants		2

<table>
<tr><td colspan="4" align="center">SECTION— B</td></tr>
</table>

8. a) •

H—C—C—C—C—H (with H atoms above and below each carbon)

½

•

H—C—C—C—H structure with H—C—H branch below

½

- Isomers — ½
- C_4H_{10} — ½
- Butane — ½
- C_4H_6 — ½

8.   **OR**

b) i)

- C_6H_6 — ½

•

(benzene ring structure)

½

ii)

- Single bond 9
- Double bond 3 — ½

iii)   Hydrocarbons containing triple bond — ½

1

3

9. (a)

	• Atomic number is more fundamental property and it decides the properties of an element. • Atomic number increases by one in going from one element to the next, so arrangement of elements becomes more systematic. • Prediction of properties of elements could be made with more precision when the elements are arranged in increasing order of their atomic numbers. **(Any two)**	1+1		
	(b) Electronic configuration of X - 2, 8, 3 Electronic configuration of Y - 2, 8, 8, 2	½ + ½	3	
10.	Given : $P = 4$ kW = 4000 W $V = 220$ V (a) $\quad P = VI$ $\quad I = \dfrac{P}{V} = \dfrac{4000\text{ W}}{220\text{ V}} = 18 \cdot 18$ A (b) $\quad\quad E = P \times t$ $\quad\quad\quad = 4\text{ kW} \times 2\text{ h} = 8\text{ kWh}$ (c) Cost of 1 kW = ₹ 4·50 Then 8 kWh = 8 × 4·50 = ₹ 36·0	½ ½ ½ ½ 1	3	

11.	(a) The F1 progeny is only red eyed individuals. So, the red eye is the dominant trait.
	(b) The traits that cannot express themselves in the presence of a dominant trait.
	(c) ● 3 white eyed individuals.
	   ● red eyed : white eyed
	     3 : 1
		1
		1
		
		½ + ½
			3	

12.	(a) Producers, as they can manufacture food by the process of photosynthesis.
	(b) When non-degradable harmful chemicals (pesticides / DDT, etc.) enter a food chain, they get progressively accumulated at each trophic level. Human beings occupy the top level in any food chain, therefore the maximum concentration of these chemicals get accumulated in their bodies.
	(c) Ill effects of absence of decomposers from natural ecosystem :
	   (i) Earth would be covered with dead bodies & foul smell
	   (ii) Recycling of minerals will not take place
		½ + ½
		
		1		

	(iii) Soil will not get replenished			
	(iv) Ecosystem will get disrupted			
	(any other relevant point) (any one)	1		3

13. (a) (i)

The rate at which electric energy is dissipated or consumed in an electric circuit.   ½

S.I. unit—watt / V.A / joule per second   ½

(a) (ii) • Current drawn by first bulb

$$I_1 = \frac{100\ \text{W}}{220\ \text{V}} = \frac{100}{220}\ \text{ampere}$$ ½

• Current drawn by second bulb

$$I_2 = \frac{60\ \text{W}}{220\ \text{V}} = \frac{60}{220}\ \text{ampere}$$ ½

Both the bulbs are in parallel   ½

Total current, $I = I_1 + I_2$ ½

$$= \left(\frac{100}{220} + \frac{60}{220}\right)\text{ampere} = \frac{160}{220}\ \text{A} = 0\cdot73\ \text{A}$$

(Accept any other method)

OR

(b) i) This law states that heat produced in a resistor is—

• directly proportional to the square of current for a given resistance / $(H \propto I^2)$

• directly proportional to the resistance for a given current / $(H \propto R)$

• directly proportional to the time for which the current flows through the resistor / $(H \propto t)$ 1

• $H = V\,I\,t$ ½

ii)

$V = 6$ V; $R = 5\ \Omega$; $t = 10$ s

Energy dissipated as heat in $t = 10$ s is

$$H = \frac{V^2}{R}t$$ ½

$$= \frac{(6\ \text{V})^2}{5\ \Omega} \times 10\ \text{s}$$ ½

	= 72 J		½	
				3

<div align="center">SECTION—C</div>

14.	(a)		1
	(b)	In the field of bar magnet iron filings experience a force which is different at different points in terms of magnitude and direction. The iron filings, being free to move arrange themselves along the direction of force.	1
	(c) i)	• By placing a compass needle on magnetic field lines, direction of north pole will give direction of magnetic field.	1
		• If they cross or intersect , it means that at the point of intersection the compass needle would point into two directions, which is not possible. /	1
		If they cross or intersect, it means that at the point of intersection there will be direction of two resultant fields which is not possible.	
		OR	
	(c) ii)	• Take a small bar magnet, place it in the centre of the drawing sheet fixed on a drawing board and mark its boundary.	½
		• Place a small compass needle near the north pole of the magnet, south pole of the compass needle points towards the north pole.	
		• Mark the position of two ends of the needle. Now move the needle to a new position such that the south pole of needle occupies the position previously occupied by the north pole and again mark the new position of the north pole. In this way proceed step by step till you reach the south pole of the magnet. Join the points marked to get a field line. Similarly draw one more field line on the other side of the magnet.	½
			½

			½	
				4
15.	(a)	• 50% male , 50% female / 1 : 1 / Equal probability of male and female child.	½	
		• All children will inherit X chromosome from the mother but the one who inherits X chromosome from the father will be a girl and the one who inherits Y chromosome will be a boy.	½	
	(b)	• Mother/Female	½	
		• Same kind	½	
	(c)(i)	• Reptiles & Snails	½ + ½	
		• In reptiles, the temperature at which fertilised eggs are kept determines whether the animal developing in the eggs would be a male or a female.	½	
		In snails, they can change their sex during their life time.	½	
		OR		
	(c) (ii)			
		Diagram	1	
		Labelling	1	
				4

* **