

# *Bloom Science Olympiad Sample Paper 1*

Maximum Time : 60 Minutes

Maximum Marks : 60

## INSTRUCTIONS

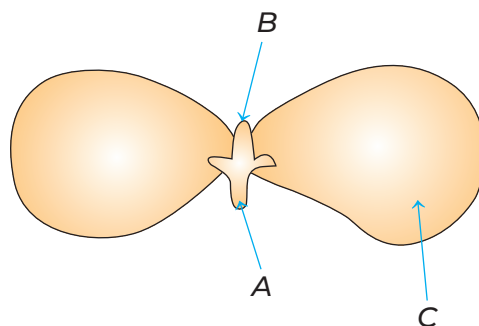
1. There are 50 Multiple Choice Questions in this paper divided into two sections :  
**Section A** 40 MCQs; 1 Mark each  
**Section B** 10 MCQs; 2 Marks each
2. Each question has Four Options out of which **ONLY ONE** is correct.
3. All questions are compulsory.
4. There is no negative marking.
5. No electric device capable of storing and displaying visual information such as calculator and mobile is allowed during the course of the exam.

Roll No.

Student's Name

## Section A (1 Mark each)

1. In the figure given below identify the parts A, B and C.



- (a) A–Cotyledon, B–Radicle, C–Plumule      (b) A–Plumule, B–Radicle, C–Cotyledon  
 (c) A–Cotyledon, B–Plumule, C–Radicle      (d) A–Radicle, B–Plumule, C–Cotyledon

2. The composition of *aqua-regia* is

- (a) Dil. HCl : Conc. HNO<sub>3</sub>  
           3            1  
 (b) Conc. HCl : Dil. HNO<sub>3</sub>  
           3            1  
 (c) Conc. HCl : Conc. HNO<sub>3</sub>  
           3            1  
 (d) Dil. HCl : Dil. HNO<sub>3</sub>  
           3            1

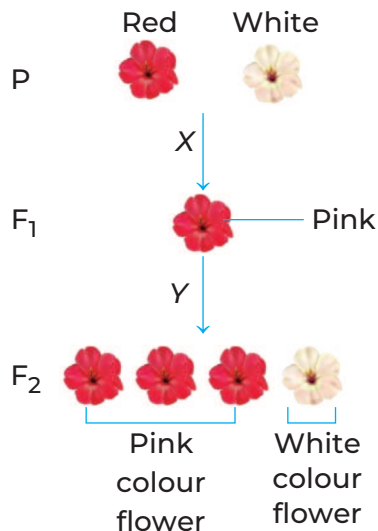
3. The magnetic field produced due to a circular wire carrying current at its centre is

- (a) at 45° to the plane of the wire      (b) at 60° to the plane of the wire  
 (c) in the plane of the wire              (d) perpendicular to the plane of the wire

4. The elements with atomic numbers 3 to 10 belong to the second period. Identify the most electropositive and the most electronegative element.

- (a) F, Li                                      (b) Ne, Li                                      (c) Li, Ne                                      (d) Li, F

5. Identify the process X and Y in the figure and their phenotypic ratio.

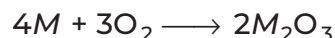


	X	Y	Phenotypic ratio
(a)	Cross fertilisation	Self-fertilisation	3 : 1
(b)	Self-fertilisation	Cross fertilisation	1 : 3
(c)	Cross fertilisation	Cross fertilisation	1 : 2 : 1
(d)	Self-fertilisation	Self-fertilisation	3 : 1

6. If a copper rod carries a direct current, the magnetic field associated with the current will be

- (a) Only inside the rod
- (b) Only outside the rod
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

7. Consider the following equation for chemical reaction of a metal  $M$ .



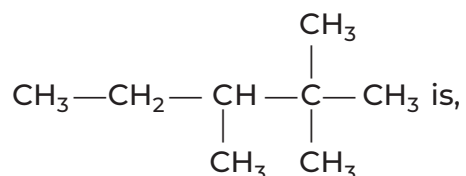
The equation represents

- (a) combination reaction as well as reduction reaction
- (b) decomposition reaction as well as oxidation reaction
- (c) oxidation reaction as well as displacement reaction
- (d) combination reaction as well as oxidation reaction

8. Which of the following is an example of homologous organ?

- (a) Forelimbs of a man and a lizard
- (b) Wings of bat and eagle
- (c) Wings of an insect and a bird
- (d) All of these

9. The IUPAC name of

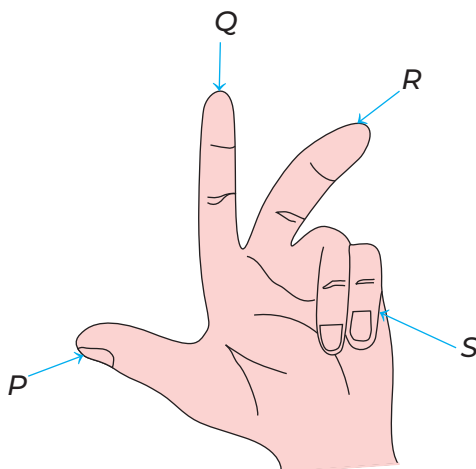


- (a) 2, 2, 3-trimethylpentane
- (b) 3, 4, 4-trimethylpentane
- (c) 2-ethyl-3, 3-dimethylbutane
- (d) 2, 3 dimethylhexane

10. Why are disposable plastics plates should not be used?

- (a) They are made up of biodegradable material
- (b) They are made up of material with light weight
- (c) They are made up of toxic material
- (d) They are made up of non-biodegradable material

11. Which of the labelling in the given figure shows the direction of current using Fleming's left hand rule?



- (a) P                      (b) Q                      (c) R                      (d) S
12. Which of the following gives the correct increasing order of acidic strength?  
(a) Water < acetic acid < hydrochloric acid    (b) Water < hydrochloric acid < acetic acid  
(c) Acetic acid < water < hydrochloric acid    (d) Hydrochloric acid < water < acetic acid
13. If a frog is eaten by a snake, then the energy transfer will be from  
(a) producer to consumer                      (b) secondary to primary consumer  
(c) tertiary to secondary consumer            (d) secondary to tertiary consumer
14. What happens to the overall resistance of the electric circuit in parallel connection due to which the current supplied from the power is low?  
(a) Increases                                      (b) Decreases  
(c) Remains same                                (d) Becomes zero
15. In which of the following chemical equations, the abbreviations represent the correct states of the reactants and product involved at reaction temperature?  
(a)  $2\text{H}_2(l) + \text{O}_2(l) \longrightarrow 2\text{H}_2\text{O}(g)$                       (b)  $2\text{H}_2(g) + \text{O}_2(l) \longrightarrow 2\text{H}_2\text{O}(l)$   
(c)  $2\text{H}_2(g) + \text{O}_2(g) \longrightarrow 2\text{H}_2\text{O}(l)$                       (d)  $2\text{H}_2(g) + \text{O}_2(g) \longrightarrow 2\text{H}_2\text{O}(g)$
16. Who gave the idea of ecological pyramids?  
(a) Odum                      (b) Charles Elton                      (c) Tansley                      (d) Charles Darwin
17. The property of persistence of vision is used in  
(a) short sightedness    (b) long sightedness    (c) cinematography    (d) colour vision
18. Which of the following statements is not correct?  
(a) All metal carbonates react with acid to give a salt, water and carbon dioxide  
(b) All metal oxides react with water to give salt and acid  
(c) Some metals react with acids to give salt and hydrogen  
(d) Some non-metal oxides react with water to form an acid

- 19.** Which of the following pollutant in the atmosphere caused damage to the Taj Mahal?  
 (a) Pb particles (b) CO<sub>2</sub>  
 (c) SO<sub>2</sub> (d) Radioactive disintegration
- 20.** Which of the following elements will form an acidic oxide?  
 (a) An element with atomic number 7 (b) An element with atomic number 3  
 (c) An element with atomic number 12 (d) An element with atomic number 19
- 21.** If a patient is suffering from renal failure and uremia, which one of the following method is employed?  
 (a) Kidney replacement (b) Lithotripsy  
 (c) Haemodialysis (d) Kidney removal
- 22.** Read the given statements and mark the incorrect statement in the given options.  
**Statement I** Plane mirror is used to see face.  
**Statement II** Image formed by plane mirror is virtual, inverted and smaller than object.  
 (a) I only (b) II only (c) Both I and II (d) None of these
- 23.** Mendeleev predicted the existence of two elements and named them as Eka-silicon and Eka-aluminium. Identify the elements which took their positions at later stage.  
 (a) Si and Ga (b) Si and Al (c) Si and Ge (d) Ge and Ga
- 24.** Which one of the following juices secreted by human body do not contain any enzyme?  
 (a) Gastric juice (b) Saliva (c) Bile juice (d) Pancreatic juice
- 25.** According to Mendeleev's periodic law, the elements were arranged in the periodic table in the order of  
 (a) increasing atomic number (b) decreasing atomic number  
 (c) increasing atomic masses (d) decreasing atomic masses
- 26.** Peripheral nervous system consist of  
 (a) brain and spinal cord  
 (b) 12 pairs of nerves which originates from brain and 31 pairs of nerves which originates from spinal cord  
 (c) 12 pairs of nerves originating from spinal cord  
 (d) 31 pairs of nerves originating from brain
- 27.** When metal Z is added to dilute HCl solution, there is no evolution of gas. Metal Z is  
 (a) Ag (b) Na (c) K (d) Zn
- 28.** Which of the following hormones is not associated with the growth of plant?  
 (a) Auxin (b) Gibberellin (c) Cytokinin (d) Abscisic acid
- 29.** Which of the following is not a part of phloem tissue?  
 (a) Tracheids (b) Companion cells (c) Sieve tube (d) None of these

30. Manik did different observation on plane mirror and find that the magnification of plane mirror is X.

Here, X represents

- (a) 1                                      (b)  $X > 1$                                       (c)  $X < 1$                                       (d) 0

31. Calcium carbonate on heating, decomposes to give X and  $\text{CO}_2$ . X is used for manufacturing of cement. Identify X.

- (a) Sulphur dioxide                                      (b) Calcium oxide  
(c) Sulphur trioxide                                      (d) Calcium hydroxide

32. Read the following statements carefully.

**Statement I** Fossils are the preserved remains of dead plants and animals, these help to know about the extinct organisms.

**Statement II** Geographical isolation is a major factor in speciation of a self-pollinating plant species.

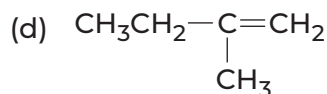
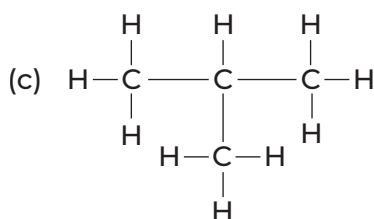
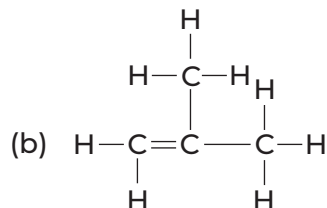
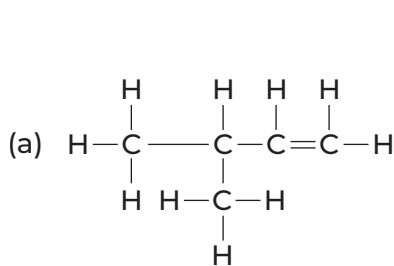
Choose the correct option.

- (a) Statement I is correct, but statement II is incorrect  
(b) Statement I is incorrect, but statement II is correct  
(c) Both statements are correct  
(d) Both statements are incorrect

33. A person needs a lens of power 2.5 dioptre to correct his far-sightedness. Which lens and of what focal length will be required by him?

- (a) Convex lens, 40 cm                                      (b) Concave lens, 40 cm  
(c) Convex lens, 0.4 cm                                      (d) Concave lens, 0.4 cm

34. Which of the following hydrocarbons represent the isomer of butene?



35. Consider the following statements.

**Statement I** Presence of *Lactobacillus* in river indicates contamination of river water.

**Statement II** Presence of coliform bacteria in river indicates contamination of river water.

Choose the correct option.

- (a) Statement I is correct  
(b) Statement II is correct  
(c) Both statements are correct  
(d) Both statements are incorrect

36. *Archaeopteryx* is the connecting link between

- (a) birds and mammals  
(b) reptiles and birds  
(c) reptiles and mammals  
(d) None of these

37. You are given water, mustard oil, glycerine and kerosene. In which of these media a ray of light incident obliquely at the same angle would be bent the most?

[Take,  $\mu$  (water) = 1.33,  $\mu$  (mustard oil) = 1.47,  $\mu$  (glycerine) = 1.473 and  $\mu$  (kerosene) = 1.44]

- (a) Kerosene  
(b) Water  
(c) Mustard oil  
(d) Glycerine

38. Some metals can be obtained by the reduction of their oxides with hydrogen.

Which line of the table is correct?

	Aluminium	Copper	Silver	Sodium
(a)	✓	✓	×	×
(b)	×	✓	✓	×
(c)	×	×	✓	✓
(d)	✓	×	✓	×

Key :

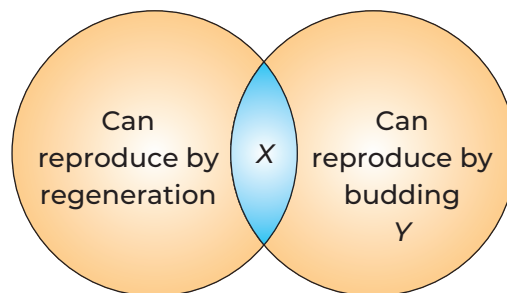
✓ = can be obtained

× = cannot be obtained

39. You are provided with a convex lens of focal length 50 cm. To obtain a smaller inverted image, the distance of the object from the lens should be

- (a) 50 cm  
(b) 75 cm  
(c) 100 cm  
(d) 105 cm

40. Refer to the given Venn diagram and identify X and Y.

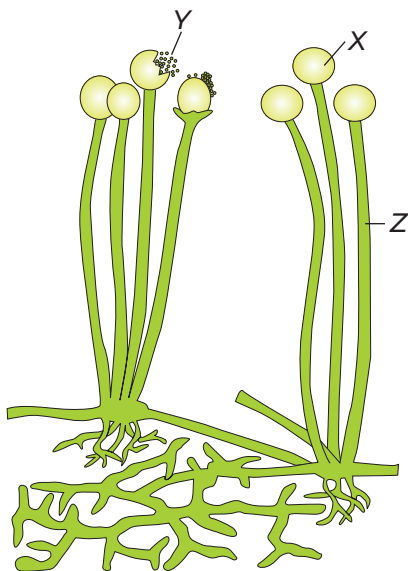


Choose the correct option.

- (a) X-*Hydra* Y-*Yeast*  
(b) X-*Amoeba* Y-*Yeast*  
(c) X-*Planaria*, Y-*Hydra*  
(d) X-*Yeast*, Y-*Hydra*

## Section-B (2 Marks each)

41. Refer to the given figure,

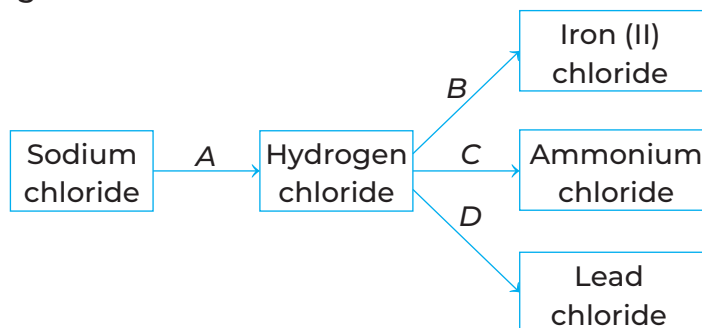


- (I) X-conidia which is a reproductive part.
- (II) Y-sporangia which develop into new individual.
- (III) Y-can easily get damaged with a sudden change in the external environment.
- (IV) Z-*Aspergillus*, reproduce by spore formation.

Choose the correct option.

- (a) III and IV are correct
- (b) II and III are correct
- (c) Only IV is correct
- (d) Only II is correct

42. Consider the following reaction.



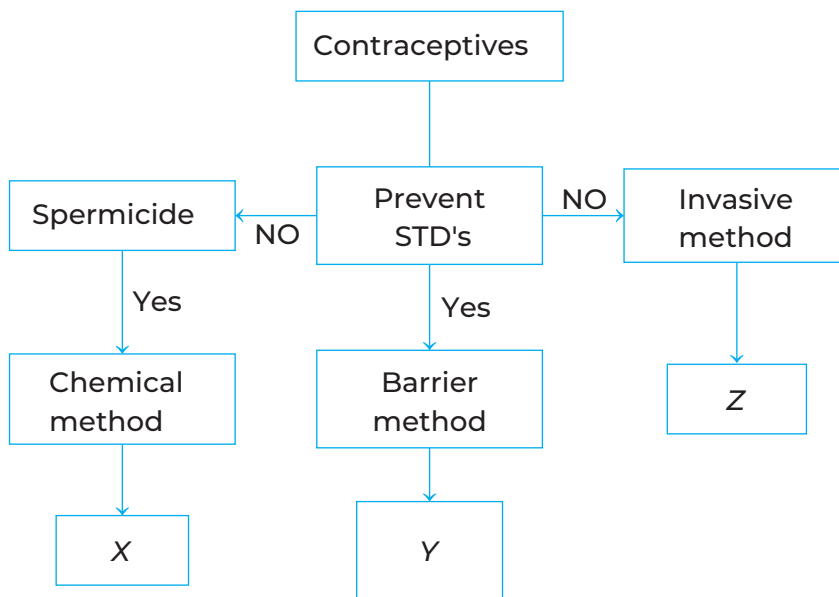
Here A, B, C and D respectively are

	A	B	C	D
(a)	conc. HCl	Fe	NH <sub>4</sub> OH	PbO
(b)	conc. H <sub>2</sub> SO <sub>4</sub>	Fe	NH <sub>4</sub> OH	Pb(NO <sub>3</sub> ) <sub>2</sub>
(c)	conc. H <sub>2</sub> SO <sub>4</sub>	Fe	NH <sub>3</sub>	Pb(NO <sub>3</sub> ) <sub>2</sub>
(d)	conc. HCl	Fe	NH <sub>3</sub>	PbO



43. A man suffering from myopia can read a book placed at 10 cm distance. For reading the book at a distance of 60 cm with relaxed vision, the power of the lens required will be  
 (a) - 8.3 D                      (b) 8.3 D                      (c) 12 D                      (d) - 12 D

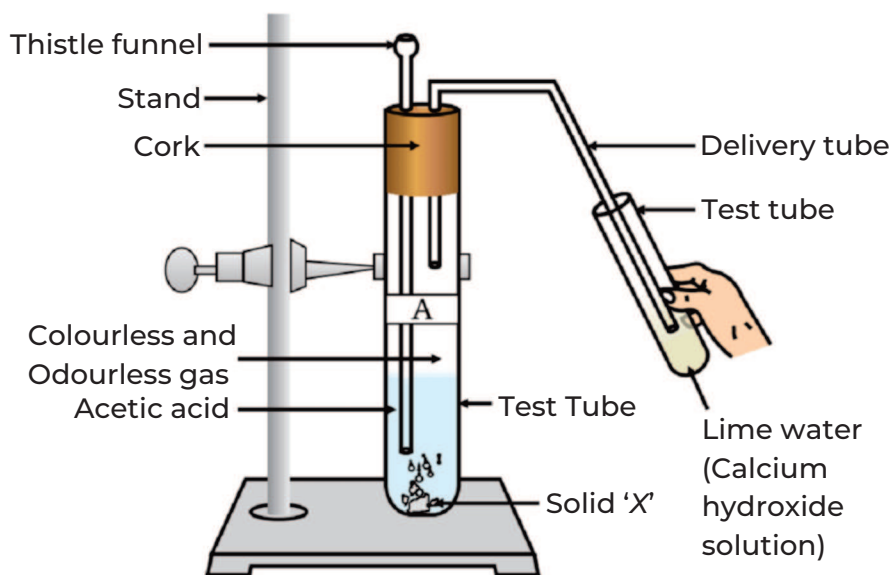
44. Refer to the given flow chart identify X, Y and Z.



- (a) X-Vaginal pills, Y-Tubectomy, Z-Copper-T    (b) X-Oral pills, Y-Condom, Z-Vasectomy  
 (c) X-Vasectomy, Y-Copper-T, Z-Tubectomy    (d) X-Vaginal pills, Y-Condom, Z-Copper-T

45. If  $n$  equal resistances are first connected in series and then connected in parallel, the ratio of the maximum to the minimum resistance is  
 (a)  $n$                       (b)  $1/n^2$                       (c)  $n^2$                       (d)  $1/n^2$

46. Acetic acid was added to a solid 'X' taken in test tube. A colourless and odourless gas was evolved. The gas was passed through lime water which turns milky. It was concluded that

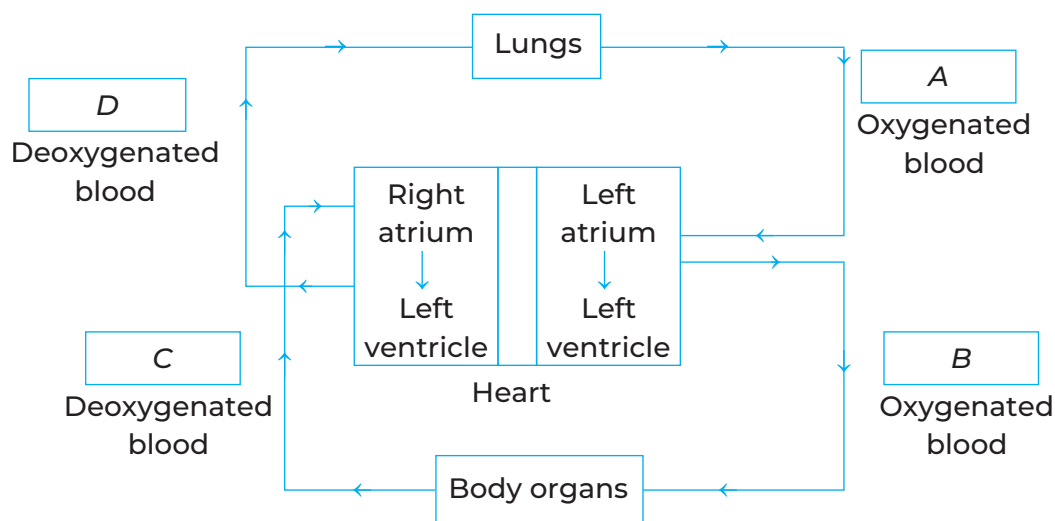


- (a) Solid X is sodium hydroxide and the gas evolved is carbon dioxide
- (b) Solid X is sodium bicarbonate and the gas evolved carbon dioxide
- (c) Solid X is sodium acetate and the gas evolved is carbon dioxide
- (d) Solid X is sodium chloride and the gas evolved is carbon dioxide

**47.** In case of four wires of same material, the resistance will be minimum when its length and diameters are respectively

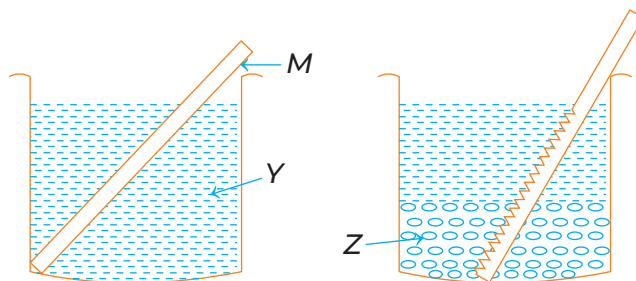
- (a)  $L$  and  $D$
- (b)  $2L$  and  $D$
- (c)  $\frac{L}{2}$  and  $2D$
- (d)  $2L$  and  $\frac{D}{2}$

**48.** Given below is the diagram of blood circulation in human body. Identify the artery and vein in A, B, C and D.



	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(a)	Vena cava	Pulmonary artery	Aorta	Pulmonary vein
(b)	Pulmonary vein	Aorta	Vena cava	Pulmonary artery
(c)	Aorta	Pulmonary vein	Pulmonary artery	Vena cava
(d)	Pulmonary artery	Vena cava	Aorta	Pulmonary vein

**49.** A metal rod ( $M$ ) was dipped in a coloured solution ( $Y$ ). After some time it was observed that the metal rod starts dissolving in the solution and the solution starts fading in colour. However, a coloured precipitate ( $Z$ ) was seen at the bottom of the beaker. ( $M$ ), ( $Y$ ) and ( $Z$ ) could be



	<b>M</b>	<b>Y</b>	<b>Z</b>
(a)	Zn	FeSO <sub>4</sub>	Fe
(b)	Cu	Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	Al
(c)	Ag	CuSO <sub>4</sub>	Cu
(d)	Fe	ZnSO <sub>4</sub>	Zn

**50.** Match the following Column I with Column II and choose the correct option from the codes given below.

<b>Column I</b>		<b>Column II</b>	
A.	Presbyopia	1.	Real image
B.	Retina	2.	Hypermetropia (or Myopia)
C.	Astigmatism	3.	Ciliary muscles
D.	Accommodation	4.	Cylindrical lenses

**Codes**

	A	B	C	D
(a)	3	1	2	4
(c)	3	1	4	2

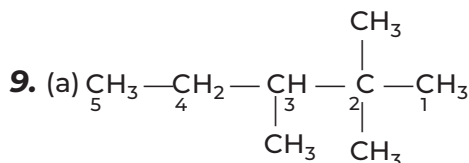
	A	B	C	D
(b)	2	4	3	1
(d)	2	1	4	3

**OMR SHEET**

<b>1</b>	(a)	(b)	(c)	(d)	<b>2</b>	(a)	(b)	(c)	(d)	<b>3</b>	(a)	(b)	(c)	(d)	<b>4</b>	(a)	(b)	(c)	(d)
<b>5</b>	(a)	(b)	(c)	(d)	<b>6</b>	(a)	(b)	(c)	(d)	<b>7</b>	(a)	(b)	(c)	(d)	<b>8</b>	(a)	(b)	(c)	(d)
<b>9</b>	(a)	(b)	(c)	(d)	<b>10</b>	(a)	(b)	(c)	(d)	<b>11</b>	(a)	(b)	(c)	(d)	<b>12</b>	(a)	(b)	(c)	(d)
<b>13</b>	(a)	(b)	(c)	(d)	<b>14</b>	(a)	(b)	(c)	(d)	<b>15</b>	(a)	(b)	(c)	(d)	<b>16</b>	(a)	(b)	(c)	(d)
<b>17</b>	(a)	(b)	(c)	(d)	<b>18</b>	(a)	(b)	(c)	(d)	<b>19</b>	(a)	(b)	(c)	(d)	<b>20</b>	(a)	(b)	(c)	(d)
<b>21</b>	(a)	(b)	(c)	(d)	<b>22</b>	(a)	(b)	(c)	(d)	<b>23</b>	(a)	(b)	(c)	(d)	<b>24</b>	(a)	(b)	(c)	(d)
<b>25</b>	(a)	(b)	(c)	(d)	<b>26</b>	(a)	(b)	(c)	(d)	<b>27</b>	(a)	(b)	(c)	(d)	<b>28</b>	(a)	(b)	(c)	(d)
<b>29</b>	(a)	(b)	(c)	(d)	<b>30</b>	(a)	(b)	(c)	(d)	<b>31</b>	(a)	(b)	(c)	(d)	<b>32</b>	(a)	(b)	(c)	(d)
<b>33</b>	(a)	(b)	(c)	(d)	<b>34</b>	(a)	(b)	(c)	(d)	<b>35</b>	(a)	(b)	(c)	(d)	<b>36</b>	(a)	(b)	(c)	(d)
<b>37</b>	(a)	(b)	(c)	(d)	<b>38</b>	(a)	(b)	(c)	(d)	<b>39</b>	(a)	(b)	(c)	(d)	<b>40</b>	(a)	(b)	(c)	(d)
<b>41</b>	(a)	(b)	(c)	(d)	<b>42</b>	(a)	(b)	(c)	(d)	<b>43</b>	(a)	(b)	(c)	(d)	<b>44</b>	(a)	(b)	(c)	(d)
<b>45</b>	(a)	(b)	(c)	(d)	<b>46</b>	(a)	(b)	(c)	(d)	<b>47</b>	(a)	(b)	(c)	(d)	<b>48</b>	(a)	(b)	(c)	(d)
<b>49</b>	(a)	(b)	(c)	(d)	<b>50</b>	(a)	(b)	(c)	(d)										

## Answers with Hints

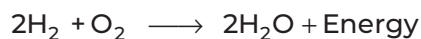
- (d) The given figure is of seed which contains future plant (embryo) in it. The following parts are A–Radicle (develop into future root), B–Plumule (develop into future shoot), C–Cotyledon (store food for the developing embryo).
- (c) *Aqua-regia* consists of 3 parts of conc. HCl and 1 part of conc. HNO<sub>3</sub>. It is used in etching and in specific analytic procedure. It is also used in some laboratories to clean glass ware of organic compounds and metal particles.
- (d) According to the right hand's thumb rule, the magnetic field produced due to a circular wire carrying current is perpendicular to the plane of the wire at its centre.
- (d) The most electropositive element is Li and the most electronegative element is F in second period.
- (a) In the given figure, X–Cross fertilisation, Y–Self-fertilisation.  
Phenotypic ratio = 3 : 1 (3 coloured, 1 white colour flower).
- (c) When direct current flows through a copper rod as it contains charges flowing both inside and outside so magnetic field will also be produced both inside and outside the rod.
- (d) Given reaction is a combination reaction as well as oxidation reaction. Oxidation reactions are those reactions in which addition of oxygen takes place. A combination reaction, where two or more elements or compounds combined together to form a single compound.
- (a) Homologous organs are those organs which have similar structure, but different functions, e.g. Forelimbs of a man and a lizard. The forelimb of a lizard are used for crawling whereas, the forelimb of a man are used for eating, writing and doing various other activities.



2, 2, 3-trimethylpentane

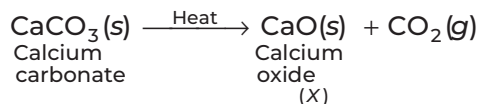
- (d) Disposable plastics plates should not be used as they are made up of non-biodegradable material. They cause many problems like choking of sewage and if they are burned they produce harmful gas.
- (c) The direction of force which acts on a current carrying conductor placed in a magnetic field is given by Fleming's left hand rule. It states that, if the forefinger, thumb and middle finger of left hand are stretched mutually perpendicular and the forefinger points along the direction of external magnetic field, middle finger indicates the direction of current, then thumb points in the direction of force acting on the conductor.  
Hence, *R* shows the direction of current.
- (a) Hydrochloric acid is a mineral acid and ionised completely in water, that's why it is a strong acid. Acetic acid is an organic acid and ionised only partially in water. Hence, it is a weak acid. Water has somewhat neutral nature. Thus, the order of acidity is  
Water < acetic acid < hydrochloric acid.

- 13.** (d) Frog is a secondary consumer and snake is a tertiary consumer, hence, energy transfer will be from secondary consumer to tertiary consumer.
- 14.** (b) In parallel connection, the equivalent resistance of the circuit decreases. So, the load on the power supply decreases.
- 15.** (c) Hydrogen gas ( $H_2$ ) reacts with oxygen gas ( $O_2$ ) to give water vapours ( $H_2O$ ).



- 16.** (b) Charles Elton gave the concept of ecological pyramid in 1927. Ecological pyramid is a graphical representation that shows the biomass at each trophic level.
- 17.** (c) Persistence of vision is the retention of a visual image for a short period of time after the object has disappeared from view. This principle is used in cinematography for making motion picture.
- 18.** (b) All metal oxides do not react with water to give salt and acid. Some metal oxides (like  $Na_2O$ ,  $CaO$ , etc.) react with water to form metal hydroxides (bases) only.
- 19.** (c) Sulphur dioxide ( $SO_2$ ) caused damage to the Taj Mahal, creating acidic affect over the building, as a result the marble of Taj Mahal now appear yellowish.
- 20.** (a) The element with atomic number 7 has 5 electrons in its outermost shell, hence, it is a non-metal and will form an acidic oxide. Rest all metals form basic oxide.
- 21.** (c) When a patient is suffering from renal failure then the blood urea level will rises abnormally which leads to uremia. Hence, to remove excess urea from blood, haemodialysis is done.
- 22.** (b) Here statement I is correct, but statement II is incorrect's, which can be corrected as : Image formed by plane mirror is virtual, erect and same as object's size.
- 23.** (d) Mendeleev predicted the existence of two elements. Eka-silicon was replaced by Ge (Germanium) and Eka-aluminium was replaced by Ga (Gallium).
- 24.** (c) Gastric juice contains enzymes like pepsin; saliva contain amylase which digest carbohydrate; pancreatic juice contain enzymes-trypsin, lipase, etc. but bile juice do not contain any enzyme it contains salt like sodium bicarbonate.
- 25.** (c) According to Mendeleev's periodic law, the elements were arranged in the periodic table in the order of increasing atomic masses.
- 26.** (b) Peripheral nervous system consists of 12 pair of cranial nerves originating from brain and 31 pair of spinal nerves which originates from spinal cord.
- 27.** (a) Ag does not displace hydrogen from acids since it is below hydrogen in the reactivity series.
- 28.** (d) Auxin, gibberellin and cytokinin are growth promoting hormones, while abscisic acid is growth inhibiting hormone.
- 29.** (a) Phloem tissue consist of sieve tube, companion cells, phloem fibre and phloem parenchyma. Tracheids are present in xylem.
- 30.** (a) The magnification of the image formed by a plane mirror is 1 because size of the image is equals to the size of the object.

31. (b) When calcium carbonate is heated, it decomposes and form calcium oxide (X) and CO<sub>2</sub>.



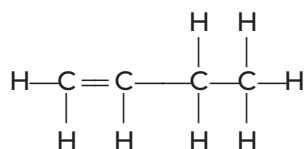
32. (a) Statement I is correct but II is incorrect, because in self-pollination, pollination occur in same plant, therefore, geographical isolation cannot be a major factor in speciation because no new trait can become a part of the genetic makeup in a self pollinating plant species.

33. (a) Since, power is positive, it signifies convex lens.

$$\therefore \text{Power, } P = \frac{1}{f}$$

$$\Rightarrow f = \frac{1}{P} = \frac{1}{2.5} = 0.4 \text{ m} = 40 \text{ cm}$$

34. (b) The molecular formula of butene is C<sub>4</sub>H<sub>8</sub>. The structural formula of butene is



Butene

Thus, 2-methylpropene and butene are isomers, because they have the same molecular formula but different structural formulae.

35. (b) Statement II is correct because the presence of coliform bacteria in river water indicate presence of (disease causing) pathogen in water.

36. (b) *Archaeopteryx* is the connecting link between reptiles and birds as it posses the features of both reptiles and birds.

37. (d) The refractive index for given materials are

$$\mu_{\text{water}} = 1.33$$

$$\mu_{\text{mustard oil}} = 1.47$$

$$\mu_{\text{glycerine}} = 1.473$$

$$\mu_{\text{kerosene}} = 1.44$$

Since, glycerine has highest refractive index, so the ray bends most in this case.

38. (b) Metals which are less reactive than hydrogen, i.e. placed below hydrogen in the reactivity series, are obtained by the reduction of their oxides with hydrogen. Thus, copper and silver among all the given metals can be obtained by the reduction of their oxides with hydrogen.

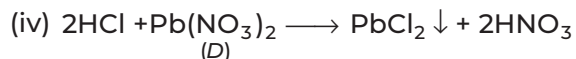
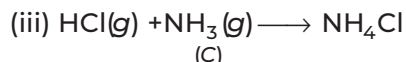
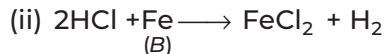
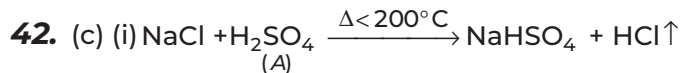
39. (d) To obtain smaller inverted image from convex lens, the object should be placed beyond 2F, i.e. greater than 100 cm. So, the object should be placed at 105 cm.

40. (a) X–The organisms which can reproduce *via* regeneration or budding is *Hydra*.

Y–The organisms which reproduce only by the process of budding in yeast.

41. (b) The given figure is of *Rhizopus*, which reproduce by spore formation.

Y–The structure at the stalk is called sporangia inside it large amount of spores are formed, under favourable condition they germinate into new individual and under unfavourable condition they get damaged.



43. (a) Here, object distance,  $u = -60$  cm

Image distance,  $v = -10$  cm

Using lens formula,

$$\begin{aligned} \frac{1}{f} &= \frac{1}{v} - \frac{1}{u} \\ &= \frac{1}{(-10)} - \frac{1}{(-60)} = \frac{-6 + 1}{60} = \frac{-5}{60} = -\frac{1}{12} \end{aligned}$$

or  $f = -12$  cm

Power of lens,  $P = \frac{100}{f} = -\frac{100}{12} = -8.3$  D

44. (d) X–Vaginal pills is the chemical method of birth control. These pills contain chemicals called spermicides which kills the sperms.

Y–Condom is the barrier method of birth control. It is an ideal contraceptive and an important benefit of condom is that it protect a person from STD's (sexually transmitted disease).

Z–Copper-T is one of the invasive method which is implanted by a doctor or a trained nurse in vagina of female. Copper ions present in them supresses the sperm due to which fertilisation does not take place.

45. (c) When  $n$  equal resistances are connected in series, their equivalent resistance is maximum and given by

$$\begin{aligned} R_s &= R + R + \dots + n \text{ times} \\ &= nR \end{aligned}$$

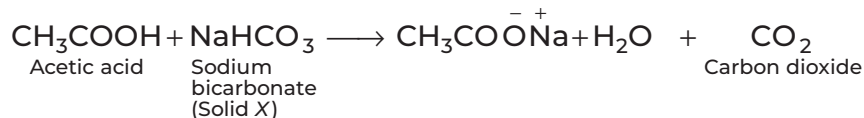
When these are connected in parallel combination, then equivalent resistance will be minimum and given by

$$\begin{aligned} \frac{1}{R_p} &= \frac{1}{R} + \frac{1}{R} + \dots n \text{ times} \\ &= \frac{n}{R} \end{aligned}$$

$$\Rightarrow R_p = \frac{R}{n}$$

$$\therefore \frac{R_s}{R_p} = \frac{nR}{R/n} = n^2$$

46. (b) Solid 'X' is sodium bicarbonate ( $\text{NaHCO}_3$ ).



$\text{CO}_2$  is a colourless and odourless gas which turns milk when passed through lime water.

47. (c) The resistance of a wire is given by

$$R = \rho \frac{L}{A}$$

$$\Rightarrow R \propto \frac{L}{A} \text{ or } R \propto \frac{L}{D^2} \quad \left( \because A = \pi \frac{D^2}{4} \right)$$

So, the value of resistance will be minimum for the wire having smallest length and largest diameter. This condition is satisfied by option (c).

48. (b) A–Pulmonary vein carry oxygenated blood from lungs to heart.

B–Aorta is the artery which carry oxygenated blood to all parts of body.

C–Vena cava carry deoxygenated blood from body to heart.

D–Pulmonary artery carry deoxygenated blood from heart to lungs.

49. (a) Metal rod (M) is Zn.

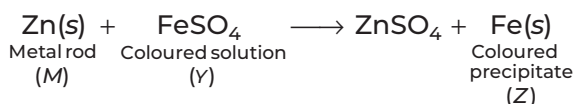
Coloured solution (Y) is  $\text{FeSO}_4$ .

Coloured precipitate (Z) is Fe.

According to chemical reactivity series,

More reactive metal displaced less reactive metal from their solution.

Zn is more reactive metal among all of these and when Zn is dipped in  $\text{FeSO}_4$  solution then Fe is displaced from  $\text{FeSO}_4$  solution.



50. (d) The right match for the given columns is

Presbyopia	Hypermetropia (or Myopia)
Retina	Real image
Astigmatism	Cylindrical lenses
Accomodation	Ciliary muscles