Series : QQCRR/2

SET-3

प्रश्न–पत्र कोड
Q.P. Code **31/2/3**

रोल नं.
Roll No.

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 **12** 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 **12** 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 candidates 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***

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 है – खण्ड-**क**, **ख** एवं **ग** ।*

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

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

(v) *खण्ड – **ग** : प्रश्न संख्या **14** और **15** प्रकरण आधारित प्रश्न हैं । प्रत्येक प्रश्न **4** अंक 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. (i) दिए गए तत्त्व X, जिसका प्रतीक नीचे दिया गया है, का इलेक्ट्रॉन विन्यास लिखिए :

$^{40}_{20}X$.

(ii) आधुनिक आवर्त सारणी में इस तत्त्व की स्थिति लिखिए ।

(iii) इस तत्त्व के ऑक्साइड की क्या प्रकृति है ?

(iv) इस समूह के किसी एक अन्य तत्त्व का नाम लिखिए । ½ × 4

2. (i) चार कार्बन परमाणु वाले संतृप्त हाइड्रोकार्बन का नाम और उसकी संरचना खींचिए ।

(ii) इस यौगिक में एकल सहसंयोजी आबन्धों की संख्या लिखिए । **2**

3. (a) डबल रोटी की फफूँदी (राइजोपस) के जनन में भाग लेने वाले और जनन में भाग न लेने वाले भागों का नाम लिखिए ।

(b) कायिक प्रवर्धन के किन्हीं दो लाभों की सूची बनाइए । **2**

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 numbers **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. (i) Write the electronic configuration of element X, given by its symbol as under :

$^{40}_{20}X$.

(ii) Determine its position in the modern periodic table.

(iii) What is the nature of its oxide ?

(iv) Name one other element of its group. ½ × 4

2. (i) Write the name and draw the structure of a saturated hydrocarbon with four carbon atoms.

(ii) Write the number of single covalent bonds present in this compound. **2**

3. (a) Name the reproductive and non-reproductive parts of bread mould (Rhizopus).

(b) List any two advantages of vegetative propagation. **2**

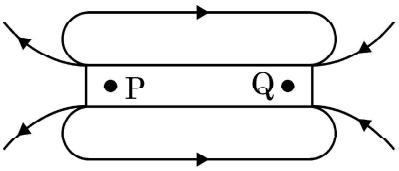
4. (a) निम्नलिखित में प्रत्येक में एक कमी का उल्लेख कीजिए : ½ × 4 = 2

(i) गर्भनिरोधी गोलियाँ

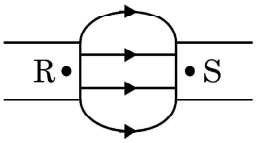
(ii) कॉपर-T

(b) गर्भनिरोधी विधियों में से कण्डोम के उपयोग को किस श्रेणी में रखा जाता है ? यह गर्भनिरोधक का उपयोग अन्य विधियों की तुलना में किस प्रकार से बेहतर है ?

5. (a) नीचे दिए गए आरेखों 'a' और 'b' में चुम्बकों के ध्रुवों P, Q, R और S के नाम लिखिए : ½+½+1=2



आरेख 'a'



आरेख 'b'

(b) इन आरेखों के आधार पर चुम्बकीय क्षेत्र रेखाओं की दिशाओं के बारे में निकलने वाला निष्कर्ष लिखिए ।

अथवा

एकसमान चुम्बकीय क्षेत्र में स्थित किसी सीधे धारावाही चालक पर लगने वाला बल (i) कब अधिकतम; और (ii) कब निम्नतम होता है ? 1 + 1 = 2

6. नीचे दी गयी आहार शृंखला में मोर को मात्र 2 जूल ऊर्जा ही उपलब्ध थी । घास में कितनी ऊर्जा उपस्थित रही होगी ? अपने उत्तर की पुष्टि कीजिए । 2

घास → टिड्डा → मेंढक → सर्प → मोर

अथवा

(a) कूड़ा-कर्कट से क्या तात्पर्य है ? उन दो वर्गों की सूची बनाइए जिनमें इसे वर्गीकृत किया जाता है ।

(b) उस समय हमारा यह कहने का वास्तविक अर्थ क्या होता है कि "एन्ज़ाइम अपनी क्रिया में विशिष्ट होते हैं ।"

4. (a) State one drawback of each of the following : ½ × 4 = 2

(i) Oral contraceptive pills

(ii) Copper-T

(b) Under which category of contraceptive methods, is the use of condom kept ? In what way, its use is better as compared to other methods of contraception ?

5. (a) Name the poles P, Q, R and S of the magnets in the following figures 'a' and 'b' : ½+½+1=2

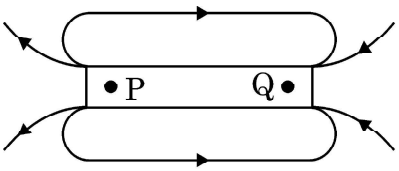


Figure 'a'

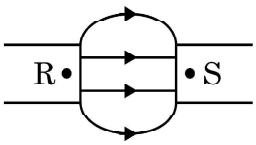


Figure 'b'

(b) State the inference drawn about the direction of the magnetic field lines on the basis of these diagrams.

OR

When is the force experienced by a current – carrying straight conductor placed in a uniform magnetic field. 1 + 1 = 2

(i) Maximum ;

(ii) Minimum ?

6. In the following food chain, only 2J of energy was available to the peacocks. How much energy would have been present in Grass ? Justify your answer. 2

GRASS → GRASS HOPPER → FROG → SNAKE → PEACOCK

OR

(a) What is meant by garbage ? List two classes into which garbage is classified.

(b) What do we actually mean when we say that the "enzymes are specific in their action" ?

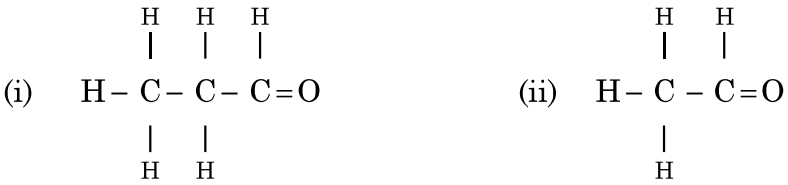
7. किसी आवृतबीजी के जननांगों के नाम लिखिए । यह भाग कहाँ स्थित होते हैं ? इसके नर जननांग की संरचना की व्याख्या कीजिए । **2**

अथवा

यौवनावस्था किसे कहते हैं ? किशोरावस्था के आरम्भिक वर्षों में लड़कों व लड़कियाँ दोनों में होने वाले किन्हीं दो सामान्य परिवर्तनों का उल्लेख कीजिए ।

खण्ड – ख

8. नीचे दिए गए कार्बनिक यौगिकों पर विचार कीजिए : **3**



(i) (ii)

(a) इन यौगिकों में उपस्थित प्रकार्यात्मक समूह का नाम लिखिए ।

(b) इस प्रकार्यात्मक समूह के यौगिकों के लिए सामान्य सूत्र लिखिए ।

(c) इन यौगिकों के बीच संबंध लिखिए और इसी प्रकार्यात्मक समूह के किसी अन्य यौगिक की संरचना खींचिए ।

अथवा

(a) एथाइन की इलेक्ट्रॉन बिन्दु संरचना खींचिए । **1+2 = 3**

(b) सहसंयोजी यौगिकों और आयनी यौगिकों के बीच दो अन्तरों की सूची बनाइए ।

9. (a) न्यूलैन्ड्स का अष्टक नियम लिखिए । **1+1+½+½ = 3**

(b) किसी उदाहरण द्वारा डॉबेराइनर के त्रिक की व्याख्या कीजिए ।

(c) 'a' और 'b' में किए गए प्रयासों में प्रत्येक की एक-एक सीमा की सूची बनाइए ।

10. (a) विद्युत धारा का तापन प्रभाव क्या है ? **3**

(b) किसी युक्ति से विद्युत धारा प्रवाहित करने पर प्रतिरोधक में उत्पन्न ऊष्मा की मात्रा के लिए कोई व्यंजक लिखिए । व्यंजक में उपयोग किए प्रतीकों का अर्थ लिखिए ।

(c) विद्युत धारा के तापन प्रभाव पर आधारित दो युक्तियों के नाम लिखिए ।

11. गुणसूत्र क्या हैं ? व्याख्या कीजिए कि लैंगिक जनन करने वाले जीवों में स्पीशीज़ के DNA का स्थायित्व किस प्रकार सुनिश्चित किया जाता है ? **3**

7. Name the reproductive parts of an angiosperm. Where are these parts located ? Explain the structure of its male reproductive part. **2**

OR

What is puberty ? Mention any two changes that are common to both boys and girls in early teenage years.

SECTION – B

8. Consider the following organic compounds : **3**

(i) (ii)

(a) Name the functional group present in their compounds.

(b) Write the general formula for the compounds of this functional group.

(c) State the relationship between these compounds and draw the structure of any other compound having similar functional group.

OR

(a) Draw the electron dot structure for ethyne. **1+2 = 3**

(b) List two differences between the properties exhibited by covalent compounds and ionic compounds.

9. (a) State Newland Law of Octaves. **1+1+½+½ = 3**

(b) With an example, explain Dobereiner's Triads.

(c) List one limitation each of both the attempts mentioned in 'a' & 'b'.

10. (a) What is the heating effect of electric current ? **3**

(b) Write an expression for the amount of heat produced in a resistor when an electric current is passed through it stating the meanings of the symbols used.

(c) Name two appliances based on heating effect of electric current.

11. What are Chromosomes ? Explain how stability of the DNA of the species is ensured in sexually reproducing organisms. **3**

12. (a) हम तालाबों और झीलों की सफाई नहीं करते, परन्तु जलजीवशाला को नियमित सफाई की आवश्यकता होती है । क्यों ? **1+2**

(b) वायुमण्डल के उच्चतर स्तरों पर ओज़ोन की परत की क्षति क्यों हो रही है ? इस क्षति के एक दुष्प्रभाव का उल्लेख कीजिए ।

13. (a) उन कारकों की सूची बनाइए जिन पर किसी दिये गए पदार्थ के एकसमान बेलनाकार चालक का प्रतिरोध निर्भर करता है । **2+1**

(b) त्रिज्या 0.01 cm के किसी तार का प्रतिरोध 10 Ω है । यदि इस तार की प्रतिरोधकता 50×10^{-8} Ω m है, तो तार की लम्बाई ज्ञात कीजिए ।

अथवा

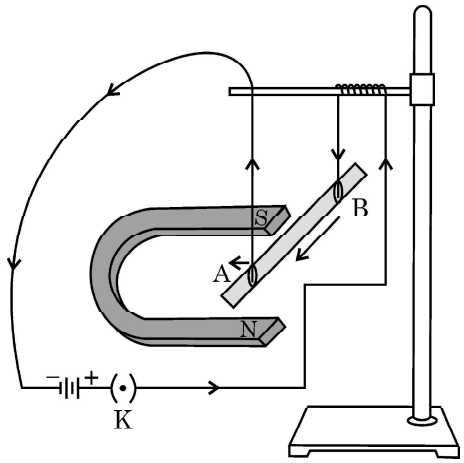
(a) किसी वैद्युत युक्ति की विद्युत शक्ति से क्या तात्पर्य है ? इसका SI मात्रक लिखिए । **1½**

(b) 2kW की किसी विद्युत केतली का उपयोग 2 घण्टे तक किया गया है । उपभुक्त ऊर्जा का (i) किलोवाट घण्टा, और (ii) जूल में परिकलन कीजिए । **1½**

खण्ड – ग

इस खण्ड में 02 प्रकरण आधारित प्रश्न (14 और 15) हैं ।
प्रत्येक प्रकरण के पश्चात् **03** उपप्रश्न (a, b और c) दिए गए हैं ।
भाग (a) और (b) अनिवार्य हैं, परन्तु भाग (c) में आंतरिक चयन प्रदान किया गया है ।

14. किसी छात्र से, चुम्बकीय क्षेत्र में स्थित किसी धारावाही चालक पर लगने वाले बल का अध्ययन करने के लिए, प्रयोग करने के लिए कहा गया । उसने एक छोटी एलुमिनियम की छड़ AB, एक प्रबल नाल चुम्बक, कुछ संयोजक तार, एक बैटरी और एक कुण्डली लेकर उन्हें आरेख में दर्शाए अनुसार संयोजित किया । उसने यह प्रेक्षण किया कि विद्युत धारा प्रवाहित करने पर छड़ विस्थापित होती है तथा धारा की दिशा उत्क्रमित करने पर विस्थापन की दिशा भी उत्क्रमित हो जाती है । अपनी इस परिघटना की समझ के आधार पर नीचे दिए गए प्रश्नों के उत्तर दीजिए : **4**



12. (a) We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Why ? **1+2**

(b) Why is ozone layer getting depleted at the higher levels of the atmosphere ? Mention one harmful effect caused by its depletion.

13. (a) List the factors on which the resistance of a uniform cylindrical conductor of a given material depends. **2+1**

(b) The resistance of a wire of 0.01 cm radius is 10 Ω. If the resistivity of the wire is 50×10^{-8} Ω m, find the length of this wire.

OR

(a) What is the meaning of electric power of an electrical device ? Write its SI unit. **1½**

(b) An electric kettle of 2kW is used for 2h. Calculate the energy consumed in

(i) kilowatt hour and

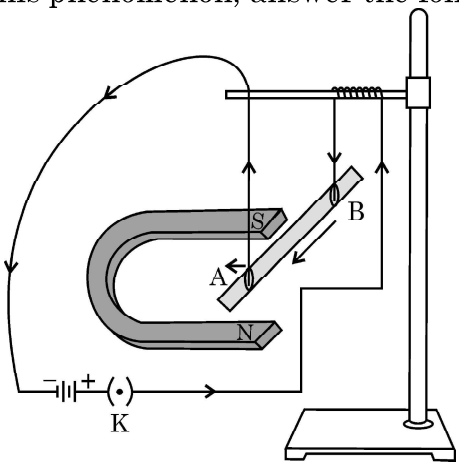
(ii) joules. **1½**

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. A student was asked to perform an experiment to study the force on a current carrying conductor in a magnetic field. He took a small aluminum rod AB, a strong horse shoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod gets displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions : **4**



(a) उस परिस्थिति का उल्लेख कीजिए जिसमें छड़ में प्रवाहित विद्युत धारा के समान परिमाण के लिए उसमें विस्थापन अधिकतम होता है ।

(b) चालक AB पर लगने वाले बल की दिशा निर्धारित करने वाला नियम लिखिए ।

(c) (i) यदि U आकृति के चुम्बक को ऊर्ध्वाधरत: रखें तथा एलुमिनियम की छड़ को क्षैतिजत: इस प्रकार निलंबित करें कि इसका सिरा B ठीक उत्तर की ओर हो तो छड़ में B से A की ओर धारा प्रवाहित करने पर छड़ किस दिशा में विस्थापित होगी ?

(ii) ऐसी किन्हीं दो युक्तियों का नाम लिखिए जिनमें धारावाही चालक और चुम्बकीय क्षेत्र का उपयोग किया जाता है ?

अथवा

किसी क्षैतिज कार्डबोर्ड पर ऊर्ध्वाधरत: स्थित किसी धारावाही सीधे चालक द्वारा उसके चारों ओर उत्पन्न चुम्बकीय क्षेत्र रेखाओं का पैटर्न खींचिए । चालक से प्रवाहित धारा और चुम्बकीय क्षेत्र रेखाओं की दिशा दर्शाइए ।

15. मेंडल ने अपने विज्ञान और गणितीय ज्ञान का समिश्रण करके उसका उपयोग प्रत्येक पीढ़ी के एक-एक जीव द्वारा प्रदर्शित विशेष लक्षणों का रिकार्ड रखने और गणना करने में किया । उन्होंने खेत में मटर के पौधों में कई स्थूल रूप से दिखाई देने वाले विपर्यासी (विकल्पी) लक्षणों का प्रेक्षण किया । उन्होंने बहुत से नियंत्रित प्रयोग किए जिनसे उन्हें वंशागत नियमों तक पहुँचने में सहायता मिली ।

(a) गोल बीज वाले लम्बे पौधों और झुर्रीदार बीज वाले बौने पौधों के संकरण से प्राप्त F1 संतति कैसी दिखाई देती है ?

(b) अप्रभावी लक्षण क्या होते हैं ?

(c) यदि F1 संतति के पौधों में स्वपरागण होता है तो F2 संतति में प्राप्त पौधों में नए संयोजनों के प्रकार और उनके अनुपात का उल्लेख कीजिए । **1+1+2 = 4**

अथवा

यदि F2 संतति में 1600 पौधे प्राप्त हुए, तो :

(i) गोल बीज वाले लम्बे पौधों, तथा

(ii) झुर्रीदार बीज वाले बौने पौधों की संख्या लिखिए ।

उपरोक्त प्रयोग का निष्कर्ष लिखिए ।

(a) State the condition under which the displacement of the rod is largest for the same magnitude of current flowing through it.

(b) State the rule that determines the direction of the force on the conductor AB.

(c) (i) If the U shaped magnet is held vertically and the aluminum rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will the rod be displaced ?

(ii) Name any two devices that use current carrying conductors and magnetic field.

OR

Draw the pattern of magnetic field lines produced around a current carrying straight conductor held vertically on a horizontal cardboard. Indicate the direction of the field lines as well as the direction of current flowing through the conductor.

15. Mendel blended his knowledge of Science and mathematics to keep the count of the individuals exhibiting a particular trait in each generation. He observed a number of contrasting visible characters controlled in pea plants in a field. He conducted many experiments to arrive at the laws of inheritance.

(a) What do the F1 progeny of tall plants with round seeds and short plants with wrinkled seeds look like ?

(b) What are recessive traits ?

(c) Mention the type of the new combinations of plants obtained in F2 progeny along with their ratio, if F1 progeny was allowed to self pollinate. **1+1+2 = 4**

OR

If 1600 plants were obtained in F2 progeny, write the number of plants having traits :

(i) Tall with round seeds

(ii) Short with wrinkled seeds

Write the conclusion of the above experiment.

*

Strictly Confidential: (For Internal and Restricted use only)
Class : X Secondary School Term II Examination, 2022
Marking Scheme – Science SUBJECT CODE - 086
[Paper Code : 31/2/3]

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.

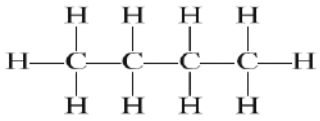
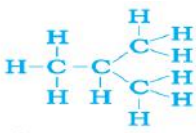
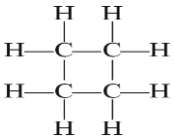
17. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

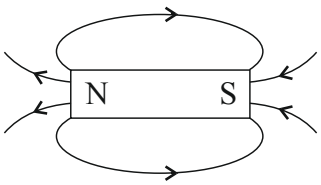
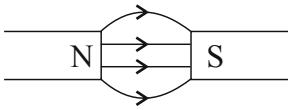
MARKING SCHEME
SECONDARY SCHOOL EXAMINATION TERM–II, 2022
SUBJECT : SCIENCE CODE 086
[PAPER CODE : 31/2/3]

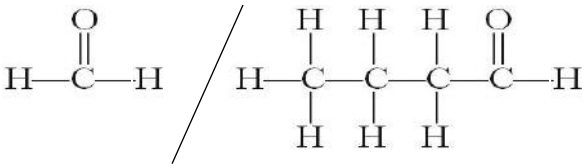
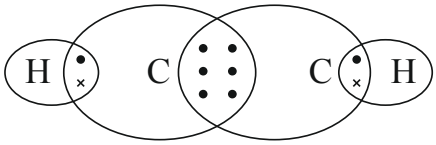
Instructions:-

- **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.**

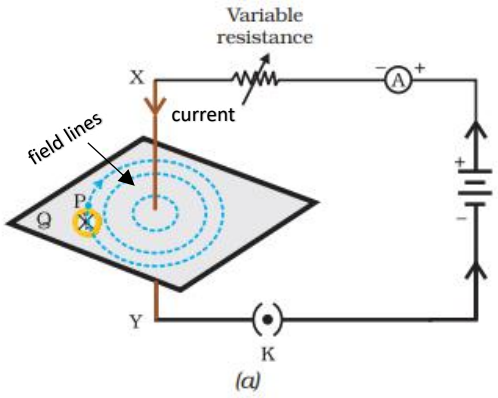
Maximum Marks : 40

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(i) X – 2, 8, 8, 2 (ii) Group - 2; Period - 4 (iii) Basic (iv) Beryllium/Magnesium/Strontium/Barium	½ ½ ½ ½	2
2.	(i) Butane :  Isobutane  Cyclobutane  (ii) No. of bonds 13 / No. of bonds 13 / No. of bonds 12	½ ½ 1	2
3.	(a) Reproductive part of bread mould—Sporangia / Spores Non-reproductive part of bread mould—Hyphae (b) (i) Plants raised by vegetative propagation can bear flowers and fruits much earlier than those produced from seeds. (ii) It is important for plants that have lost the capacity to produce seeds. (iii) All plants formed by this method are genetically similar to the parent plant and have all its characteristics. **(Or any other) (Any *two* points)**	½ ½ ½ +½	2
4.	(a) (i) change hormonal balance leading to side effects/cause hormonal imbalance (ii) Irritation in the uterus (b) ● mechanical barrier ● Prevents transmission of infections like STD's	½ ½ ½ ½	2

5.	(a)  ***a*** or P – North pole ; Q – South pole  ***b*** or R – North pole ; S – South pole (b) The magnetic field lines emerge from the North-pole and merge to South-pole outside the magnet. (Inside the magnet the direction is from South pole to North pole.) **Alternative answer** :- Closed curves which emerge from North pole and merge at the South pole. **OR** i. Maximum - when the direction of current (current carrying conductor) is perpendicular to the direction of magnetic field. ii. Minimum - (zero) when the direction of current (current carrying conductor) is parallel / antiparallel / along the direction of magnetic field.	½ ½ 1 1 1	2
6.	• 20,000 J • Only 10% usable energy / amount of organic matter is transferred from one trophic level to the next higher trophic level in a food chain and rest 90% is lost to the environment as heat. **OR** (a) • Waste material generated in day-to-day lives. • Biodegradable and Non-biodegradable substances. (b) Specific enzymes are needed for the breakdown of a particular / specific substance.	1 1 ½ ½ 1	2
7.	• Stamen • Pistil / Carpel • Located in the flower • The male reproductive part consists of <u>anther and filament</u> . (give full credit to labelled diagram of stamen) **OR** • The stage at which rate of general body growth begins to slow down and the reproductive tissues begin to mature. Two common changes 1) Thick hair growing in armpits and genital area. 2) Skin becomes oily. 3) Thin hair on legs and arms. **(or any other)** **(any two)**	½ ½ ½ ½ 1 ½+½	2

	SECTION—B		
8.	(a) Aldehyde	1	
	(b) $C_nH_{2n+1}CHO$ / $R-CHO$	1	
	(c) They are homologues.	½	
	 **(or any other)**	½	
	OR		
8.	(a) 	1	
	(b) **Covalent Compounds** / **Ionic Compounds** * low melting point / high melting point * low boiling point. / high boiling point. * poor conductors of electricity. / good conductors of electricity in molten state or aqueous solution. **(or any other difference)**	1+1	
	(Any Two)		3
9.	(a) "When the elements are arranged in the order of their increasing atomic masses, then every eighth element has properties similar to the first element."	1	
	(b) When the elements of a triad are arranged in the order of their increasing atomic masses, the atomic mass of the middle element is equal to the average of the atomic masses of other two elements.	½	
	Examples: • Li Na K • Ca Sr Ba • Cl Br I **(Any one example)**	½	
	(c) Limitations of :-		
	• Newlands' Law : Applicable till Calcium / assumed that only 56 elements existed / unlike elements placed in the same column (Co, Ni).	½	
	• Dobereiner's Triads : Only three triads were formed.	½	
			3

10.	(a) When an electric current is passed through a conductor, it becomes hot because the source energy is dissipated in the form of heat. This phenomenon is known as heating effect of electric current. (b) $H = I^2Rt$ or VIt or $\frac{V^2}{R}t$ H = Amount of heat produced R = Resistance I = Current t = Time V = Potential Difference (half marks for writing meaning of symbol) (c) Electric iron, geyser, heater **(any other)**	1 ½ ½ ½+½	3
11.	• Thread-like structures present in the nucleus carrying genetic material. • Each cell will have two copies of each chromosome, one each from the male and female parents. Every germ cell will take one chromosome from each pair. • When two germ cells combine, they restore the number of chromosomes, ensuring the stability of the species.	1 1 1	3
12.	(a) ▪ A pond is a natural ecosystem having its own cleaning system in the form of decomposers whereas an aquarium is a man-made or artificial ecosystem having no decomposers. (b) ▪ It is due to release of chlorofluorocarbons (CFCs) in the atmosphere. ▪ The harmful UV radiations would reach earth and cause damage to different life forms on the earth / cause skin cancer in human beings.	1 1 1	3
13.	(a) (i) Length of the conductor (l) (ii) Area of cross-section of the conductor (A) (b) Radius of wire, $r = 0 \cdot 01$ cm $= 0 \cdot 01 \times 10^{-2}$ m Resistance, $R = 10\ \Omega$ Resistivity, $\rho = 50 \times 10^{-8}\ \Omega$m $R = \rho\frac{l}{A} = \rho\frac{l}{\pi r^2} \Rightarrow l = \frac{R\pi r^2}{\rho}$ $l = \frac{10\Omega \times 22 \times (0{\cdot}01 \times 10^{-2})^2 \text{m}}{7 \times 50 \times 10^{-8}\Omega\text{m}}$ $= \frac{22}{35}\text{m} = 0 \cdot 629$ m $= 0.628$ m $= 0.62$ m	1 1 ½ ½	

	OR		
13.	(a) Rate at which electric energy is dissipated / consumed in an electric circuit SI unit : watt / joule per second / volt . ampere	1 ½	
	(b) $E = P \times t$	½	
	(i) 2 kW × 2h = 4kWh	½	
	(ii) 4 × 3.6 × 10^6 joules = 14.4 × 10^6 J / 1.44 × 10^7 J	½	3
	SECTION—C		
14.	(a) Direction of current in the rod is perpendicular to the direction of magnetic field.	1	
	(b) Fleming's left-hand rule : Stretch the thumb, forefinger and middle finger of your left-hand such that they are mutually perpendicular. If the first finger points to 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	
	(c) (i) Towards left or towards west / Into U shape magnet	1	
	(ii) Electric motor/ electric generator/ loudspeakers/ microphones/ electrical measuring instruments **(any two)**	½ + ½	
	OR		
	(c)  	1	
	Direction of current - downward	½	
	Direction of field lines – clockwise	½	
	Alternatively, if the direction of current is marked upwards then direction of field lines will be anticlockwise.		
	(Credit full marks if direction of current and field lines are marked in the diagram)		4
15.	(a) Tall with round seeds	1	
	(b) Short with wrinkled seeds / Recessive traits are those traits which are not expressed in the presence of dominant trait.	1	
	(c) Tall with wrinkled seeds : Short with round seeds	1	

	3 : 3 1 : 1 **OR**	1	
	(c) • i) 900 ii) 100 • When two individuals showing two different contrasting characteristics are bred with each other, then in F2 progeny new combinations are seen / visible as traits are independently inherited.	½ ½ 1	4

* * *