SET-1

Series JMS/3

कोड नं.
Code No. **31/3/1**

रोल नं.
Roll No.

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

Candidates must write the 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 कोड नम्बर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें ।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में **27** प्रश्न हैं ।
- **कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, 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.
- Code number 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 **27** questions.
- **Please write down the Serial Number of the question 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 : 3 घण्टे *अधिकतम अंक : 80*

Time allowed : 3 hours *Maximum Marks : 80*

सामान्य निर्देश :

(i) *इस प्रश्न-पत्र को* ***पाँच*** *भागों, अ, ब, स, द और य में बाँटा गया है । आपको* ***सभी*** *भागों के प्रश्नों के उत्तर लिखने हैं ।*

(ii) ***सभी*** *प्रश्न अनिवार्य हैं ।*

(iii) *भाग ब, स, द और य के प्रश्नों में आंतरिक चयन दिया गया है ।*

(iv) *भाग अ के प्रश्न संख्या* ***1*** *और* ***2*** *एक-एक अंक के प्रश्न हैं । इनके उत्तर एक शब्द अथवा एक वाक्य में देने हैं ।*

(v) *भाग ब के प्रश्न संख्या* ***3*** *से* ***5*** *दो-दो अंकों के प्रश्न हैं । इनके उत्तर लगभग 30 शब्दों प्रत्येक में देने हैं ।*

(vi) *भाग स के प्रश्न संख्या* ***6*** *से* ***15*** *तीन-तीन अंकों के प्रश्न हैं । इनके उत्तर लगभग 50 शब्दों प्रत्येक में देने हैं ।*

(vii) *भाग द के प्रश्न संख्या* ***16*** *से* ***21*** *पाँच-पाँच अंकों के प्रश्न हैं । इनके उत्तर लगभग 70 शब्दों प्रत्येक में देने हैं ।*

(viii) *भाग य के प्रश्न संख्या* ***22*** *से* ***27*** *प्रयोगात्मक कौशल पर आधारित दो-दो अंकों के प्रश्न हैं । इनके संक्षिप्त उत्तर देने हैं ।*

General Instructions :

(i) *The question paper comprises* ***five*** *Sections, A, B, C, D and E. You are to attempt* ***All*** *the sections.*

(ii) ***All*** *questions are compulsory.*

(iii) *Internal choice is given in Sections B, C, D and E.*

(iv) *Questions number* ***1*** *and* ***2*** *in Section A are one-mark questions. They are to be answered in one word or in one sentence.*

(v) *Questions number* ***3*** *to* ***5*** *in Section B are two-marks questions. These are to be answered in about 30 words each.*

(vi) *Questions number* ***6*** *to* ***15*** *in Section C are three-marks questions. These are to be answered in about 50 words each.*

(vii) *Questions number* ***16*** *to* ***21*** *in Section D are five-marks questions. These are to be answered in about 70 words each.*

(viii) *Questions number* ***22*** *to* ***27*** *in Section E are based on practical skills. Each question is a two-marks question. These are to be answered in brief.*

भाग अ
SECTION A

1. किसी पदार्थ की वैद्युत प्रतिरोधकता की परिभाषा लिखिए । *1*
Define the term electrical resistivity of a material.

2. किसी पारितंत्र के दो प्रमुख घटकों की सूची बनाइए । *1*
List two main components of an ecosystem.

भाग ब
SECTION B

3. आयनी यौगिक क्या होते हैं ? आयनी यौगिक ठोस अवस्था में विद्युत् चालन क्यों नहीं करते ? *2*
What are ionic compounds ? Why do ionic compounds not conduct electricity in the solid state ?

4. सहारे के चारों ओर किसी प्रतान की वृद्धि में ऑक्सिन किस प्रकार सहायक होते हैं ? *2*

अथवा

तंत्रिका आवेग किसे कहते हैं ? किसी जीव के शरीर में गमन करते समय किसी तंत्रिका आवेग की दिशा का उल्लेख कीजिए । *2*
How do auxins promote the growth of a tendril around a support ?

OR

What is a nerve impulse ? State the direction followed by a nerve impulse while travelling in the body of an organism.

5. स्वच्छ आकाश का वर्ण नीला क्यों होता है ? *2*
Why is the colour of the clear sky blue ?

भाग स
SECTION C

6. $H^+(aq)$ आयनों की सांद्रता के विलयन की प्रकृति पर प्रभाव का उल्लेख कीजिए । क्या क्षारीय विलयनों में भी $H^+(aq)$ आयन होते हैं ? यदि ऐसा है, तो फिर ये क्षारीय क्यों होते हैं ? *3*
State the effect of concentration of $H^+(aq)$ ions on the nature of the solution. Do basic solutions also have $H^+(aq)$ ions ? If yes, then why are these basic ?

7. तीन धातुओं P, Q और R में, P की सक्रियता Q से कम है तथा R की सक्रियता P और Q दोनों से अधिक है । कोई ऐसा क्रियाकलाप सुझाइए जिसके द्वारा P, Q और R को इनकी घटती हुई सक्रियता के क्रम में व्यवस्थित किया जा सकता है । *3*

अथवा

मर्करी के अयस्क का नाम लिखिए । संतुलित रासायनिक समीकरणों की सहायता से मर्करी को उसके अयस्क से निष्कर्षित करने की प्रक्रिया की व्याख्या कीजिए । *3*

Out of three metals P, Q and R, P is less reactive than Q and R is more reactive than P and Q both. Suggest an activity to arrange P, Q and R in order of their decreasing reactivity.

OR

Name the ore of mercury. With the help of balanced chemical equations, explain the process of extraction of mercury from its ore.

8. "किसी रसायनशास्त्री के लिए किसी तत्त्व का परमाणु क्रमांक उस तत्त्व के परमाणु द्रव्यमान की तुलना में अधिक उपयुक्त प्राचल माना जाता है ।" तत्त्व X (परमाणु क्रमांक 13) का उदाहरण लेकर इस कथन की पुष्टि कीजिए । *3*

"Atomic number of an element is considered to be a more appropriate parameter than its atomic mass for a chemist." Take the example of the element X (atomic number 13) to justify this statement.

9. मानव हृदय के चार कार्यों की सूची बनाइए । मानव शरीर में दोहरा परिसंचरण क्यों आवश्यक है ? *3*

List four functions of the human heart. Why is double circulation necessary in the human body ?

10. ऑक्सीजन की अनुपस्थिति अथवा कमी में ग्लूकोज़ के विखण्डन के पथों की व्याख्या कीजिए । *3*

Explain the ways in which glucose is broken down in absence or shortage of oxygen.

11. तालिका के रूप में प्रमस्तिष्क और अनुमस्तिष्क के बीच तीन विभेदनकारी लक्षणों की सूची बनाइए । *3*

List in tabular form three distinguishing features between cerebrum and cerebellum.

12. निम्नलिखित की व्याख्या कीजिए : *3*

(a) जाति-उद्भवन

(b) प्राकृतिक चयन

अथवा

मेंडल ने मटर के पौधों के साथ किए गए प्रयोगों में से एक प्रयोग में गोल बीज वाले और झुर्रीदार बीज वाले मटर के पौधों की विभिन्न किस्मों का संकरण कराया । इस संकरण द्वारा F_1 और F_2 पीढ़ी में प्राप्त पौधों के मेण्डल के प्रेक्षणों का कारण सहित उल्लेख कीजिए । गोल बीज के अतिरिक्त मेण्डल द्वारा अपने प्रयोग में उपयोग किए गए किन्हीं दो विपर्यासी (विकल्पी) लक्षणों वाले मटर के पौधों की सूची भी बनाइए । *3*

Explain the following :

(a) Speciation

(b) Natural Selection

OR

Mendel, in one of his experiments with pea plants, crossed a variety of pea plant having round seeds with one having wrinkled seeds. State Mendel's observations giving reasons of F_1 and F_2 progeny of this cross. Also, list any two contrasting characters, other than round seeds of pea plants that Mendel used in his experiments.

13. पर्यावरणीय अपवर्तन किसे कहते हैं ? नामांकित आरेख की सहायता से व्याख्या कीजिए कि आकाश में दिखाई देने वाले किसी तारे की स्थिति उसकी वास्तविक स्थिति नहीं होती है । *3*

अथवा

कक्षा में बैठे किसी छात्र को यह हम कब कहते हैं कि वह निकट-दृष्टि दोष से पीड़ित है ? इस दोष के दो कारणों की सूची बनाइए । किरण आरेख का उपयोग करके नेत्र के इस दोष के संशोधन के उपाय की व्याख्या कीजिए । *3*

What is atmospheric refraction ? Explain with the help of a labelled diagram that the position of a star as seen by us is not its true position.

OR

When do we consider a student sitting in the class to be myopic ? List two causes of this defect. Explain using a ray diagram how this defect of eye can be corrected.

14. उन दो ऊर्जा स्रोतों की सूची बनाइए जिन्हें आप नवीकरणीय मानते हैं । अपने चयनों की पुष्टि कीजिए । क्या ये ऊर्जा स्रोत प्रदूषण मुक्त हो सकते हैं ? अपने उत्तर की पुष्टि के लिए दो कारणों की सूची बनाइए । *3*

Name two energy sources that you would consider to be renewable. Give justification for your choices. Can these energy sources be pollution free ? List two reasons in support of your answer.

15. वनों को "जैव विविधता का विशिष्ट स्थल" क्यों माना जाता है ? वनों के संरक्षण के लिए चार उपाय सुझाइए । *3*

Why are forests considered "biodiversity hot spots" ? Suggest four approaches towards the conservation of forests.

भाग द
SECTION D

16. (a) द्विविस्थापन अभिक्रिया किसे कहते हैं ? किसी उदाहरण सहित व्याख्या कीजिए ।

(b) किसी बीकर में कुछ जल लेकर उसमें बिना बुझे चूने की कुछ मात्रा मिलाई गयी है ।

(i) होने वाली अभिक्रिया का नाम और उसकी परिभाषा लिखिए ।

(ii) उपर्युक्त अभिक्रिया का संतुलित रासायनिक समीकरण और बनने वाले उत्पाद का रासायनिक नाम लिखिए ।

(iii) इस अभिक्रिया के दो प्रमुख प्रेक्षणों की सूची बनाइए । *5*

अथवा

(a) लेड नाइट्रेट की अपघटन (वियोजन) अभिक्रिया को निदर्शित करने के लिए किसी क्रियाकलाप की अभिकल्पना कीजिए ।

(b) प्रायोगिक व्यवस्था का नामांकित आरेख खींचकर दो प्रमुख प्रेक्षणों की सूची बनाइए ।

(c) अभिकर्मक और उत्पादों की भौतिक अवस्था का उल्लेख करते हुए होने वाली अभिक्रिया का संतुलित रासायनिक समीकरण लिखिए । *5*

(a) What is a double displacement reaction ? Explain with an example.

(b) A small amount of quick lime is added to water in a beaker.

(i) Name and define the type of reaction that has taken place.

(ii) Write balanced chemical equation for the above reaction and the chemical name of the product formed.

(iii) List two main observations of this reaction.

OR

(a) Design an activity to demonstrate the decomposition reaction of lead nitrate.

(b) Draw labelled diagram of the experimental set-up. List two main observations.

(c) Write balanced chemical equation for the reaction stating the physical state of the reactant and the products.

17. (a) प्रत्येक के लिए रासायनिक समीकरण लिखकर एस्टरीकरण और साबुनीकरण अभिक्रियाओं के बीच विभेदन कीजिए ।

(b) विद्यालय की प्रयोगशाला में किसी एस्टर का बनना दर्शाने के लिए कोई क्रियाकलाप लिखिए । *5*

(a) Distinguish between esterification and saponification reactions with the help of chemical equation for each.

(b) Write an activity to show the formation of an ester in a school laboratory.

18. (a) जनन किसे कहते हैं ? इसके दो प्रकारों की सूची बनाइए ।

(b) एककोशिकीय जीवों और बहुकोशिकीय जीवों में जनन की विधाएँ किस प्रकार भिन्न होती हैं ? *5*

अथवा

(a) लैंगिक संचरित रोग (STD) क्या होते हैं ? दो जीवाणु जनित और दो वायरस संक्रमित लैंगिक संचरित रोगों की सूची बनाइए ।

(b) गर्भ निरोध किसे कहते हैं ? गर्भ निरोधक उपायों को अपनाने के तीन कारणों की सूची बनाइए । *5*

(a) What is reproduction ? List its two types.

(b) How are the modes of reproduction different in unicellular and multicellular organisms ?

OR

(a) What are Sexually Transmitted Diseases (STD) ? List two viral and two bacterial STDs.

(b) What is contraception ? List three reasons for adopting contraceptive methods.

19. (a) समतल दर्पणों द्वारा बने प्रतिबिम्बों के चार अभिलक्षणों की सूची बनाइए ।

(b) कोई 5 cm ऊँचा बिम्ब 30 cm फोकस दूरी के किसी अवतल दर्पण से 20 cm दूरी पर स्थित है । दर्पण सूत्र का उपयोग करके बनने वाले प्रतिबिम्ब की स्थिति और साइज़ निर्धारित कीजिए । *5*

(a) List four characteristics of the images formed by plane mirrors.

(b) A 5 cm tall object is placed at a distance of 20 cm from a concave mirror of focal length 30 cm. Use mirror formula to determine the position and size of the image formed.

20. (a) R_1, R_2 और R_3 प्रतिरोधों के तीन प्रतिरोधक (i) श्रेणीक्रम में, तथा (ii) पार्श्वक्रम में संयोजित हैं । प्रत्येक प्रकरण में संयोजन के तुल्य प्रतिरोध के लिए व्यंजक लिखिए ।

(b) 12 Ω के दो सर्वसम प्रतिरोधक 3 V की किसी बैटरी से संयोजित हैं । निम्नतम प्रतिरोध और अधिकतम प्रतिरोध के परिणामी संयोजनों द्वारा उपभुक्त शक्तियों का अनुपात परिकलित कीजिए । *5*

अथवा

(a) लम्बाई '*l*' और अनुप्रस्थ-काट क्षेत्रफल 'A' के बेलनाकार आकृति के किसी चालक के प्रतिरोध और उसके पदार्थ की वैद्युत प्रतिरोधकता के बीच संबंध लिखिए । इस प्रकार वैद्युत प्रतिरोधकता का S.I. मात्रक व्युत्पन्न कीजिए ।

(b) 5 m लम्बे किसी धातु के तार का प्रतिरोध 100 Ω है । यदि इस तार की अनुप्रस्थ-काट का क्षेत्रफल 3×10^{-7} m^2 है, तो धातु की प्रतिरोधकता परिकलित कीजिए । *5*

(a) Three resistors of resistances R_1, R_2 and R_3 are connected (i) in series, and (ii) in parallel. Write expressions for the equivalent resistance of the combination in each case.

(b) Two identical resistors of 12 Ω each are connected to a battery of 3 V. Calculate the ratio of the power consumed by the resulting combinations with minimum resistance and maximum resistance.

OR

(a) Write the relation between resistance and electrical resistivity of the material of a conductor in the shape of a cylinder of length '*l*' and area of cross-section 'A'. Hence derive the S.I. unit of electrical resistivity.

(b) Resistance of a metal wire of length 5 m is 100 Ω. If the area of cross-section of the wire is 3×10^{-7} m^2, calculate the resistivity of the metal.

21. (a) किसी एकसमान चुम्बकीय क्षेत्र में क्षेत्र के लम्बवत् स्थित धारावाही सीधे चालक द्वारा अनुभव किए जाने वाले बल की दिशा निर्धारित करने वाले नियम का नाम और नियम लिखिए ।

(b) विद्युत् मोटर का नामांकित आरेख खींचिए । *5*

(a) 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.

(b) Draw a labelled diagram of an electric motor.

भाग य
SECTION E

22. दो बीकरों में फेरस सल्फेट के विलयन भरे हैं और इनमें एक में कॉपर की पत्री और दूसरे में ऐलुमिनियम की पत्री डालने के लगभग 1 घण्टे के पश्चात् क्या प्रेक्षण होंगे ? यदि रंग में कोई परिवर्तन पाया जाता है, तो होने वाली अभिक्रिया का नाम तथा अभिक्रिया का रासायनिक समीकरण भी लिखिए । *2*

अथवा

कोई छात्र फेरस सल्फेट क्रिस्टल लेकर विखण्डन (वियोजन) अभिक्रिया का अध्ययन करना चाहता है । इस प्रयोग को करते समय उसके द्वारा बरती जाने वाली दो सावधानियाँ लिखिए । *2*

What is observed after about 1 hour of adding the strips of copper and aluminium separately to ferrous sulphate solution filled in two beakers ? Name the reaction if any change in colour is noticed. Also, write chemical equation for the reaction.

OR

A student wants to study a decomposition reaction by taking ferrous sulphate crystals. Write two precautions he must observe while performing the experiment.

23. एथेनॉइक अम्ल के नीचे दिए गए गुणधर्मों का अध्ययन करते समय आप जो निष्कर्ष निकालेंगे उनकी सूची बनाइए : *2*

(a) गंध

(b) जल में विलेयता

(c) लिटमस पत्र पर प्रभाव

(d) सोडियम हाइड्रोजन कार्बोनेट के साथ अभिक्रिया

List the conclusions you will draw while studying the following properties of ethanoic acid :

(a) Odour

(b) Solubility in water

(c) Effect on litmus paper

(d) Reaction with sodium hydrogen carbonate

24. किसी छात्र ने "श्वसन की अवधि में CO_2 निकलती है" को दर्शाने के लिए उपकरण व्यवस्थित कर लिया है । लगभग 1 घण्टे के पश्चात् वह निकास नली में जल के तल में कोई अन्तर नहीं पाता । प्रयोग की असफलता के दो संभावित कारण लिखिए । *2*

A student has set up an apparatus to show that "CO_2 is released during respiration". After about 1 hour he observes no change in the water level in the delivery tube. Write two possible reasons for the failure of the experiment.

25. रंध्रों का प्रेक्षण करने के लिए पत्ती के छिलके का अस्थायी आरोपण तैयार करने के प्रयोग में हम जल के अतिरिक्त दो अन्य द्रवों का उपयोग करते हैं । इन द्रवों के नाम लिखिए और उल्लेख कीजिए कि ये द्रव कब और क्यों उपयोग किए जाते हैं । *2*

अथवा

उन चार सावधानियों की उचित क्रम में सूची बनाइए जिनका पालन हम पत्ती के छिलके का अस्थायी आरोपण तैयार करते समय करते हैं । *2*

In the experiment of preparing a temporary mount of a leaf peel to observe stomata, we use two liquids other than water. Name these two liquids and state when and why these liquids are used.

OR

List four precautions in proper sequence which we observe while preparing a temporary mount of a leaf peel.

26. किसी दूरस्थ बिम्ब का प्रतिबिम्ब प्राप्त करके दिए गए अवतल दर्पण की सन्निकट फोकस दूरी निर्धारित करने के प्रयोग को करने की विधि के चरणों की क्रमवार सूची बनाइए । *2*

अथवा

किसी छात्र को आपतन कोण के चार विभिन्न मानों के लिए काँच के आयताकार स्लैब से गुज़रने वाली प्रकाश किरण का पथ आरेखित करना है ।

(a) इस प्रयोग की दो महत्त्वपूर्ण सावधानियों की सूची बनाइए ।

(b) इस प्रयोग पर आधारित छात्र द्वारा निकाले गए दो निष्कर्षों की सूची बनाइए । *2*

List in proper sequence the steps of the experiment for determining the approximate focal length of a given concave mirror by obtaining the image of a distant object.

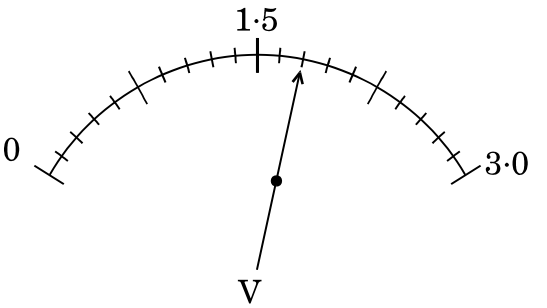
OR

A student has to trace the path of a ray of light passing through a rectangular glass slab for four different values of angle of incidence.

(a) Write two important precautions for this experiment.

(b) List two conclusions the student will draw based on his experiment.

27. आरेख में दर्शाए गए वोल्टमीटर के पैमाने पर विचार कीजिए और निम्नलिखित प्रश्नों के उत्तर दीजिए :

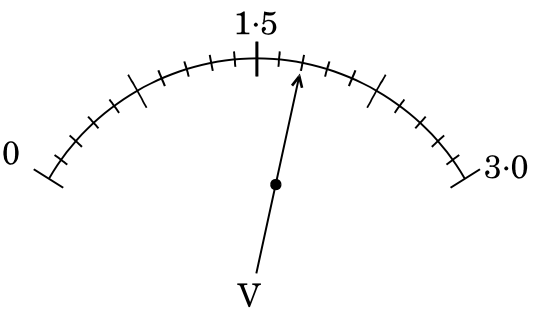


(a) वोल्टमीटर का अल्पतमांक क्या है ?

(b) वोल्टमीटर का पाठ्यांक क्या है ?

(c) यदि यह वोल्टमीटर किसी 20 Ω के प्रतिरोधक के सिरों से संयोजित है, तो प्रतिरोधक से कितनी धारा प्रवाहित हो रही है ? *2*

Consider the scale of a voltmeter shown in the diagram and answer the following questions :



(a) What is the least count of the voltmeter ?

(b) What is the reading shown by the voltmeter ?

(c) If this voltmeter is connected across a resistor of 20 Ω, how much current is flowing through the resistor ?

Strictly Confidential: (For Internal and Restricted use only)
Secondary School Examination
March 2019
Marking Scheme– SCIENCE (SUBJECT CODE 086)
(PAPER CODE–31/3/1)

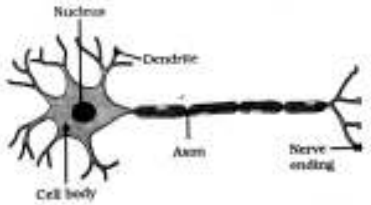
General Instructions: -

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. **Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best efforts in this process.**
2. 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.**
3. 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.
4. 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.
5. If a question does not have any parts, marks must be awarded in the left hand margin and encircled.
6. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
7. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
8. A full scale of marks 1 to 80 has to be used. Please do not hesitate to award full marks if the answer eserves it.
9. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 25 answer books per day.
10. 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 transfer of marks from the inside pages of the answer book to the title page.
- Wrong question wise totaling on the title page.
- Wrong totaling 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.

11. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as (X) and awarded zero (0) Marks.
12. Any unassessed portion, non-carrying over of marks to the title page, or totaling 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.
13. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
14. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
15. 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–SCIENCE (Code No.31/3/1) SET-I

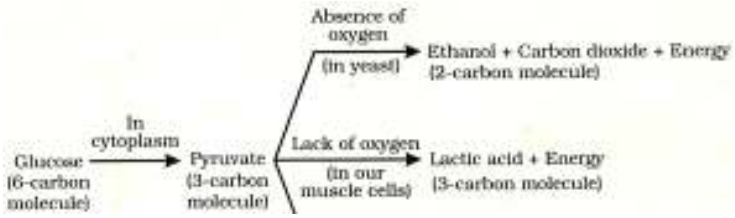
<table>
<tr><th>Q.N</th><th>Key Points</th><th>Marks</th><th>Grand Marks</th></tr>
<tr><td>1</td><td>Resistance of material / conductor whose area of cross section is $1m^2$ and length 1 meter.</td><td>1</td><td>1</td></tr>
<tr><td>2</td><td>The two main components of an ecosystem are
a) Biotic b) Abiotic</td><td>½ + ½</td><td>1</td></tr>
<tr><td>3</td><td>• The compound formed by the combination of ions/ formed by transfer of electrons.
• Movement of ions in the solid is not possible due to the rigid structure / strong electrostatic attraction/ no free ions.</td><td>1
1</td><td>2</td></tr>
<tr><td>4</td><td>When tendril comes in contact with any support
• Auxin diffuses towards the part away from the contact.
• The part in contact with support does not grow as rapidly as the part of tendril away from the support causing the tendril to coil around the support.
OR
Nerve impulse – an electrical signal transmitted along a nerve fibre.
This impulse travels from the dendrite to the cell body and then along the axon to its end. (can be explained by labeled diagram)
 
</td><td>2
½
1 ½</td><td>2</td></tr>
<tr><td>5</td><td>When sunlight passes through the atmosphere, the fine particles in the air scatter the blue colour (short wavelength) more strongly than red. The scattered blue colour enters our eyes.</td><td>2</td><td>2</td></tr>
<tr><td>6</td><td>• The concentration of H^+ ions determines the nature of solutions whether it is acidic or basic.
• Yes, basic solution have H^+ ions
• The concentration of OH^- ions is more than H^+ ions in basic solution.</td><td>1
½
1½</td><td>3</td></tr>
<tr><td>7</td><td><table><tr><th>Activity</th><th>Observation</th><th>Inference</th></tr><tr><td>Put metal R in the sulphate solution of metal Q and P

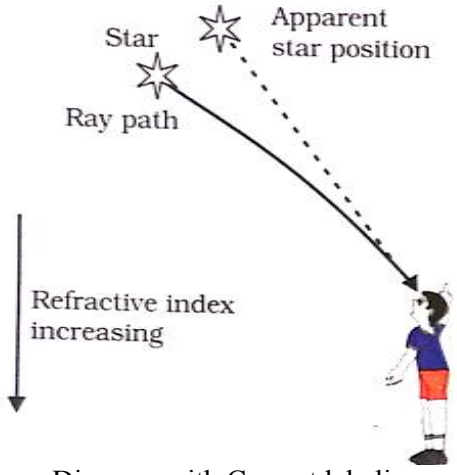
Put metal P in the solution of sulphate ions of metal Q</td><td>Solution becomes colourless in both the test tubes.

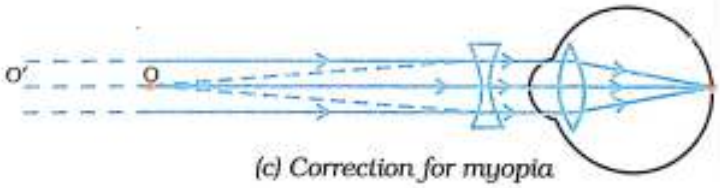
No reaction</td><td>R displaces P and Q ions from their solutions.

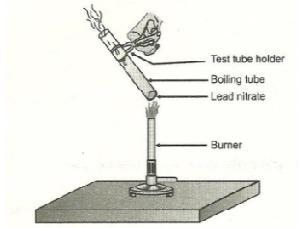
P cannot displace Q ions from the solution</td></tr></table>So the P < Q < R</td><td>1

1</td><td></td></tr>
</table>

	(From activity to inference award 1 mark) OR Cinnabar / (HgS) $2HgS + 3O_2 \rightarrow 2HgO + 2SO_2$ $2HgO \xrightarrow{\Delta} 2Hg(l) + O_2$ (Complete process explained in the form of sentence full credit may be given.)	1 1 1 1	3
8	Atomic number 13(2, 8, 3) element has electropositive character, belongs to group 13 and has valency 3.	1+1+1	3
9	Four function of human heart: • Receives deoxygenated blood from body • Sends blood to lungs for oxygenation • Receives oxygenated blood from lungs • Pumps oxygenated blood to different parts of body (or complete functioning of heart with correct description) • To have efficient supply of O_2 for their high energy needs. Separation of oxygenated and deoxygenated blood.	½ x 4 ½ + ½	3
10	The first step in the breakdown of glucose. Glucose is converted to pyruvate. - Pyruvate in the absence of O_2 may be converted to ethanol, CO_2 and energy - Pyruvate in the shortage of O_2 may be converted to lactic acid and energy. OR  	1 1 1	3
11	<table><tr><th>Cerebrum</th><th>Cerebellum</th></tr><tr><td>1) It is a part of fore brain 2) It initiates intelligence, memory, voluntary movements etc., 3) Main thinking part of the brain.</td><td>1) It is a part of hind brain 2) It maintains posture and equilibrium 3) Controls voluntary actions like walking in a straight line, picking up a pencil, riding a bicycle etc.</td></tr></table>	½ + ½ ½ + ½ ½ + ½	3
12.	a) Speciation: It refers to the process by which new species are	1	

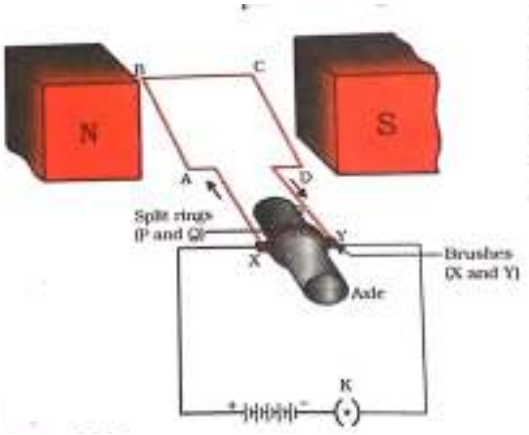
	formed from the pre-existing species i) Geographical isolation ii) Genetic drift iii) Natural selection (b) Natural selection is the process by which organisms having some special features are at an advantage for better survival in the changed environment. (Or explanation with the help of the any example) **OR** • F_1 generation – all plants with round seeds • F2 generation – plants with round and wrinkled seeds. • Tall / dwarf plants Yellow / green seeds White / purple flowers (any two)	½ 1½ 1 ½ + ½ ½ + ½	3
13	• Bending of light due to the variation in optical density of the medium. • The starlight, on entering into earth's atmosphere undergoes continuous refraction before it reaches the earth. • The since the atmosphere bends starlight towards the normal, the apparent position to the star is slightly different from its actual position.  Diagram with Correct labeling OR (i) If the student cannot see the words written on the black board then he is considered myopic. (ii) The defect may arise due to 1) Excessive curvature of the eyeball 2) Elongation of the eyeball (iii)	½ ½ ½ 1½ 1 ½ x 2	

	 (c) Correction for myopia	1	3
14	(i) • Biogas • Wind energy • Solar energy } Any two • Tidal wave • Geothermal (ii) • Because these are renewable sources of clean energy. • All of these energy sources are pollution free • Do not release any harmful substance. • Do not cause pollution (or any other)	½ + ½ ½ + ½ ½ + ½	3
15	Forests are rich reservoir of biodiversity containing a large number of plants and animals. Approaches towards conservation of forests: a) Help of local people should be taken / local people should be involved b) Indiscriminate destruction of forest should be strictly prohibited. c) Planting of trees should be increased. d) Destruction of forests should not be done for making, roads, dams and hotels etc.	1 ½ x 4	3
16	(a) Exchange of ions in a reaction between two. (b) $Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2\ NaCl$ (If the answer is in descriptive form award marks) (b) (i) Combination reaction: A combination reaction is a reaction where two or more elements or compounds combine to form a single compound. (ii) $CaO + H_2O \rightarrow Ca(OH)_2$ Quick lime Calcium Hydroxide	1 1 ½ + ½ ½	

	Chemical name of the product formed - (Calcium hydroxide (slaked lime) (iii) Observations of the reactions: - Reaction takes place vigorously - Large amount of heat is released. OR (a) Activity : Take a pinch of lead nitrate powder in a test tube. Heat it over the flame.  (½ marks for labeling) (b) Observation : • Emission of brown fumes observed • Reddish brown colour of residue (any one) (c) $2Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s) + 4NO_2(g) + O_2(g)$ Lead nitrate → Lead oxide, Nitrogen dioxide, Oxygen	½ ½ + ½ 1 1 ½ + ½ 1+1	5 5
17	Esterification $CH_3COOH + CH_3CH_2OH \xrightarrow{Acid} CH_3COOC_2H_5 + H_2O$ Ethanoic Acid Ethanol → Ethyl ethanoate Saponification $CH_3COOC_2H_5 \xrightarrow{NaOH} C_2H_5OH + CH_3COONa$ Ethyl ethanoate → Ethanol Sodium Acetate b) • Take 1 ml of ethanol and 1ml of glacial acetic along with a few drops of concentrated sulphuric acid in a test tube. • Warm in a water bath for at least 5 minutes. • Pour into a beaker containing 20-20 ml of water and fruity smell the remelting mixture. • Ester is formed.	1½ 1½ ½ x 4	5
18	a) **Reproduction-** The process of producing offsprings / young ones of its own kind. Types: i) Asexual ii) Sexual **b)**	1 1 1	

	Unicellular Organisms / **Multicellular Organisms** 1) Only one parent is required / Two parents are required 2) It is a fast process of reproduction. / Slower process of reproduction than in unicellular organisms. 3) No specialized cells are required for reproduction. / Specialized cells are required for reproduction. **(Any two points)** **OR** a) STD- A disease that can be transmitted through sexual contact. • Viral – i)Warts ii) AIDS • Bacterial- i) Gonorrhoea ii) Syphilis b) Contraception: The method of preventing unwanted pregnencies, Reasons – i) To prevent unwanted pregnancies ii)To control population rise / birth rate iii)To prevent transfer of STD's iv)Proper gap between successive births v)For the better health of mother (Any three)	1 1 1 ½ + ½ ½ + ½ ½ ½ x3	5
19	(a) Characteristics: i) The image is same size as the object. ii) The image is erect and virtual. iii) The image is laterally inverted. iv) The distance between the object and mirror is same as the distance between image and mirror. (b) h = 5cm u = – 20cm f = – 30 $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{-30} + \frac{1}{-20}$ v = –60cm $\frac{h'}{h} = \frac{v}{u}$ *h' = 15cm* *Size - enlarged*	½x4 ½ 1 ½ ½ ½	5

20	(a) • In series - $R_S=R_1+R_2+R_3$. • In parallel - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}$ Resistance is at minimum - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}$ $\frac{1}{12}+\frac{1}{12}=\frac{2}{12}=6\Omega$ Resistance is maximum - $R_S=R_1+R_2$ $R_s=12+12=24\ \Omega$ $P=\frac{v^2}{R}$ Power ration in parallel and series = 4:1 (b) $\frac{P_{min}}{P_{max}}=\frac{V^2/R_{min}}{V^2/R_{max}}=\frac{R_{max}}{R_{min}}=\frac{24}{6}=\frac{4}{1}$ OR (a) $R\alpha l$ $R\alpha\frac{1}{A}$ $R\alpha\frac{l}{A}$ $R=\rho\frac{l}{A}$ $\rho=\frac{RA}{l}=\frac{ohm\times m^2}{m}$ $=ohm\times m$ (b) $\rho=\frac{RA}{l}$ $=\frac{100\times3\times10^{-7}}{5}$ $=60\times10^{-7}\ ohm\times m$	½ ½ 1 1 2 ½ x 6 ½ ½ 1	5
21	(a)		

	• The rule is Fleming's left hand rule. • If the finger points in the direction of the magnetic field and the second finger in the direction of the 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 (b) Electric motor.  	1 2 2	5
22	• Putting Cu strips in $FeSO_4$ --- no reaction • Putting Al strips in $FeSO_4$ -- change in colour observed • Displacement reaction • $Al+FeSO_4 \rightarrow Al_2(SO_4)_3+Fe$ (OR) 1) Do not point the mouth of boiling tube at your neighbours or yourself / point the test tube away from the body 2) Hold the test tube in inclined position 3) Hold the test tube with Tongs (Any two)	½ ½ ½ ½ 1+1	2
23	Ethanoic acid a) Odour – it smells like vinegar b) It is soluble in water c) Blue litmus to red d) $NaHCO_3 + CH_3COOH \rightarrow CH_3COONa + H_2O + CO_2$	 ½ ½ ½ ½	2
24	i) Conical flask is not air tight. ii) Freshly prepared solution of KOH not used. iii) Germinating seeds may be dry. (any two)	 1+1	2
25	a) Saffranin is used to stain the material for better view. b) Glycerine is used to avoid drying of peel. OR i) Take a thin peel of leaf on a glass slide.	1 1 ½	

	ii) Stain it with saffranin iii) Remove extra stain iv) Put a drop of glycerin and cover it with cover slip	½ ½ ½	2
26	i) Fix a concave mirror on a stand and place it near a source of bright light ii) Place a screen fitted on a stand in front of the mirror iii) Move the screen back and forth, until a sharp and clear image of a distance object line a tree is obtained on the screen iv) Mark the position of mirror and screen on the scale and note the distance between them OR The student should take the following precaution (a) Precaution - (i)See that the pins are in a straight line and atleast 3cm apart. (ii)Angle of incidence should be between 30^0 to 60^0. (iii) Glass slab should always remain inside the boundary. (any two) (b) Conclusion - (i) The emergent ray is parallel to incident ray (ii) Lateral displacement takes place. (iii) Angle of incidence = Angle of emergence (any two)	½x4 ½ ½ ½ ½	2
27	a) 0.15V is the least count b) The reading shown is 1.8V $c)$ $R = 20\Omega$ V=1.8V I=$\frac{V}{R} = \frac{1.8}{20} = .09amp$	½ ½ 1	2