

Jawahar Navodaya Vidyalaya Entrance Exam, Class-9 SOLVED PAPER-2023

Exam Date: 11 February 2023

Section-I: हिन्दी

निर्देश : (प्रश्न सं. 1 से 15 तक) : प्रत्येक प्रश्न के लिए चार सम्भावित उत्तर विकल्प दिए गए हैं, जिनमें से केवल एक सही है। सही उत्तर चुनकर उसको ओ.एम.आर. उत्तर-पत्रिका पर उपयुक्त स्थान पर दर्शाना है।

1. शुद्ध वर्तनी वाला शब्द छाँटिए-

- (a) आविस्कार (b) आविश्कार
(c) अविष्कार (d) आविष्कार

2. किस विकल्प में दोनों शब्द तत्सम हैं ?

- (a) सूरज, अग्नि (b) भानु, आसमान
(c) आकाश, सितारा (d) दिनकर, सूर्य

3. उस विकल्प का चयन कीजिए जिसमें दोनों शब्द 'बादल' के पर्यायवाची हैं-

- (a) मेघ, गगन (b) शैल, व्योम
(c) नभ, नग (d) घन, जलद

4. निम्नलिखित वाक्य में रिक्त स्थान के लिए उपयुक्त शब्द चुनिए।

बैंक से लिया है तो चुकाना भी पड़ेगा।

- (a) उदार (b) उधार
(c) उद्धार (d) उधर

5. संज्ञा की विशेषता बताने वाले शब्द को कहा जाता है-

- (a) सर्वनाम (b) विशेष्य
(c) विशेषण (d) क्रिया विशेषण

निर्देश: निम्नलिखित अनुच्छेद को पढ़कर प्रश्न 6 से 10 तक के लिए सर्वाधिक उपयुक्त उत्तर चुनिए।

आज हमारे अस्तित्व के लिए सबसे बड़ी चुनौती है- प्रदूषण। साँस लेते हुए भोजन के साथ या पीने वाले पानी के साथ अत्यंत विषैले पदार्थ हमारे शरीर में पहुँच रहे हैं, वन काट देने से वर्षा अनियमित हो रही है- कहीं बाढ़, कहीं सूखा। तापमान बढ़ने से ग्लेशियर पिघल रहे हैं और समुद्रों में जल स्तर बढ़ रहा है। इसलिए संभव है सदी के अंत तक ग्लेशियर से निकलने वाली गंगा-यमुना जैसी नदियाँ ही सूख जाएँ। इसीलिए कहा जाता है कि अगला विश्वयुद्ध पानी के लिए होगा। प्रदूषण से अनेक प्रकार के असाध्य रोग बढ़ रहे हैं। वन कट रहे हैं और वनस्पतियाँ उजड़ रही हैं। वन्य जीव-जन्तुओं पर खतरा मंडरा रहा है और अंततः यह खतरा पूरे मानव समाज के लिए विनाशक होगा। मानव जाति को इस पृथ्वी से विलुप्त होने से रोकना है, तो हमें जैसे भी हो प्रदूषण को शीघ्र ही रोकना होगा। अन्यथा कभी दूसरे ग्रह से आने वाले प्राणी पृथ्वी पर पहुँचकर कहेंगे- यहाँ कभी मनुष्य रहता था जो इतना मूर्ख था कि अपने पैरों पर स्वयं कुल्हाड़ी मारकर उजड़ गया।

6. वन्य जीव-जन्तुओं के अस्तित्व पर खतरा होने का कारण है-

- (a) वनों का कटना
(b) ग्लेशियर का पिघलना
(c) नदियों का सूखना
(d) समुद्रों में जल स्तर बढ़ना

7. कैसे कह सकते हैं कि गंगा-यमुना जैसी नदियाँ कभी सूख सकती हैं ?

- (a) वन कट रहे हैं
(b) बाढ़ें आ रही हैं
(c) ग्लेशियर पिघल रहे हैं
(d) समुद्रों का जल स्तर बढ़ रहा है

8. जिन रोगों की चिकित्सा असंभव हो, उन्हें कहा जाता है-

- (a) विनाशक (b) असाध्य
(c) असंभव (d) विलुप्त

9. हमारे शरीर में अत्यंत विषैले पदार्थ किसके द्वारा पहुँच रहे हैं ?

- (a) हमारे अस्तित्व के द्वारा
(b) हवा, जल और भोजन के द्वारा
(c) गंगा-यमुना के जल के द्वारा
(d) वन्य जीव-जन्तुओं के द्वारा

10. अनुच्छेद में आए किस शब्द का अर्थ 'संकट' है ?

- (a) विनाशक (b) अन्यथा
(c) खतरा (d) प्रदूषण

11. शुद्ध वाक्य छाँटिए।

- (a) हम तो पहले ही बता दिए थे।
(b) हम तो पहले ही बताए थे।
(c) हमने तो पहले ही बता ही दिए थे।
(d) हमने तो पहले ही बता दिया था।

12. वह शब्द पहचानिए जिसमें कोई उपसर्ग नहीं है-

- (a) नियम (b) निबंध
(c) नित्य (d) निर्वाचन

13. "रिया दूध पीकर सोने चली गई।"

उपर्युक्त वाक्य का संयुक्त वाक्य होगा-

- (a) रिया ने सोने से पहले दूध पिया।
(b) रिया ने दूध पिया और सोने चली गई।
(c) जब रिया ने दूध पी लिया तो सोने चली गई।
(d) रिया, दूध पियो और सो जाओ।



14. निम्नलिखित वाक्य के लिए उपयुक्त मुहावरा चुनिए-
कितना समझाया था, पर इसके ।
- (a) दाल नहीं गली (b) कान पर जूँ तक नहीं रेंगी
(c) कान नहीं भरे (d) कान फूट गए
15. किसी का नाम बड़ा हो पर उसमें उतने गुण न हो तो किस लोकोक्ति का प्रयोग ठीक रहेगा ?
- (a) अंशों में काना राजा (b) मुँह में राम बगल में छुरी
(c) कैंची दुकान फीके पकवान (d) अधजल गगरी छलकत जाए

Section-II: ENGLISH

Directions: (Questions no. 16 to 30) : For each question, four possible answer choices have been given, out of which only one is correct. Select the correct answer and indicate it at the appropriate place in the OMR Answer Sheet.

Directions: Read the following passage carefully and answer questions no. 16-18.

We turned to look in the direction pointed out, and there saw a penguin walking slowly along the shore with an egg under its tail. There were several others, we observed doing the same thing; and we found afterwards that these were a kind of penguins that always carried their eggs. Indeed they had a most useful pocket for the purpose, just between the tail and the legs. We were very much struck with the regularity and order of this colony. The island seemed to be divided up into squares of which penguin possessed one, and sat in stiff graveness in the middle of it, or took a slow march up and down the spare in between. Some were sitting on their eggs, but others were feeding their young ones in a manner that caused us to laugh a little. The mother stood on a raised rock, while the young one below her head uttered a number of loud unpleasant noises.

16. **The penguins carried their eggs in a pocket**
- (a) under their wings.
(b) between the tail and legs.
(c) on their backs.
(d) on their tails.
17. **The narrator and his friend could not help laughing when they saw**
- (a) the penguins carry their eggs
(b) the penguins do a slow march
(c) the mother penguins feeding their young ones
(d) a mother penguin standing on a raised rock and the young one making a loud noise below her.
18. **The penguins live**
- (a) on rocks (b) in squares
(c) on an island (d) in a colony

Directions: Answer questions no. 19-22 by choosing the most appropriate options to complete the paragraph by filling in the blanks.

Udhata, a thin donkey who was starved by his owner, a local fisherman. He went in search (19) food with his friend, a jackal. The pair went (20) the village in the middle of the night until they stumbled upon a cucumber field. That night, they truly relished

their meal and decided to pay a visit to the cucumber field every night. Udhata eventually (21) to look much healthier and was able to pick up more load. Once after appetizing a wholesome meal (22) cucumbers, the donkey started braying.

19. (a) out (b) of
(c) into (d) on
20. (a) around (b) out
(c) for (d) onto
21. (a) begin (b) beginning
(c) began (d) begun
22. (a) on (b) for
(c) into (d) of
23. **Choose the word similar in meaning to the underlined word.**
After a long and arduous drive on the hills, he felt fatigued.
(a) easily (b) effortless
(c) difficult (d) enjoyable
24. **Read the sentence given below and choose the option which correctly changes it into Passive Voice.**
She created twenty new dresses for the fashion show in just two days.
(a) She had created twenty new dresses for the fashion show in just two days.
(b) Twenty new dresses were created by her for the fashion show in just two days.
(c) She had been creating twenty new dresses for the fashion show in just two days.
(d) She will be creating twenty new dresses for the fashion show in just two days.
25. **The candidate said that his views have been deliberately garbled. The word opposite in meaning to the underlined one is :**
(a) clarified (b) slanted
(c) distorted (d) illustrated

Directions (Questions No. 26-28) : Answer the questions by choosing the most appropriate options to fill in the blanks.

26. **No other boy in the class is as as Ram.**
(a) better (b) good
(c) bent (d) worse
27. **He was sleeping well when the bell**
(a) has rung (a) rang
(c) is ringing (d) would ring
28. **You can't depend on him, he knows about finance.**
(a) a little (b) few
(c) little (d) much
29. **Choose one-word substitute for the following expression :**
Something that cure all illnesses or prolongs life.
(a) Elixir (a) Idyllic
(c) Massif (d) Masterpiece

30. Select the alternative which expresses the following sentence in indirect speech :

The manager said to the clerk, "You may leave now. Don't forget to keep these files in the file cabinet."

- (a) The manager says to the clerk that you may leave then and asked not to forget to keep these files in the cabinet.
- (b) The manager told the clerk that he might leave then and ordered him not to forget to keep those files in the file cabinet.
- (c) The manager said to the clerk that he may leave now and ordered not to forget to keep those files in the cabinet.
- (d) The manager told to the clerk that he might leave then and ordered not to forget to keep these files in the cabinet.

Section-III: MATHEMATICS

Directions: (Questions no. 31 to 65) For each question, four possible answer choices have been given, out of which only one is correct. Select the correct answer and indicate it at the appropriate place in the OMR Answer Sheet.

31. If the price of an item is increased by 15% and the total sales of that item is reduced by 10%, then what will be the effect on the total earning of a shopkeeper?
- (a) 5% decrease
 - (b) 1.5% increase
 - (c) 2.5% decrease
 - (d) 3.5% increase
32. A sum of money invested at simple interest triples itself in 8 years. How many times will it become in 20 years' time?
- (a) 8
 - (b) 7
 - (c) 6
 - (d) 9
33. At the rate of 5% annual interest on a sum of money, ₹ 1,261 compound interest is received in 3 years. The sum of money invested is :
- (a) ₹ 9,000
 - (b) ₹ 8,400
 - (c) ₹ 8,000
 - (d) ₹ 7,500
34. A can do a work in 25 days and B can finish it in 20 days. They work together for 5 days. In how many days will B finish the remaining work?
- (a) 8 days
 - (b) 10 days
 - (c) 11 days
 - (d) 13 days
35. If 5 men or 7 women can earn ₹1,372 per day, how much would 10 men and 5 women earn per day?
- (a) ₹3,724
 - (b) ₹3,624
 - (c) ₹3,524
 - (d) ₹3,124
36. ABCD is a square. P, Q, R, S are the mid-points of AB, BC, CD and DA respectively. If the perimeter of square ABCD is $16\sqrt{2}$ cm, then the perimeter of the square PQRS is :
- (a) $16\sqrt{2}$ cm
 - (b) $8\sqrt{2}$ cm
 - (c) 8 cm
 - (d) 16 cm
37. The perimeters of two squares are 40 cm and 32 cm. What is the perimeter of the third square whose area is equal to the difference of the areas of the first two squares?
- (a) 24 cm
 - (b) 26 cm
 - (c) 25 cm
 - (d) 28 cm
38. A total of ₹50,000 is to be distributed as prizes to 200 persons. A prize is either of ₹100 or ₹500. What is the number of prizes of ₹100?
- (a) 50
 - (b) 75
 - (c) 125
 - (d) 150
39. ABCD is a parallelogram having its sides, $AB = 3x + 1$, $BC = 2y + 3$, $CD = 25$ and $DA = y + 28$. Then, $(x + y)$ is equal to :
- (a) 29
 - (b) 21
 - (c) 25
 - (d) 33
40. The four angles of a quadrilateral are in the ratio 2 : 3 : 5 : 8. What is the difference between the smallest and the greatest angles of the quadrilateral?
- (a) 80°
 - (b) 100°
 - (c) 110°
 - (d) 120°
41. If $a^2 + b^2 + c^2 = 2(a - b - c) - 3$, then the value of $(2a - 3b + 4c)$ is:
- (a) 4
 - (b) 3
 - (c) 2
 - (d) 1
42. The ages of Raju and Raman are in the ratio 5 : 8. If Raju was 5 years older and Raman 4 years younger, the age of Raju would have been the same as that of Raman. What is the age of Raju?
- (a) 15 years
 - (b) 16 years
 - (c) 24 years
 - (d) 13 years
43. The difference between the digits of a 2-digit number is 3. If the digits are interchanged and the resulting number is added to the original number, we get 143. What is the original number?
- (a) 58
 - (b) 47
 - (c) 69
 - (d) 96
44. If $\left(x - \frac{1}{x}\right)^2 = 36$, then what is the value of $x^4 + \frac{1}{x^4}$?
- (a) 1442
 - (b) 1440
 - (c) 1444
 - (d) 1438
45. If one of the factors of $x^2 - y^2 + 2yz - z^2$ is $(x + y - z)$, then the other factor is:

- (a) $x + y - z$
 (b) $x - y + z$
 (c) $x + y + z$
 (d) $x - y - z$
46. The smallest square number which is divisible by each of the numbers 8, 15 and 20 is :
 (a) 900 (b) 1600
 (c) 2500 (d) 3600
47. If $1^3 + 2^3 + 3^3 + 4^3 + 5^3 = 225$, then $2^3 + 4^3 + 6^3 + 8^3 + 10^3$ is equal to :
 (a) 450 (b) 900
 (c) 1800 (d) $(225)^2$
48. $\sqrt[3]{0.008} + \sqrt[3]{0.343} - \sqrt{0.25}$ is equal to :
 (a) 0.4 (b) 0.5
 (c) 0.7 (d) 0.8
49. $\sqrt{\frac{9}{16}} + (0.008)^{\frac{2}{3}} - \left(\frac{7}{10}\right)^0$ is equal to :
 (a) $11\frac{2}{3}$ (b) $24\frac{3}{4}$
 (c) $18\frac{1}{3}$ (d) $15\frac{2}{3}$
50. The greatest 4-digit number which is a perfect square, is:
 (a) 9801 (b) 9816
 (c) 9824 (d) 9864
51. Which of the following is a Pythagorean triplet?
 (a) (2, 3, 5)
 (b) (5, 7, 9)
 (c) (6, 9, 11)
 (d) (8, 15, 17)
52. The area of a square field is 60025 sq. m. A boy cycles along its boundary at 18 km/h. In how much time will he return to the starting point?
 (a) 166 seconds (b) 176 seconds
 (c) 196 seconds (d) 208 seconds
53. The unit place digit in 9^{201} is:
 (a) 9 (b) 7
 (c) 3 (d) 1
54. Four prime numbers are in ascending order. The product of the first three numbers is 455 and the product of the last three numbers is 1729. The greatest prime number amongst these four numbers is:
 (a) 7 (c) 19
 (b) 13 (d) 23
55. The smallest number which when added to the greatest 4-digit number makes the divisible by 345 is:
 (a) 5 (b) 6
 (c) 50 (d) 60
56. How many bricks of size 22 cm \times 10 cm \times 7 cm are required to construct a wall 33 m long, 3.5 m high and 40 cm thick if sand used in the construction occupies $\frac{1}{10}$ th part of the wall?
 (a) 24,000
 (b) 25,000
 (c) 26,000
 (d) 27,000
57. An 8-faced fair die with numbers 1 to 8 is rolled. What is the probability of getting an even number?
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
 (c) $\frac{1}{4}$ (d) $\frac{1}{6}$
58. The ages (in years) of 50 members of the junior cricket club in a town are given below: 15, 17, 14, 13, 14, 13, 14, 17, 17, 16, 17, 16, 15, 16, 15, 14, 13, 14, 15, 13, 18, 13, 15, 14, 15, 13, 14, 13, 13, 17, 15, 14, 14, 17, 16, 17, 15, 14, 17, 16, 16, 14, 16, 13, 18, 16, 15, 14, 14
 What percentage of members are in the 15 - 16 age group?
 (a) 28% (b) 30%
 (c) 32% (d) 36%
59. The area of a rectangular plot is 150 sq m and perimeter is 50 m. The ratio of its length to breadth is :
 (a) 3:2 (b) 50:3
 (c) 6:1 (d) 7:2
60. A swimming pool is 260 m long and 140 m wide. If 54,600 cu m of water is pumped into it, what is the height of the water level in it?
 (a) 1 m
 (b) 1.5 m
 (c) 2 m
 (d) 2.5 m
61. What number should $(23)^{-3}$ be multiplied with so that the product becomes $(69)^{-1}$?
 (a) $\frac{529}{4}$ (b) $\frac{529}{7}$
 (c) $\frac{529}{3}$ (d) $\frac{529}{6}$

62. $(6 + 3) \times 9 - 1 \div 3 - 1 + 2 - 2$ is equal to :

- (a) $\frac{5}{4}$ (b) $\frac{7}{4}$
 (c) $\frac{13}{4}$ (d) $\frac{7}{8}$

63. A pipe can fill a cistern in 9 hours. Due to a leak in its bottom, the cistern fills up in 10 hours. If the cistern is full, in how much time will it be emptied by the leak?

- (a) 60 hours
 (b) 70 hours
 (c) 80 hours
 (d) 90 hours

64. If $2^{2x-1} = \frac{1}{8^{x-3}}$, then the value of x is:

- (a) -2 (b) -1
 (c) 2 (d) 3

65. If $5^{2p} + 5^p + 5^0 = 651$, then the value of p is:

- (a) 2 (b) 3
 (c) 4 (d) 5

(c) (1), (2) and (4)

(d) (1), (2) and (3)

68. Select the correct statement with reference to soil.

- (a) Loamy soil contains sand and clay only.
 (b) In loamy soil the percolation of water is very fast.
 (c) Weathering is a very fast process of soil formation.
 (d) Top soil contains maximum amount of humus.

69. A student has put a drop of dilute solution of sodium hydroxide first on a strip of blue litmus paper and then on a strip of red litmus paper. His observations must be:

- (a) Blue litmus paper turns red and red litmus paper turns blue.
 (b) No change in blue litmus paper but the red litmus paper turns blue.
 (c) Blue litmus paper turns red and no change in the red litmus paper.
 (d) Blue litmus paper and red litmus paper both become colourless.

70. Consider the following components of a food chain: Frog, Eagle, Insects, Grass, Snake

In the food chain, the correct order of these components is

- (a) Grass → Insects → Snake → Frog → Eagle
 (b) Grass → Frog → Insects → Snake → Eagle
 (c) Grass → Insects → Frog → Eagle → Snake
 (d) Grass → Insects → Frog → Snake → Eagle

71. Select the correct statement from the following:

- (a) Cotton and Mustard both are Kharif crops.
 (b) Cotton and Mustard both are Rabi crops.
 (c) Cotton is a Kharif crop and Mustard is a Rabi crop.
 (d) Cotton is a Rabi crop and Mustard is a Kharif crop.

72. Consider the following agricultural practices/processes:

- (1) Ploughing
 (2) Crop Rotation
 (3) Field Fallow
 (4) Adding Manure and Fertiliser

The practices/processes which add nutrition to the soil are:

- (a) Only (2) and (4)
 (b) (1), (3) and (4)
 (c) (1), (2) and (4)
 (d) (2), (3) and (4)

73. Select from the following a group that comprises one element, one compound and one mixture :

- (a) Gold, sulphuric acid, air
 (b) Silver, carbon dioxide, sodium chloride
 (c) Oxygen, soil, milk
 (d) Silver, methane, manganese dioxide

Section-IV: GENERAL SCIENCE

Directions : (Questions no. 66 to 100) For each question, four possible answer choices have been given, out of which only one is correct. Select the correct answer and indicate it at the appropriate place in the OMR Answer Sheet.

66. Consider the following statements about chemical reactions:

- (1) During reaction sound may be produced.
 (2) During reaction heat may be produced but never absorbed.
 (3) During reaction a gas is always evolved.
 (4) The products formed may have different colour or physical state than the reactants.

The correct statement(s) is/are:

- (a) Only (4)
 (b) Only (1) and (4)
 (c) (1), (2) and (4)
 (d) (2), (3) and (4)

67. Consider the following adaptive features of animals :

- (1) Thick white fur
 (2) Layer of fat under the skin
 (3) Slippery body
 (4) Long curved and sharp claws

Out of these the adaptive features of a polar bear are:

- (a) Only (1) and (2)
 (b) Only (3) and (4)

74. An optical device (mirror or lens) can form real diminished as well as real enlarged images of an object on a screen placed on the same side as the object. This optical device is:

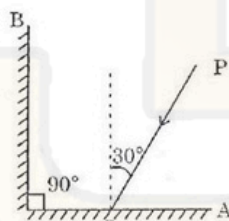
- (a) convex lens only
- (b) concave mirror only
- (c) either convex lens or concave mirror
- (d) either convex mirror or convex lens

75. According to the recommendations of the United Nations, the amount of water for drinking, washing, cooking and maintaining proper hygiene per person per day is a minimum of:

- (a) 100 litres
- (b) 50 litres
- (c) 25 litres
- (d) 20 litres

76. Two plane mirrors 'A' and 'B' are placed at right angles to each other as shown. A ray of light PO incident at point O on the mirror 'A' at an angle of 30° falls on the mirror 'B' after reflection from the mirror 'A'. The angle of reflection for the ray reflected from the mirror B would be:

Figure



- (a) 30°
- (b) 60°
- (c) 120°
- (d) 150°

77. The correct sequence of three planets of the solar system in increasing order of their distance from the Sun is :

- (a) Venus, Mars, Saturn
- (b) Mercury, Venus, Mars
- (c) Mars, Mercury, Jupiter
- (d) Venus, Earth, Mars

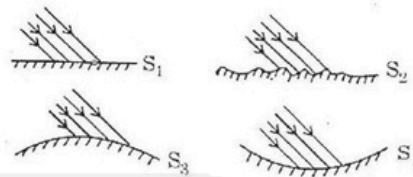
78. A planet of our solar system which has no satellite of its own is:

- (a) Mars
- (b) Neptune
- (c) Uranus
- (d) Venus

79. Richter scale is used to measure the intensity of:

- (a) Lightning
- (b) Earthquake
- (c) Tsunami
- (d) Landslide

80. Four parallel rays of light are falling on surfaces S_1 , S_2 , S_3 and S_4 as shown in the figure. Surface(s) on which the angle of incidence is equal to angle of reflection is/are:



81. The method used to obtain solid copper sulphate from copper sulphate solution is:

- (a) Condensation
- (b) Decantation
- (c) Evaporation
- (d) Sedimentation

82. The combination of features observed in grass is :

- (a) tap root and reticulate venation
- (b) fibrous root and parallel venation
- (c) tap root and parallel venation
- (d) fibrous root and reticulate venation

83. The mode of nutrition used by bread mould, mushroom and yeast is:

- (a) saprophytic
- (b) parasitic
- (c) heterotrophic
- (d) autotrophic

84. Human digestive system has more than ten organs. Select from the following combinations of three organs the one that does not carry out any of the digestive functions.

- (a) Buccal cavity, Oesophagus, Large intestine
- (b) Buccal cavity, Oesophagus, Rectum
- (c) Oesophagus, Large intestine, Rectum
- (d) Oesophagus, Pancreas, Small intestine

85. Consider the following edible plants:

- (1) Brinjal
- (2) Banana
- (3) Ladyfinger
- (4) Pumpkin

Out of these, a pair of plants having two or more edible parts is:

- (a) (1) and (2)
- (b) (3) and (4)
- (c) (2) and (4)
- (d) (1) and (3)

86. The fastest speed of falcon is 320 kilometres per hour. The correct method of expressing this speed using the correct unit symbols of distance and time is:

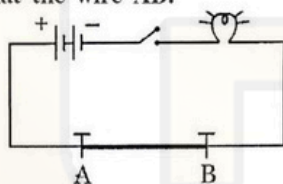
- (a) 320 kms/hr
- (b) 320 KM/H
- (c) 320 KMS/HR
- (d) 320 km/h

87. A bus moves with a speed of 36 kilometres per hour for 20 minutes and then with a speed of the next 54

kilometres per hour for the 20 minutes. The total distance covered by the bus is:

- (a) 12 kilometres
- (b) 18 kilometres
- (c) 30 kilometres
- (d) 45 kilometres

88. Consider the electric circuit as shown. In this, AB is a thick copper wire. When the switch is ON current flows through the wire AB and the bulb starts glowing. We observe that the wire AB:



- (a) becomes red hot.
- (b) behaves like an electric fuse and melts immediately.
- (c) gives a severe shock on touching.
- (d) deflects a compass needle placed near it.

89. Sometimes the athletes suffer from muscle, cramps. It is due to anaerobic respiration in which glucose is converted to:

- (a) lactic acid only
- (b) lactic acid and carbon dioxide
- (c) alcohol and carbon dioxide
- (d) alcohol and lactic acid

90. In human bodies the exchange of gases between blood and tissue and the absorption of nutrients takes place in the :

- (a) heart
- (b) capillaries
- (c) arteries
- (d) veins

91. Bryophyllum can reproduce by its :

- (a) Leaves
- (b) Flowers
- (c) Roots
- (d) Stem

92. Besides sunlight, plants also need following for photosynthesis:

- (a) Carbon monoxide, Water, Chlorophyll
- (b) Oxygen, Water, Chlorophyll
- (c) Nitrogen, Chlorophyll, Carbon dioxide
- (d) Chlorophyll, Water, Carbon dioxide

93. Silkworms secrete fibre which is made of:

- (a) protein
- (b) carbohydrates
- (c) cellulose only
- (d) starch + cellulose

94. A copper plate would feel cold as compared to a wooden table on a winter morning. It is due to the reason that the copper plate:

- (a) reflects more heat than the wooden table.
- (b) is made from metal whose density is more than that of wood.
- (c) is a better conductor of heat as compared to the wooden table.
- (d) is a poor conductor of heat as compared to the wooden table.

95. Consider the following statements:

- (1) Excretion takes place in plants.
- (2) Excretion takes place in both plants and animals.
- (3) Excretion is a process of getting rid of excess water only.
- (4) Secretion is one of the methods of excretion.

The correct statements are:

- (a) Only (1) and (2)
- (b) Only (3) and (4)
- (c) (1), (2) and (4)
- (d) (1), (2) and (3)

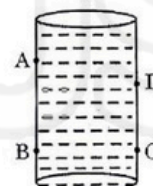
96. Transpiration is a process in which plants:

- (a) absorb water vapours from the atmospheric air.
- (b) release water vapours in the atmosphere.
- (c) receive water from the soil through roots.
- (d) receive water from the atmosphere for photosynthesis.

97. Select a pair of contact forces from the following:

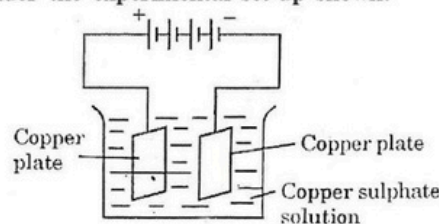
- (a) Muscular force and Magnetic force
- (b) Muscular force and Frictional force.
- (c) Frictional force and Electrostatic force
- (d) Gravitational force and Magnetic force

98. A water tank has four taps A, B, C and D as shown. If the tank is fully filled with water and the taps are opened simultaneously, the water will flow with the same pressure from the taps :



- (a) A and B
- (b) C and D
- (c) B and C
- (d) A and D

99. Consider the experimental set-up shown:



After passing current for about 15 minutes it is observed that:

- the blue colour of the solution fades away.
- both the electrodes gain copper from the solution.
- copper gets transferred from the negatively charged electrode to the positively charged electrode.
- copper gets transferred from the positively charged electrode to the negatively charged electrode.

100. Select from the following a gas where increased concentration in the environment may cause global warming:

- Sulphur dioxide
- Nitrogen dioxide
- Carbon dioxide
- Carbon monoxide

Answers with Explanations

- (d) शुद्ध वर्तनी वाला शब्द है-आविष्कार। अन्य शेष शब्द अशुद्ध हैं। अतः विकल्प (d) सही उत्तर है।
- (d) शुद्ध शब्दों का तत्सम युग है-दिनकर, सूर्य। दोनों ही शब्द तत्सम शब्द हैं।
- (d) घन, जलद बादल के पर्यायवाची हैं। बादल के अन्य पर्यायवाची हैं- नीरद, वारिद, तोयद, अंबुद, मेघ आदि।
- (b) बैंक से उधार लिया है तो चुकाना भी पड़ेगा। अतः विकल्प (b) सही उत्तर है।
- (c) संज्ञा की विशेषता बताने वाले शब्द को विशेषण कहा जाता है। उदाहरण के लिए-सीमा एक सुंदर लड़की है। यहाँ सुंदर शब्द सीमा की विशेषता बता रहा है।
- (a) वन्य जीव-जन्तुओं के अस्तित्व पर खतरा होने का कारण है वनों का कटना। निर्वनीकरण से जीवों के लिए आवासन की समस्या उत्पन्न होती है जो इनके जीवन की संकटपूर्ण चुनौती सिद्ध होती है।
- (c) गंगा-यमुना जैसी नदियाँ इसलिए सूख सकती हैं क्योंकि वृक्षों की कटाई से वर्षा प्रभावित होती है तथा वैश्विक भूतापन होता है। इससे वायुमंडल का तापमान बढ़ेगा और ग्लेशियर जल्दी पिघल जाएंगे जो इन नदियों के मूल स्रोत हैं अतः संभव है कि ये नदियाँ सूख सकती हैं।
- (b) जिन रोगों की चिकित्सा संभव न हो उनको असाध्य रोग कहा जाता है। असाध्य का अर्थ है जिसे साधा (ठीक) ना जा सके।
- (c) हमारे शरीर में विषाक्त पदार्थ हवा, जल और भोजन के द्वारा पहुँच रहे हैं। अत्यंत प्रदूषण के कारण जल, हवा आदि भौतिक तत्वों में प्रदूषण की मात्रा अधिक हो गई है जिसके सेवन से वही प्रदूषण हमारे शरीर तक पहुँच जाता है और हम अनेक बीमारियों का शिकार हो जाते हैं।
- (c) अनुच्छेद में आए शब्द 'खतरा' का अर्थ है 'संकट'। संकट शब्द के अन्य पर्यायवाची हैं- आपत्ति, विपत्ति, विपदा, आपदा, आफत, बला आदि।
- (d) दिए गए वाक्यों में सबसे शुद्ध वाक्य है-हमने तो पहले ही बता दिया था। शेष वाक्यों में अशुद्धियाँ हैं। अतः विकल्प (d) सही उत्तर है।
- (c) नित्य शब्द एकल है। इसमें किसी उपसर्ग का प्रयोग नहीं है। शेष शब्दों में उपसर्ग इस प्रकार हैं- नि + बंध, निर् + वाचन, नि + यम। उपसर्ग वे वर्ण/अक्षर/शब्द होते हैं जो किसी शब्द के आरंभ में लगाए जाते हैं।
- (b) रिया दूध पीकर सोने चली गई। इसका संयुक्त वाक्य होगा- रिया ने दूध पिया और सोने चली गई। संयुक्त वाक्य वे वाक्य हैं जिनमें दो या अधिक वाक्यों को योजक शब्द जैसे-और, परंतु, इसलिए आदि से परस्पर जोड़ा जाता है।
- (b) कितना समझाया था पर इसके कान पर जूँ नहीं रेंगी। कान पर जूँ न रेंगना मुहावरे का अर्थ होता है- कोई फर्क ना पड़ना। शेष विकल्प सही नहीं हैं।
- (c) किसी का नाम बड़ा हो पर उसमें उतने गुण न हों तो इसके लिए मुहावरा है- ऊँची दुकान फीके पकवान। अर्थात् नाम के अनुसार गुणों का ना होना। अन्य मुहावरों का अर्थ-अंधों में काना राजा-मूर्खों में श्रेष्ठ। मुँह में राम बगल में छुड़ी-कथनी और करनी में अंतर होना या कपटी होना। अधजल गगरी छलकत जाए-तुच्छ लोग थोड़े-सा ज्ञान पाकर उतावले हो जाते हैं।
- (b) The penguins carried their eggs in a pocket between the tail and legs. Option (b) is correct answer.
- (c) The narrator and his friend could not help laughing when they saw the mother penguins feeding their young ones. The way of her feeding made them laugh. Option (c) is correct answer.
- (c) Penguins live on Islands. So (c) is the correct answer.
- (b) He went in search of food with his friend, a jackal. Search 'of' is a preposition and used for searching something.
- (c) The pair went for the village in the middle of the night untill they stumbled upon a cucumber field.
- (c) Udhata eventually began to look much healthier and was able to pick more load. 'Began' is correct option as per the passage.
- (d) Once after appetising a wholesome meal of cucumbers, the donkey started braying. 'of' is preposition, a kind of part of speech.
- (c) Here the meaning of underlined word 'arduous' is difficult. Option (c) is correct answer.
- (b) She created twenty new dresses for the fashion show in just two days.
Passive voice of the sentence is :
Twenty new dresses were created by her for the fashion show in just two days.
- (a) The Candidate said that his views have been deliberately garbled. (distorted)
The opposite word of the underlined word 'garbled' is Clarified.

26. (b) No other boy in the class is as good as Ram. Option (b) is correct answer. (as good as, as well as, as soon as etc.)
27. (b) He was sleeping well when the bell rang. (b) is correct answer.
28. (a) You can not depend on him, he knows a little about finance. Option (a) is the correct answer.
29. (a) Something that cure all illnesses or prolongs life is called Elixir. It is a magical or medicinal potion. Idyllic means something extremely pleasant. Massif is a group of mountains and masterpiece means 'a work of outstanding artistry or skill'.
30. (b) (b) is the correct option as per narration rules.
31. (d) Let the initial price of the item = x

$$\therefore \text{increased price} = x + \frac{15}{100} \times x$$

Suppose quantity sold by shopkeeper = y

$$\text{Now total sale} = y - \frac{10 \times y}{100} = 0.9y$$

$$\text{Total earning from sale} = 1.15x \times 0.9y = 1.035xy$$

\therefore Effect on earning

$$= \frac{1.035xy - xy}{xy} \times 100 = 3.5\% \text{ increase}$$

\therefore Total earning of shopkeeper increased by 3.5%

32. (c) Let sum is P

P become 3 times in 8 years

It means simple interest in 8 years = 2P

and simple interest in 4 years = 1P

\therefore upto 20 years,

Total simple interest = $5 \times 4 = 5P$

\therefore Total money after 20 years = $5P + P = 6P$
= 6 times the money invested.

33. (c) From the formula

$$\begin{aligned} \text{C.I.} &= P \left(1 + \frac{r}{100} \right)^n - P \\ &= P \left[\left(1 + \frac{r}{100} \right)^n - 1 \right] \\ 1261 &= P \left[\left(1 + \frac{5}{100} \right)^3 - 1 \right] \\ &= P \left[\left(\frac{21}{20} \right)^3 - 1 \right] = P \left(\frac{21 \times 21 \times 21 - 20 \times 20 \times 20}{20 \times 20 \times 20} \right) \end{aligned}$$

$$\begin{aligned} \Rightarrow P &= \frac{1261 \times 20 \times 20 \times 20}{21 \times 21 \times 21 - 20 \times 20 \times 20} \\ &= \frac{1261 \times 20 \times 20 \times 20}{9201 - 8000} \\ &= \frac{1261 \times 8000}{1201} \\ &= 8000 \end{aligned}$$

\therefore The sum of money invested is ₹8000.

34. (c) Work done by A in 1 day = $\frac{1}{25}$

$$\text{Work done by B in 1 day} = \frac{1}{20}$$

Work done in 5 days when both A and B were working

$$= 5 \left(\frac{1}{20} + \frac{1}{25} \right)$$

$$= \frac{(25 + 20)}{20 \times 25} \times 5 = \frac{45 \times 5}{20 \times 25} = \frac{9}{20}$$

$$\text{Remaining work} = 1 - \frac{9}{20} = \frac{11}{20}$$

\therefore Time required by B to complete the remaining $\frac{11}{20}$ work
 $= \frac{11}{20} \times 10 = 11$ days.

35. (a) Given $5m = 7w$

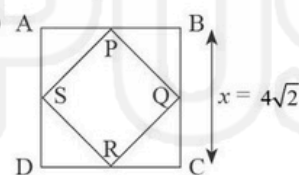
Let amount earned by $(10m + 5w) = x$

According to question,

$$\frac{5m}{1372} = \frac{10m + 5w}{x}$$

$$\Rightarrow \frac{7w}{1372} = \frac{19w}{x} \quad [\because 5m = 7w \Rightarrow 10m = 14w]$$

$$\Rightarrow x = \frac{1372 \times 19}{7} = ₹3724$$

36. (d) 

Side = x

Perimetre = $4x$

$$4x = 16\sqrt{2}$$

$$x = 4\sqrt{2}$$

$$\begin{aligned} (RS)^2 &= (PR)^2 + (PS)^2 \\ &= (2\sqrt{2})^2 + (2\sqrt{2})^2 \\ &= 8 + 8 = 16 \end{aligned}$$

$$RS = 4 \text{ cm}$$

Perimetre of PQRS = $4 \times 4 = 16 \text{ cm}$

37. (a) Suppose there are 2 squares
 Perimetre of square A = 40 cm
 Perimetre of square B = 32 cm
 \Rightarrow side of square A = 10 cm [\because Perimetre of square = $4 \times$ side]
 side of square B = 8 cm
 Area of square A = (side)²
 $= (10)^2 = 100 \text{ cm}^2$
 Area of square B = $(8)^2 = 64 \text{ cm}^2$
 Area of square C = A - B
 $= 100 - 64 = 36 \text{ cm}^2$
 Side of square C = 6 cm
 \therefore Perimetre of square C = $4 \times 6 = 24 \text{ cm}$

38. (c) Let x people will get ₹500 and y people will get ₹100
 $500x + 100y = 50000$
 $x + 5y = 500$... (i)
 $x + y = 200$... (ii)
 From eqn. (i) and (ii), we get
 $4x = 30$
 $x = 75$

39. (d) ABCD is a parallelogram
 Hence, AB = CD, BC = AD
 AB + BC = CD + DA
 $\therefore 3x - 1 + xy + 3 = 25 + y + 28$
 $\Rightarrow 3x + 2y + 2 = 25 + y + 28$
 $\therefore AB = CD$ and $BC = DA$
 $\Rightarrow 3x - 1 = 25$ and $2y + 3 = y + 28$
 $\Rightarrow x = \frac{26}{3}, y = 25$
 $x + y = \frac{26}{3} + 25 = \frac{101}{3}$
 $= 33.67 = 33$

40. (d) $2x + 3x + 5x + 8x = 360^\circ$
 $13x = 360^\circ$
 $x = 200$
 Largest angle = $20 \times 8 = 160^\circ$
 Smallest angle = $2 \times 20 = 40^\circ$
 Difference = $160 - 40 = 120^\circ$

41. (d) $a^2 + b^2 + c^2 = 2(ab - c) - 3$
 $\frac{a^2 - 2a + 1}{(a-1)^2} + \frac{b^2 + 2b + 1}{(b+1)^2} + \frac{c^2 + 2c + 1}{(c+1)^2} = 0$
 $(a-1)^2 = 0$
 $a = 11$
 Similarly $b = -1, c = -1$
 $(2a - 3b + 45) = 2 \times 1 - 2 \times (-1) + 45 (-1)$
 $= 2 + 3 - 4$
 $= 5 - 4 = 1$

42. (a) $\frac{5x+5}{8x-4} = \frac{1}{1}$
 $5x + 5 = 8x - 4$
 $9 = 3x$
 $x = 3$
 Age of Raju = $5 \times 3 = 15$ years

43. (a) Solving through option
 $a = 58 \rightarrow 58 + 85 = 143$
 $\therefore 58$

44. (a) $\left(x - \frac{1}{x}\right)^2 = 36$
 $x^2 + \frac{1}{x^2} - 2 = 36$
 $x^2 + \frac{1}{x^2} = 38$
 $x^4 + \frac{1}{x^4}$
 $\left(x^2 + \frac{1}{x^2}\right)\left(x^2 + \frac{1}{x^2}\right) - 2$
 $38 \times 38 - 2$
 $= 1444 - 2$
 $= 1442$

45. (b) $x^2 - y^2 + 2yz - z^2$
 $= x^2 - (y^2 - 2yz + z^2)$
 $= x^2 - (y - z)^2$
 $= (x + y - z)(x - y + z)$

46. (d) LCM of 8, 15, 20
 $2^3 \cdot 5^3 \cdot 2^2 \times 5$
 $\Rightarrow 8 \times 3 \times 5 = 120$

On checking
 $\Rightarrow \frac{3600}{120} = 30 = 3600$

47. (c) $1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 225$... (i)
 $2^2 + 4^2 + 6^2 + 8^2 + 10^2 = ?$
 $2^3 (1^3 + 2^3 + 3^3 + 4^3 + 5^3)$
 $= 2^3 \times 225$
 $= 8 \times 225 = 1800$

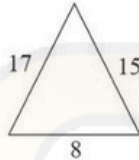
48. (a) $3\sqrt{0.008} + 3\sqrt{0.343} - \sqrt{0.25}$
 $0.2 + 0.7 - 0.5 = 0.4$

49. (b) $\sqrt{\frac{9}{16}} + (0.008)^{\frac{2}{3}} - \left(\frac{7}{10}\right)$
 $= \frac{3}{4} + (0.2)^{-2} - 1$
 $= \frac{3}{4} + \frac{100}{4} - 1$

$$= \frac{99}{4} = 24\frac{3}{4}$$

50. (a) 9801

51. (d) 8, 15, 17

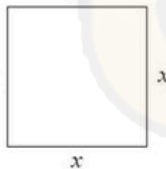


$$17^2 = 8^2 + 15^2$$

$$289 = 64 + 225$$

$$289 = 289$$

∴ 8, 15, 17



52. (c) x

Area of square field = 60025 m²

Let side = x m

$$x^2 = 60025$$

$$x = \sqrt{60025} = 245$$

Perimetre = 4 × 245 = 980 m

$$\Rightarrow 18 \times \frac{5}{18} \text{ m/sec}$$

$$\Rightarrow 196 \text{ sec}$$

53. (a) 9²⁰¹ = 4)201(5

$$\begin{array}{r} 20 \\ 1 - 9 \end{array}$$

$$\therefore 9^1 = 9$$

54. (c) Let 4 prime numbers are a, b, c, d

As per the question,

$$a \times b \times c = 455$$

$$b \times c \times d = 1729$$

$$\begin{array}{r|l} 5 & 455 \\ \hline 7 & 91 \\ 13 & 13 \end{array} \quad \begin{array}{r|l} 7 & 1729 \\ \hline 13 & 247 \\ 19 & 19 \end{array}$$

$$\frac{a \times b \times c}{b \times c \times d} = \frac{5 \times 7 \times 13}{7 \times 13 \times 19}$$

$$\frac{a}{d} = \frac{5}{19}$$

∴ First prime number = 5

Largest prime number = 19

55. (b) Largest four digit number is 9999

Dividing it by 345 we get:

$$345 \overline{)9999(28}$$

$$\underline{690}$$

$$3099$$

$$\underline{2760}$$

$$339$$

$$\therefore 345 - 339 = 6$$

56. (d) Number of bricks = $\frac{33 \times 100 \times 35 \times 100 \times 40}{22 \times 10 \times 7} \times \frac{9}{10}$

$$= 3 \times 10 \times 0.5 \times 10 \times 20 \times 9$$

$$= 30 \times 0.5 \times 200 \times 9 = 27000$$

57. (a) Possible event = 2, 4, 6, 8 → 4

Total events = 1, 2, 3, 4, 5, 6, 7, 8 → 8

$$\text{Probability of occurring even number} = \frac{4}{8} = \frac{1}{2}$$

58. (d) No. of people with age group 15 and 16 = 18

$$\% = \frac{18}{50} \times 100 = 36\%$$

59. (a) $l \times b \times h = 150$... (i)

$$2(l + b) = 50$$

$$l + b = 25$$

$$lbh = 150$$

$$= 15 \times 10 \times 1$$

If $l = 15$

$$b = 10$$

$$h = 1$$

Eqn. (i) and (ii)

$$\frac{l}{b} = \frac{15}{10}$$

$$= 3 : 2$$

60. (b) $260 \times 140 \times h = 54600$

$$h = \frac{546}{26 \times 14} = 1.5 \text{ m}$$

61. (c) Let the number to be multiplied = x

$$(23)^{-3} \times x = (69)^{-1}$$

$$\frac{1}{(23)^3} \times x = \frac{1}{69}$$

$$\frac{x}{(23)^3} = \frac{1}{69}$$

$$69x = 23 \times 23 \times 23$$

$$x = \frac{23 \times 23}{3} = \frac{529}{3}$$

62. (c) $(6 + 3) \times \frac{1}{9} + \frac{1}{3} + 2^2$

$$\frac{9}{3} \times \frac{1}{9} + \frac{3}{1} = \frac{1}{4} = 3\frac{1}{4} = \frac{13}{4}$$

63. (d) Time needed for emptying the tank

$$= \frac{9 \times 10}{10 - 9} = \frac{90}{1} = 90 \text{ hours}$$

64. (c) $2^{2x-1} - \frac{1}{8^{x-3}}, x = ?$

checking the option

$$2^{2-x^1} - \frac{1}{8^{x-3}} = 2^3 = 8 = 8$$

65. (a) $5^{2p} + 5^p + 5^0 = 651$

$$5^{2p} + 5^p + 1 = 651$$

$$5^p (5^p + 1) = 650$$

looking at the options,

$$p = 2$$

$$5^2(5^2 + 1) = 650$$

$$26 = \frac{650}{25} = 26$$

$$\Rightarrow 26 = 26$$

$\therefore p = 2$ (correct answer)

66. (c) A chemical reaction is a process by which two or more molecules interact to produce new products.

Compounds that interact to form new compounds are referred to as reactants, while the newly formed compounds are referred to as products.

A chemical change must occur in a chemical reaction, which is commonly observed with physical changes such as precipitation, heat production, colour change, and so on.

A reaction can occur between two atoms, ions, or molecules in which they form a new bond without destroying or creating an atom, but a new product is formed from reactants.

The rate of reaction is affected by factors such as pressure, temperature, and reactant concentration.

67. (a) To live in an extremely cold climate, the polar bear has many adaptations, such as: (a) A layer of fat under the skin for insulation. (b) Long curved and sharp claws to walk and run on slippery ice.

68. (d) Weathering is a slow process of soil formation. The soil is formed by the process of weathering, in which the rocks break down by the action of wind, water and climate.

The soil is classified on the basis of the proportion of particles of various sizes. If the amount of large and fine particles is about the same, then the soil is called loamy. The loamy soil consists of sand, clay and silt along with humus.

69. (b) A student has put a drop of dilute solution of sodium hydroxide first on a strip of blue litmus paper and then on a strip of red litmus paper. His observations must be: No change in blue litmus paper but the red litmus paper turns blue.

70. (d) Grass \rightarrow Insects \rightarrow Frog \rightarrow Snake \rightarrow Eagle is the correct order of these components in food chain.

71. (c) The kharif crops include rice, maize, sorghum, pearl millet/bajra, finger millet/ragi (cereals), arhar (pulses), soyabean, groundnut (oilseeds), cotton etc. The rabi crops include wheat, barley, oats (cereals), chickpea/gram (pulses), linseed, mustard (oilseeds) etc.

72. (d) Agricultural practices/processes:

(2) Crop Rotation

(3) Field Fallow

(4) Adding Manure and Fertiliser add nutrition to the soil.

73. (a) An element can be defined as the substance that can not be broken down into simpler substance.

All elements are composed of atoms which are further composed of electrons, protons and neutrons.

Examples- Gold (Ag), Silver (Au), Oxygen (O) etc.

A chemical compound is a substance constituting atoms of more than one element held together by a chemical bond.

One compound can be transformed into other compounds with the help of chemical reactions.

Types – Molecular, ionic, intermetallic, etc.

Examples – NaCl, H₂SO₄, MgCl₂ etc.

Mixture is a combination of two or more substances without any chemical reactions.

The constituent of a mixture remain separated from each other.

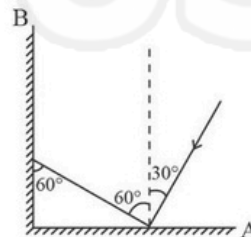
Example– Air, milk, etc.

74. (a) Convex mirror does not form images on the same side of the object, concave mirror never forms erect images on the same side of the object and the image formed by convex lens is not diminished in such case.

When object is placed beyond focal length of a concave lens as shown in the diagram, image formed is virtual, diminished and on the same side of the lens as object.

75. (b) The amount of water recommended by the United Nations for drinking, washing, cooking and maintaining proper hygiene is a minimum of 50 litres per person per day. This amount is about two and a half buckets of water per person per day.


76. (b)



\therefore The angle of reflection for the ray reflected from mirror B would be 60°.

77. (d) The correct sequence of three planets of the solar system in increasing order of their distance from the sun is Venus, Earth, Mars.

78. (d) A planet of our solar system which has no satellite of its own is Venus.

79. (d) The Richter scale was developed by Charles F. Richter in 1934. It used a formula based on the amplitude of the largest wave recorded on a specific type of seismometre and the distance between the earthquake and the seismometre.
80. (a)
- 
- S_1 is the correct answer.
81. (c) As the solution of copper sulphate is evaporated, water evaporates, leaving behind the solid copper sulphate.
82. (b) Parallel venation and fibrous root is observed in the grass.
83. (a) Saprotrophic nutrition is a process of chemoheterotrophic extracellular digestion involved in the processing of decayed (dead or waste) organic matter. It occurs in saprotrophs, and is most often associated with fungi (for example Mucor) and soil bacteria. Saprotrophic microscopic fungi are sometimes called saprobes; saprotrophic plants or bacterial flora are called saprophytes.
84. (c) The correct combination of organs that do not carry out any digestive functions are the esophagus, large intestine, and rectum.
85. (c) Banana and Pumpkin. In banana: stem, fruit and flower are edible and in pumpkin: flower and fruit are edible.
86. (d)
87. (c) Total distance = $36 \times \frac{20}{60} + 54 \times \frac{20}{60}$
 $= 12 + 18$
 $= 30 \text{ km}$
88. (d) In this case we observe that it deflects a compass needle placed near it.
89. (a) Sometimes the athletes suffer from muscle cramps. It is due to anaerobic respiration in which glucose is converted into lactic acid only.
90. (b) In human bodies, the exchange of gases between blood and tissues and the absorption of nutrients take place in the capillaries.
91. (a) Bryophyllum can reproduce by its leaves. Bryophyllum is a group of plant species of the family Crassulaceae native to Madagascar. It is a section or subgenus within the genus Kalanchoe, and was formerly placed at the level of genus.
92. (d) Plants also need chlorophyll, water, carbon dioxide besides sunlight for photosynthesis.
93. (a) Silk fibre consists of sericin and fibroin mainly, both of which are proteins. Fat and cellulose are not present in silk fibre.
94. (b) The metal has high thermal conductivity, i.e., they conduct heat faster and also metal is a good conductor of heat. Hence, it takes away your body heat as you touch it and which makes your body temperature to drop, therefore you feel the coldness when you touch a piece of metal.
95. (a)
96. (b) Transpiration is the process of water movement through a plant and its evaporation from aerial parts, such as leaves, stems and flowers. Water is necessary for plants but only a small amount of water taken up by the roots is used for growth and metabolism. The remaining 97–99.5% is lost by transpiration and guttation.
97. (b) Examples of contact forces include frictional force, tensional force, normal force, air resistance force, and applied force.
98. (b) In the given water tank, the water will flow with same pressure from tap B and C.
99. (d) In the given experiment, it is observed that copper gets transferred from positively charged electrode to negatively charged electrode.
100. (c) Increased concentration of carbon dioxide gas in the environment may cause global warming. Carbon dioxide is highly potent greenhouse gas.

□□□