SUMMATIVE ASSESSMENT – II

SCIENCE

Serial Number : 31/2/3

Time allowed : 3 hours

Maximum Marks : 90

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General Instructions:

(i) The question paper comprises two sections, A and B. You are to attempt both the sections.

(ii) All questions are compulsory.

(iii) There is no choice in any of the questions.

(iv) All questions of Section A and all questions of Section B are to be attempted separately.

(v) Question numbers 1 to 3 in Section A are one mark questions. These are to be answered in one word or in one sentence.

(vi) Question numbers 4 to 6 in Section A are two marks questions. These are to be answered in about 30 words each.
(vii) Question numbers 7 to 18 in Section A are three marks questions. These are to be answered in about 50 words each.

(viii) Question numbers 19 to 24 in Section A are five marks questions. These are to be answered in about 70 words each.

(ix) Question numbers 25 to 33 in Section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.

(x) Question numbers 34 to 36 in Section B are two marks questions based on practical skills. These are to be answered in brief.

भाग अ

SECTION A

1. ऐल्काइनों की समजातीय श्रेणी के पहले सदस्य का नाम और उसका आण्विक सूत्र लिखिए।
   Write the name and molecular formula of the first member of the homologous series of alkynes.

2. डी.एन.ए. क्या है?
   What is DNA?

3. प्राकृतिक पारिस्थितिक के दो उदाहरणों की सूची बनाइए।
   List two examples of natural ecosystem.

4. नामांकित आरेख खींचकर आकाश में इलाक्षक बनाना स्पष्ट कीजिए।
   Draw a labelled diagram to explain the formation of a rainbow in the sky.

5. प्राकृतिक संसाधनों के संपेलित प्रबन्धन के दो लाभ लिखिए। पुनःउपयोग और पुनःचक्रण में से कौन-सा बेहतर है और क्यों?
   Write two advantages of sustainable management of natural resources. Out of the two – reuse and recycle – which is better and why?

6. जल के भीम जल के रूप में संरक्षण के चार लाभों की सूची बनाइए।
   List four advantages of conserving water in the form of ground water.
7. Write the name and structural formula of the compound formed when ethanol is heated at 443 K temperature with excess of conc. H₂SO₄. What is the role of conc. H₂SO₄ in this reaction? Also give the chemical equation for the reaction.

8. What is meant by functional group in carbon compounds? Write in tabular form the structural formula and the functional group present in the following compounds:

(i) Ethanol
(ii) Ethanoic acid

9. Four elements P, Q, R and S belong to the third period of the Modern Periodic Table and have respectively 1, 3, 5 and 7 electrons in their outermost shells. Write the electronic configurations of Q and R and determine their valences. Write the molecular formula of the compound formed when P and S combine.
10. In the following table, the positions of six elements A, B, C, D, E and F are given as they are in the Modern Periodic Table:

<table>
<thead>
<tr>
<th>Group</th>
<th>Period</th>
<th>1</th>
<th>2</th>
<th>3 – 12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>E</td>
<td></td>
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<td></td>
<td></td>
<td>F</td>
</tr>
</tbody>
</table>

On the basis of the above table, answer the following questions:

(i) Name the element which forms only covalent compounds.
(ii) Name the element which is a metal with valency three.
(iii) Name the element which is a non-metal with valency three.
(iv) Out of B and C, whose atomic radius is bigger and why?
(v) Write the common name for the family to which the elements D and F belong.
11. Draw a diagram of the longitudinal section of a flower exhibiting germination of pollen on stigma and label (i) ovary, (ii) male germ-cell, (iii) female germ-cell and (iv) ovule on it.

12. Explain any three advantages of vegetative propagation.

13. What is placenta? Explain its function in humans.

14. “It is possible that a trait is inherited but may not be expressed.” Give a suitable example to justify this statement.

15. “It is a matter of chance whether a couple will have a male or a female child.” Justify this statement by drawing a flow chart.

16. A student wants to project the image of a candle flame on a screen 80 cm in front of a mirror by keeping the candle flame at a distance of 20 cm from its pole.

   (i) Which type of mirror should the student use?
   (ii) Find the magnification of the image produced.
   (iii) Find the distance between the object and its image.
   (iv) Draw a ray diagram to show the image formation in this case and mark the distance between the object and its image.
17. What is meant by advance sunrise and delayed sunset? Draw a labelled diagram to explain these phenomena.

18. “Energy flow in food chains is always unidirectional.” Justify this statement. Explain how the pesticides enter a food chain and subsequently get into our body.

19. What is speciation? List four factors that could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species? Explain.

20. (a) List the organs A, B, C and D in the diagram.

(b) Name one of the major structures shown.

(c) Identify the part of the plant during the process of fertilization. Write the name of the part in each step:
   (i) Seed is developed,
   (ii) Fruit is developed.
Identify A, B, C and D in the given diagram and write their names.

What is pollination? Explain its significance.

Explain the process of fertilization in flowers. Name the parts of the flower that develop after fertilization into
(i) seed,
(ii) fruit.

What is meant by the power of a lens? What is its S.I. unit? Name the type of lens whose power is positive.

The image of an object formed by a lens is real, inverted and of the same size as the object. If the image is at a distance of 40 cm from the lens, what is the nature and power of the lens? Draw ray diagram to justify your answer.

22. कोई छात्र अवतल दर्पण द्वारा मोमबत्ती की ज्वाला का प्रतिबिंब श्वेत पद्दें पर फोकसित करता है। परिस्थिति नीचे दिए गए अनुसार है:

ज्वाला की लम्बाई = 1.5 cm
दर्पण की फोकस दूरी = 12 cm
ज्वाला की दर्पण से दूरी = 18 cm

यदि ज्वाला दर्पण के मुख्य अक्ष के लम्बवल्त् है, तो निम्नलिखित का परिकल्पन कीजिए:
(a) प्रतिबिंब की दर्पण से दूरी
(b) प्रतिबिंब की लम्बाई

यदि ज्वाला की दर्पण से दूरी 10 cm कर दी जाए, तो पद्दें पर क्या दिखाई देगा? अपने उत्तर की पुष्टि इस परिस्थिति के लिए किरण आरेख खींचकर कीजिए.
A student has focused the image of a candle flame on a white screen using a concave mirror. The situation is as given below:

- Length of the flame = 1.5 cm
- Focal length of the mirror = 12 cm
- Distance of flame from the mirror = 18 cm

If the flame is perpendicular to the principal axis of the mirror, then calculate the following:

(a) Distance of the image from the mirror
(b) Length of the image

If the distance between the mirror and the flame is reduced to 10 cm, then what would be observed on the screen? Draw ray diagram to justify your answer for this situation.

23. मानव नेत्र के निम्नलिखित प्रत्येक भाग का कार्य लिखिए:
(i) कॉर्निया 
(ii) परितारिका 
(iii) पुतली 
(iv) रेटिना

विकासशील देशों के करोड़ों व्यक्ति कॉर्निया अंधता से पीड़ित हैं। इस रोग को नेत्रदान द्वारा प्राप्त कॉर्निया के प्रत्यारोपण से ठीक किया जा सकता है। आपका विद्यालय इस तथ्य के बारे में जागरूकता उत्पन्न करने और मृत्यु के पश्चात् लोगों को नेत्रदान के लिए प्रेरित करने के उद्देश्य से विद्यालय और उसके पड़ोस में अभियान चला रहा है। आप आपके सहयोगियों के साथ मिलकर इस पुण्य कार्य में किस प्रकार योगदान कर सकते हैं? विद्यालयों द्वारा इस प्रकार के अभियानों के चलने के उद्देश्य लिखिए।

State the function of each of the following parts of the human eye:
(i) Cornea
(ii) Iris
(iii) Pupil
(iv) Retina

Millions of people of the developing countries are suffering from corneal blindness. This disease can be cured by replacing the defective cornea with the cornea of a donated eye. Your school has organised a campaign in the school and its neighbourhood in order to create awareness about this fact and motivate people to donate their eyes after death. How can you along with your classmates contribute in this noble cause? State the objectives of organising such campaigns in schools.
Elements forming ionic compounds attain noble gas electronic configuration by either gaining or losing electrons from their valence shells. Explain giving reason why carbon cannot attain such a configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compounds formed by carbon. Also explain with reason why carbon compounds are generally poor conductors of electricity.

**SECTION B**

25. A student obtained on a screen the sharp image of a candle flame placed at the farther end of laboratory table using a concave mirror. For getting better value of focal length of the mirror, the teacher suggested to him to focus the sun. What should the student do?

(A) Should move the mirror away from the screen.
(B) Should move the mirror towards the screen.
(C) Should move the mirror and screen both towards the sun.
(D) Should move only the screen towards the sun.
26. While determining the focal length of a convex lens, you try to focus the image of a distant object formed by the lens on the screen. The image formed on the screen, as compared to the object, should be

(A) erect and highly diminished
(B) erect and enlarged
(C) inverted and enlarged
(D) inverted and highly diminished

27. नीचे दिए गए चार आरेखों में से किसमें काँच के प्रिज्म से गुजरने वाली प्रकाश किरण का पथ सही ढंग से दर्शाया गया है?

(A)  
(B)  
(C)  
(D)  

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In which of the following four diagrams is the correct path of a ray of light passing through a glass prism shown?

(A)  
(B)  
(C)  
(D)

Which of the following is the best experimental set-up out of the four shown for tracing the path of a ray of light passing through a rectangular glass slab?

(A)  
(B)  
(C)  
(D)

Which of the following is the best experimental set-up out of the four shown for tracing the path of a ray of light passing through a rectangular glass slab?
A student takes 4 mL of distilled water in each of four test tubes I, II, III and IV, and then dissolves an equal amount of four different salts namely NaCl in I, CaCl$_2$ in II, MgCl$_2$ in III and KCl in IV. He then adds 8 drops of the given soap solution to each test tube and shakes the contents of the test tube 10 times. In which test tubes will enough lather (foam) be formed?

(A) I and II  
(B) II and III  
(C) I and IV  
(D) III and IV

A student puts a drop of acetic acid first on a blue litmus paper and then on a red litmus paper. He would observe that

(A) the red litmus paper turns colourless and there is no change in the blue litmus paper.  
(B) the red litmus paper turns blue and the blue litmus paper turns red.  
(C) there is no change in the red litmus paper and the blue litmus paper turns red.  
(D) there is no change in the blue litmus paper and the red litmus paper turns blue.
While studying saponification reactions, the following comments were noted down by the students:

(I) Soap is a salt of fatty acids.

(II) The reaction mixture is basic in nature.

(III) In this reaction heat is absorbed.

(IV) This reaction is not a neutralisation reaction.

Which of these are the correct comments?

(A) I and III only
(B) I, II and III
(C) II, III and IV
(D) I and II only
In a class, students were asked to observe the models/slides/pictures of the skeletons of forelimbs and wings of different organisms. After the observations the students made the following groups of homologous structures. Select the correct group:

(A) Wings of a bird and a butterfly  
(B) Wings of a pigeon and a bat  
(C) Wings of a butterfly and a bat  
(D) Forelimbs of a cow, a duck and a lizard

33. किसी छात्र से मटर के बीज के भूने के विभिन्न भागों का अध्ययन करने के लिए कहा गया। इस प्रयोग के आवश्यक चरण नीचे दिए गए हैं:

(I) मटर के बीजों को विशुद्ध जल में भिगोकर एक रात तक भीगा रहने दीजिए।
(II) भींगे बीज को काटिए और इसके विभिन्न भागों का प्रेक्षण कीजिए।
(III) एक पेट्री डिश में कुछ मटर के बीज लीजिए।
(IV) अतिरिक्त जल को निकाल दीजिए। बीजों को गीले सूती कपड़े से ढक कर एक दिन के लिए ऐसे ही छोड़ दीजिए।

इन चरणों का सही क्रम है:

(A) III, I, IV, II  
(B) III, IV, I, II  
(C) III, I, II, IV  
(D) III, II, I, IV

A student is asked to study the different parts of an embryo of pea seeds. Given below are the essential steps for the experiment:

(I) Soak the pea seeds in plain water and keep them overnight.
(II) Cut open the soaked seed and observe its different parts.
(III) Take some pea seeds in a petri dish.
(IV) Drain the excess water. Cover the seeds with a wet cotton cloth and leave them as it is for a day.

The correct sequence of these steps is

(A) III, I, IV, II  
(B) III, IV, I, II  
(C) III, I, II, IV  
(D) III, II, I, IV
34. A student places a 8.0 cm tall object perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. He obtains a sharp image of the object on a screen placed on the other side of the lens. What will be the nature (inverted, erect, magnified, diminished) of the image he obtains on a screen? Draw ray diagram to justify your answer.

35. A student is studying the properties of acetic acid. List two physical properties of acetic acid he observes. What happens when he adds a pinch of sodium hydrogen carbonate to this acid? Write any two observations.

36. A student is viewing under a microscope a permanent slide showing various stages of asexual reproduction by budding in yeast. Draw diagrams of what he sees (in proper sequence).