Sainik School
Entrance Exam (Class IX)

SOLVED PAPER 2018

Instructions

1. This question paper contains 125 questions, which is divided into following four sections.
Section I Mathematics (50 Questions); **Section II** English (25 Questions); **Section III** General Science (25 Questions) and **Section IV** Social Studies (25 Questions)
2. **Section I** Mathematics each question carries 4 marks and **Section II** English, **Section III** General Science & **Section IV** Social Studies each question carries 2 marks.
3. The candidate is expected to attempt all questions.

Paper I

Section I Mathematics

1. If a number 573xy is divisible by 90, then what is the vlaue of x + y?
(a) 6 (b) 9 (c) 3 (d) 8

2. Which of the following numbers is in standard form?
(a) $\frac{-24}{52}$ (b) $\frac{-49}{71}$ (c) $\frac{-27}{48}$ (d) $\frac{28}{-105}$

3. What should be added to $\frac{-5}{7}$ to get $\frac{-2}{3}$.
(a) $\frac{-29}{21}$ (b) $\frac{29}{21}$
(c) $\frac{1}{21}$ (d) $\frac{-1}{21}$

4. The age of A and B are in the ratio 5 : 7. Four years from now the ratio of their ages will be 3 : 4. Then the present age of B is
(a) 20 year (b) 28 years
(c) 15years (d) 21 years

5. Two consecutive even numbers are such that half of the larger number exceeds one-forth of the smaller number by 5. Then the larger number is:
(a) 16 (b) 18 (c) 32 (d) 34

6. If $0.25\,(4f-3) = 0.05(10f-9)$, then f is equal to :
(a) 0.6 (b) 0.8 (c) 0.5 (d) 0.4

7. A number consists of two digits. The digit in the tens place exceeds the digit in the units place by 4. The sum of the digit is $\frac{1}{7}$ of the number. The number is
(a) 27 (b) 72 (c) 48 (d) 84

8. How many sides does a regular polygon have, wherein, whose interior angle is eight times its exterior angle ?
(a) 16 (b) 24
(c) 18 (d) 20.

9. ABCD is a rectangle with $\angle BAC = 48°$ Then $\angle DBC$ is equal to
(a) 38° (b) 42°
(c) 48° (d) 132°

10. The angles A,B,C,D of a quadrilateral ABCD taken in order are in the ratio 3 :7 :6 :4, then ABCD is a
(a) Rhombus (b) Parallelogram
(c) Trapezium (d) Kite

11. A data set of n observations has mean $2\overline{x}$. While another date set of 2n observations has mean $\overline{X}$. Then the mean of the combined data set of 3n observations will be
(a) $\overline{x}$ (b) $\frac{3}{2}\overline{x}$ (c) $\frac{2}{3}\overline{X}$ (d) $\frac{4}{3}\overline{X}$

12. In a class of 17 students, six boys failed in a test. Those who passed scored 12, 15, 17, 15, 16, 15, 19, 17, 18, 18 and 19 marks. The median score of 17 students in the class is
(a) 15 (b) 16 (c) 17 (d) 18

13. The mean age of a class is 16 years. If the class teacher aged 40 years old is also included, the mean age increases to 17 years,. The number of students in the class are:
(a) 23 (b) 33 (c) 44 (d) 16

14. From a well shuffled deck of 52 cards, one card is drawn at random. What is the probability that the drawn card is a queen?
(a) $\frac{1}{4}$ (b) $\frac{1}{52}$ (c) $\frac{1}{13}$ (d) $\frac{1}{26}$

15. Which of the following numbers is not a perfect square?
(a) 3600 (b) 6400 (c) 81000 (d) 2500

16. Which least number must be subtracted from 176 to make it a perfect square?
(a) 16 (b) 7 (c) 10 (d) 4

17. $\frac{\sqrt{288}}{\sqrt{128}}$ is equal to
(a) $\frac{3}{2}$ (b) 1.49 (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{3}{\sqrt{2}}$

18. The volume of a cubical box is 32.768 cubic metres. Then the length of a side of the box is
(a) 32 m (b) 320 m (c) 768 m (d) 3.2 m

19. By what least number should 648 be multiplied to get a perfect cube?
(a) 3 (b) 6 (c) 9 (d) 18

20. Given that $3048625 = 3375 \times 729$. Then what is the cube root of 3048625 ?
(a) 155 (b) 135
(c) 45 (d) None of these

21. I borrowed ₹ 12000 from Jamshed at 6% per annum simple interest for 2 years. Had I borrowed this sum at 6% per annum compound interest, what extra amount would I have to pay?
(a) ₹ 144 (b) ₹ 1440 (c) ₹ 72 (d) ₹ 43.20

22. During a sale, a shop offered a discount of 10% on the marked price of all the items. What would a customer have to pay for a pair of jeans marked at ₹ 1450 and two shirts marked at ₹ 850 each?
(a) ₹ 2835 (b) ₹ 3150
(c) ₹ 2300 (d) None of these

23. If the cost price of 10 greeting cards is equal to the selling price of 8 greeting cards. Then the gain or loss % is
(a) loss of 25% (b) loss of 20%
(c) gain of 25% (d) gain of 20%

24. *A* can do a piece of work in 20 days which *B* alone can do in 12 days. *B* worked at it for 9 days then *A* can finish the remaining work in:
(a) 3 days (b) 5 days
(c) 7 days (d) 11 days

25. A car takes 2 hours to reach a destination by travelling at 60 km/hr. How long will it take while travelling at 80 km/hr?
(a) 1 hrs 30 min (b) 1 hrs 40 min
(c) 2 hrs 40 min (d) None of these

26. If $x + \frac{1}{x} = 5$ then $x^2 + \frac{1}{x^2} = ?$
(a) 25 (b) 27
(c) 23 (d) $25\frac{1}{25}$

27. $(a+1)(a-1)(a^2+1)$ is equal to
(a) $(a^4 - 2a^2 - 1)$ (b) $(a^4 - a^2 - 1)$
(c) $(a^4 + 1)$ (d) $(a^4 - 1)$

28. $(82)^2 - 18^2$ is equal to
(a) 8218 (b) 6418
(c) 6400 (d) 7204

29. How many edges does a square prism have
(a) 9 (b) 12 (c) 16 (d) 8

30. Three cubes of iron whose edges are 6 cm, 8 cm and 10 cm respectively are melted and formed into a single cube. The edge of the new cube formed is
(a) 12 cm (b) 14 cm (c) 16 cm (d) 24 cm

31. If the capacity of a cylindrical tank is $1848 m^3$ and the diameter of its base is 14m, the depth of the tank is:
(a) 8m (b) 12m (c) 16m (d) 18m

32. The edges of a cuboid are the ratio 1 : 2 : 3 and its surface are is $88 cm^2$. The volume of the cuboid is
(a) $64 cm^3$ (b) $96 cm^3$
(c) $120 cm^3$ (d) $48 cm^3$

33. The parallel sides of a trapezium are in the ratio 4 : 3 and the perpendicular distance between them is 12cm. If the Area of the trapezium is $630 cm^2$, then its shorter of the parallel side is:
(a) 45 cm (b) 42 cm
(c) 60 cm (d) 36 cm

34. The bases of a triangle is four times its height and its area is $50\,m^2$. The length of its base is
(a) 10m (b) 15m (c) 20m (d) 25m

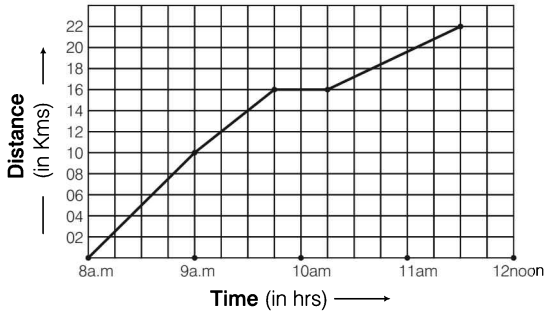
35. $\frac{3^n \cdot 3^{2n+1}}{9^n \cdot 3^{n-1}}$ is equal to
(a) 1 (b) 9 (c) 3 (d) 3^n

36. $4^{3.5}:2^5$ is the same as
(a) 4 : 1 (b) 2 : 1 (c) 7 : 5 (d) 7 : 10

37. If $a = b^{2/3}$ and $b = c^{-2}$ then what is the value of a in terms of c?
(a) $\frac{4}{C^3}$ (b) $\sqrt[3]{C^4}$
(c) $\frac{1}{\sqrt[3]{C^4}}$ (d) $\sqrt[4]{C^3}$

Directions (Q. Nos. 38-42) *Read the following information and refer the graph to answer the questions.*

A courier person cycles from a town to a neighbouring suburban area to deliver a parcel to a merchant. His distance from the town at different times is shown by the above graph?



38. What is the scale taken for the time axis?
(a) 2 units = 1 hours (b) 1 units = 2 hours
(c) 1 units = 4 hours (d) 4 units = 1 hours

39. How much time did the person take for the travel?
(a) 2 hours (b) $2\frac{1}{2}$ hours
(c) $3\frac{1}{2}$ hours (d) 4 hours

40. How far is the place of the merchant from town?
(a) 11 km (b) 22 km
(c) 13 km (d) 26 km

41. When did the person stop on the way?
(a) between 8 am to 9 am
(b) between 9 am to 10 am
(c) between 10 : 00 am to 10 : 30 am
(d) between 10 : 30 am to11 : 30 am

42. During which period did he ride the fastest?
(a) between 8 am to 9 am
(b) between 9 am to 10 am
(c) between 10 : 00 am to 10 : 30 am
(d) between 10 : 30 am to11 : 30 am

43. Find the values of A, B, C in the following

$$\begin{array}{r} 9\overline{)4AB5C} \\ -45 \\ \hline 3B \\ -36 \\ \hline 0 \end{array}$$

Then what is the value of A + B + C ?
(a) 10 (b) 14
(c) 16 (d) 18

44. If y denotes the digit at hundreds place of the number 67 y 19, such that the number is divisible by 11. The value of y is
(a) 3 (b) 5
(c) 4 (d) 7

45. Find three whole numbers a, b and c such that $a + b + c = a \times b \times c$, then what is the value of $a^2 + b^2 + c^2$?
(a) 14 (b) 15 (c) 16 (d) 17

46. $3 + 23y - 8y^2$ is equal to
(a) $(1 - 8y)(3 + y)$ (b) $(1 + 8y)(3 - y)$
(c) $(1 - 8y)(y - 3)$ (d) $(8y - 1)(y + 3)$

47. A motor car starts with a speed of 70 km/hr with its speed increasing every 2 hrs by 10 km/hr. In how many hours will it cover 345 kms?
(a) $2\frac{1}{4}$ hrs (b) 4 hrs 5 min
(c) $4\frac{1}{2}$ hrs (d) 3 hrs

48. $\left(\frac{1}{4}X^2 - \frac{1}{2}X - 12\right) \div \left\{\frac{1}{2}X - 4\right\}$ is equal to
(a) $\left(X + \frac{3}{2}\right)$ (b) $\left(\frac{1}{2}X - 3\right)$
(c) $(2x + 3)$ (d) $\left(\frac{1}{2}X + 3\right)$

49. 1200 soldiers in a fort had enough food for 28 days. After 4 days, some soldiers were transferred to another fort and thus the food lasted now for 32 more days. How many soldiers left the fort?
(a) 300 (b) 400
(c) 200 (d) 100

50. If the perimeter of an isosceles right triangle is $(6 + 3\sqrt{2})$ m, then the area of the triangle is
(a) 5.4 m^2 (b) 81 m^2
(c) 9 m^2 (d) 4.5 m^2

Section II English

51. The correctly punctuated sentence is :.
(a) He, asked me, "whether I had done my work".
(b) He asked me'."whether I had done my work" ?
(c) He asked me whether I had done my work?
(d) He asked me whether I had done my work.

52. Which of the following will be the correct indirect speech if the statement given below is changed into it?
He said, 'l shall leave these papers here'.
(a) He said that he would leave those papers there.
(b) He said that he should leave those papers there.
(c) He said that he would leave these papers there.
(d) He said that he would leave those papers here.

53. The correct passive form of the following sentence is : .
They asked me my name.
(a) My name was asked me by them.
(b) I was asked my name.
(c) Me was asked my name by them.
(d) My name was asked from them..

54. The correct meaning of the word 'calamity' is:
(a) disaster (b) scourge
(c) harm (d) injury

55. 'Red Letter Day' means:
(a) a dangerous day (b) a rosy day
(c) an important day (d) a bloody day

56. The correct antonym of the word 'assets' is
(a) liabilities (b) estate
(c) responsibilities (d) hindrances

57. The plural form of 'alumnus' is:
(a) alumnuses (b) alumna
(c) alumnae (d) alumni

58. 'Alma Mater' is the place where one
(a) studied (b) married
(c) died (d) was born

59. Identify the part which contains an error in the following sentence.
Ten miles are not a long distance.
(a) ten miles
(b) are not
(c) a long dlstance
(d) no error·

60. Choose the correct order to make the sentence below meaningful.
History of India (1) / than (2)/ was there a (3)/ Mahatma Gandhi (4)/ never in the (5)/ greater man (6).
(a) 124356 (b) 634521
(c) 513126 (d) 513624

61. Fill in the blank with a suitable Phrase Preposition.
He accepted the car.....his claim for ₹ 325000.
(a) on account of (b) by dint of
(c) in lieu of (d) because of

62. The suitable prefix for the word "bitter" is:
(a) im (b) in
(c) un (d) em

63. Fill In the blank with a a suitable conjunction.
He is slow ..... he is sure.
(a) and (b) for
(c) but (d) or

64. Complete the following maxim.
Genius without education is like silver in the .....
(a) shop. (b) mine
(c) Well (d) pit

65. Select the word that is opposite in meaning to the underlined word.
My first lecture in the classroom was a <u>fiasco</u>.
(a) success (b) joy
(c) fun (d) disaster

66. The right suffix for the word 'just' to make it an abstract noun is
(a) – ly (b) – ify (c) – ice (d) –ing

67. Select the-word that is similar in meaning to the underlined word.
The <u>requisite</u> energy is derived from the battery.
(a) insignificant (b) necessary
(c) different ' (d) special

68. Select the word that is similar in meaning to the underlined word.
His <u>candid</u> opinion has won him many friends.
(a) kind (b) courteous
(c) generous (d) frank

69. Select the word that is opposite in meaning to the underlined word.
Everyone agreed that it was a piece of <u>meticulous</u> research.
(a) careless (b) careful
(c) cautious (d) scrupulous

70. The word 'avert' means
(a) avoid (b) fall
(c) hatred (d) degenerate

71. The adjective form of boast is
(a) boastful (b) boastly
(c) boasty (d) boastile

Directions (Q. Nos. 72-75) *Read the following passage and answer the questions that follow.*

Vehicles do not move about the roads for mysterious reasons of their own. They move only because people want them to move in connection with the activities which the people are engaged in. Traffic is therefor a 'function of activities', and because, in towns, activities mainly take place in buildings, traffic in towns is a 'function of buildings'. The implications of this line of reasoning are inescapable.

72. Line 1 of the passage means that the vehicles move on the roads
(a) for reasons difficult to explain.
(b) to serve specific purposes of people.
(c) in a haphazard fashion.
(d) in ways beyond our control.

73. The author says that traffic is a 'function of activities'. He means that
(a) human activities are taking place.
(b) human activities are dependent on traffic.
(c) traffic is not dependent on human activities.
(d) traffic is connected with human activities.

74. The author suggests by his argument that
(a) to regulate traffic, more policemen have to be employed.
(b) to regulate activities, traffic has to be controlled.
(c) to regulate traffic, buildings have to taken into consideration.
(d) to understand the traffic problem, we must examine the social context in which it is found

75. By 'this line of reasoning, the author means
(a) idea contained is this line.
(b) idea contained in anyone line of his argument.
(c) the manner.of arguing.
(d) this row of printed characters

Section III General Science

76. Tungsten (a transition element) being a metal exhibits the following properties
I. It is sonorous
II. It possesses high tensile strength
III. It possesses high melting point
IV. It has high density
Which of the above property/properties of Tungsten made it a suitable material for the filament of an electric bulb?
(a) I, II and III (b) II and III
(c) Only III (d) II, III and IV

77. Hepatitis B is.caused due to
(a) Virus (b) Protozoa
(c) Bacteria (d) Fungi

78. The production of an exact copy of an animal by asexual reproduction is known as
(a) Cloning (b) Mating
(c) Budding (d) Hatching

79. The device which can be used to detect very small current following in an electric circuit is
(a) LEAD (b) MCB
(c) LED (d) None of these

80. Which of these unicellular organisms has no definite shape?
(a) Amoeba
(b)Paramecium
(c) Euglena
(d) Bacteria

81. Which is a thermosetting plastic?
(a) Polythene (b) Melamine
(c) PVC (d) Nylon

82. Solution of which of the following oxides in water will change the colour of blue litmus to red?
(a) Sulphur dioxide (b) Magnesium oxide
(c) Iron oxide (d) Copper oxide

83. In India, PCRA advises how to save petrol/diesel while driving. For this, PCRA gave several tips. Here; PCRA stands for
(a) Pollution Control Research Association
(b) Petroleum Conservation Research Association
(c) Petroleum Collection and Reserve Association
(d) None of the above.

84. An electrolyte is
(a) a metal
(b) a solution
(c) a liquid that conducts current
(d) All of the above.

85. As the angle between two plane mirrors is decreasing gradually, the number of images of an object placed between them
(a) first increases then decreases
(b) first decreases then increases
(c) increases
(d) decreases

86. Purest form of carbon is
(a) Coal (b) Charcoal
(c) Coke (d) All of these

87. Value of one light year in S.1 unit is:
(a) 1.5×10^{11} m (b) 9.46×10^{15} m
(c) 1.5×10^{15} m (d) 9.46×10^{12} m

88. Which of the following liquids does not conduct electricity?
I. Lemon Juice
II. Sugar solution
III. Distilled water
IV. Dilute Hydrochloric acid
(a) I, II, and IV (b) Only III
(c) Only IV (d) III and IV

89. I- Fungi, II- Bacteria
Consider the following, statements and find the correct one
(a) II are small prokaryotes while I are large celled eukaryotes with defined mitochondria and other organelles.
(b) II have a sexual reproduction through conjugation and transformation but I through genetic recombination
(c) II have a sexual reproduction through conjugation and transformation but I through genetic recombination.
(d) All of the above

90. When the applied force is doubled and the object is still at rest, then friction becomes
(a) doubled (b) halved
(c) quadrupled (d) zero

91. Oxides of which element(s) is / are present in acid rain?
I. Carbon
II. Nitrogen
III. Sulphur
(a) I and II (b) II and III
(c) I and III (d) I, II and III

92. Which of the following tools would a farmer use to remove weeds from the field?
(a) hoe (b) plough
(c) axe (d) cultivator

93. .....are the smallest micro-organisms which can develop only inside the cell of the ..... organism. They do not respire, feed, grow, excrete or move on their own but they cannot ..... When they are outside the ..... cell, they behave as ..... Choose the correct order to fill the blanks
(a) Bacteria, Host, Multiply, Animal, Living
(b) Virus, Bacteria, Reproduce, Living, Non-living
(c) Virus, Host, Exchange gases, Living, Non-living
(d) Virus, Host, Reproduce, Living, Non-living

94. In the process of vulcanisation, Natural rubber is treated with an element X to improve its properties.
The element X can be:
(a) Carbon (b) Nitrogen
(c) Sulphur (d) Phosphorus

95. The standard value of atmospheric pressure is
(a) 78 cm of Hg (b) 76mm of Hg
(c) 45 cm of Hg (d) 0.76cm of Hg

96. The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of vibration?
(a) 2 s (b) 0.002s
(c) 0.02 s (d) 0.2 s

97. The change in focal length of an eye lens to focus the image of objects at varying distances is done by the action of
(a) Pupil (b) Iris
(c) Retina (d) Ciliary muscles

98. Which cell organelle is called the Power House of a cell ?
(a) Lysosomes
(b) Golgi bodies·
(c) Mitochondria
(d) Ribosomes

99. The dramatic changes in body features associated with puberty are mainly because of the secretions of
(i) Thyroxine
(ii) Estrogen
(iii) Adrenalin
(iv) Testosterone
(a) (i) & (ii) (b) (ii) & (iii)
(c) (i) & (iii) (d) (ii) & (iv)

100. The earth rotates around its axis. The sun appears to rise in the east. Venus rotates in the opposite direction of Earth. We can therefore assume that on Venus, the sun sets in the
(a) East (b) West
(c) North (d) South

Section IV Social Science

101. Who became The Nawab of Bengal after the death of Alivardi Khan?
(a) Murshid Quli Khan
(b) Mir Jafar
(c) Sirajuddaulah
(d) Mir Qasim

102. FIR means
(a) Final Information Report
(b) First Information Report
(0) Full Information Report
(d) First Investigation Report

103. How many MPs are elected to the Rajya Sabha?
(a) 272 (b) 250
(c) 245 (d) 233

104. What is the meaning of media sets the agenda?
(a) Media supports the government
(b) Media directs the people to agitate
(c) Media shapes our thoughts by giving more importance to some issues
(d) Media criticizes the government

105. The process in which different crops are grown in alternate rows is known as
(a) Crop rotation (b) Intercropping
(c) Terrace farming (d) Contour cropping

106. Which of the following statements is/are correct?
1. 'Diwani' is the right to collect revenue
2. 'Faujdari adalat' refers to a civil court
3. Richard Wellesley implemented the Subsidiary Alliance

Select the correct answer using the codes given below
(a) 1 only (b) 1, 2 and 3
(c) 1 and 3 only (d) 2 and 3 only

107. Which type of farming is practised to meet the needs of a farmer's family?
(a) Subsistence Farming .
(b) Organic Farming
(c) Commercial Farming
(d) Mixed Farming

108. Biotic resources are:
(a) made by human beings
(b) derived from living things
(c) derived from non living things
(d) none of the above

109. Separation of religion from the state means.
(a) Communalism (b) Democracy
(c) Secularism (d) All of the above

110. Arrange the following events of the Indian Freedom Movement in correct sequence beginning from the earliest:
1. The Non-Cooperation Movement
2. Quit India Movement
3. The Rowlatt Satyagraha
4. The March to Dandi

Select the correct answer using the code given below
(a) 3 1 4 2 (b) 1 2 3 4
(c) 3 1 2 4 (d) 1 3 2 4

111. The Young Bengal, Movement was led by
(a) Swami Vivekananda
(b) Keshab Chandra Sen
(c) William Jones
(d) Henry Louis Vivian Derozio

112. ..... refers to the court declaring that a person is not guilty of the crime which he/she was tried for by the court.
(a) Appeal (b) Acquit
(c) Accuse (d) None of these

113. Which of the following pairs is NOT correctly matched
1. Nana Sabheb - Kanpur
2. Rani Lakshmibai - Jhansi
3. Kunwar Singh - Lucknow
4. Bakht Khan - Delhi

Select the correct answer using the codes given below
(a) 1 and 3 (b) 3 only
(c) 4 only (d) 2 and 3

114. Which one of the following is a leading producer of copper in the world?
(a) Bolivia (b) Ghana
(c) Peru (d) Zimbabwe

115. AMUL stands for
(a) Anand Milk Union Limited
(b) Anand Milk United limited
(c) Anand Mazdoor Union Limited .
(d) Ahmedabad Milk Union Limited

116. How many permanent members are there in the UN Security Council?
(a) Three (b) Four
(c) Five (d) Six

117. Cultivation on planter's own land was referred to as
(a) Ryoti (b) Mahalwari
(c) Batai (d) Nij

118. Which of the following is a secondary activity?
(a) Transport
(b) Farming
(c) Obtaining sugar fr9om sugarcane .
(d) Bee keeping

119. Which one of the following is not a factor of soil formation?
(a) Topography (b) Soil texture
(c) Climate (d) Time

120. Viceroy..... partitioned Bengal in 1905 .
(a) Curzon (b) Minto
(c) Irwin (d) Mountbatten

121. The leaders of the Khilafat agitation were:
(a) Sayyid brothers (b) All brothers
(c) Both (a) and (b) (d) None

122. Which of the following is not a fundamental right of citizens of India?
(a) Right to equality (b) Right to education
(c) Right to property (d) Right to freedom

123. To complain about the problem of hygiene and sanitation, a person living in a big city should go to
(a) Municipal Corporation (b) Municipal Committee
(c) Nagar Panchayat (d) Zila Parishad

124. The Supreme Court was established on :
(a) 26 January 1950 (b) 15 August 1947
(c) 26 November 1949 (d) 15 August 1950

125. Which one of the following refers to the tomb of a Sufi Saint?
(a) Idgah (b) Khanqah
(c) Dargah (d) None

Answers

1	(c)	2	(b)	3	(c)	4	(a)	5	(b)	6	(a)	7	(d)	8	(c)	9	(*)	10	(c)
11	(d)	12	(a)	13	(a)	14	(c)	15	(c)	16	(b)	17	(a)	18	(d)	19	(c)	20	(b)
21	(d)	22	(a)	23	(c)	24	(b)	25	(a)	26	(c)	27	(d)	28	(c)	29	(b)	30	(a)
31	(b)	32	(d)	33	(a)	34	(c)	35	(b)	36	(a)	37	(c)	38	(d)	39	(c)	40	(b)
41	(*)	42	(a)	43	(d)	44	(c)	45	(a)	46	(b)	47	(c)	48	(d)	49	(a)	50	(d)
51	(d)	52	(a)	53	(b)	54	(a)	55	(c)	56	(a)	57	(d)	58	(a)	59	(b)	60	(d)
61	(c)	62	(d)	63	(c)	64	(b)	65	(a)	66	(c)	67	(b)	68	(d)	69	(a)	70	(a)
71	(a)	72	(b)	73	(d)	74	(d)	75	(c)	76	(c)	77	(a)	78	(b)	79	(c)	80	(a)
81	(b)	82	(a)	83	(b)	84	(b)	85	(c)	86	(b)	87	(b)	88	(b)	89	(a)	90	(a)
91	(d)	92	(a)	93	(d)	94	(c)	95	(b)	96	(b	97	(d)	98	(c)	99	(d)	100	(a)
101	(c)	102	(b)	103	(d)	104	(c)	105	(b)	106	(c)	107	(a)	108	(b)	109	(c)	110	(a)
111	(d)	112	(b)	113	(b)	114	(c)	115	(a)	116	(c)	117	(d)	118	(c)	119	(b)	120	(a)
121	(b)	122	(c)	123	(a)	124	(a)	125	(c)										

Hints & Solutions

1. Since, the number 573xy is divisible by 90 (i.e. 9×10). Therefore the last digit of the given number will be 0 i.e. y = 0.

Also it is divisible by 9. Therefore, the sum of digits is divisible by 9.

Now, sum of digits = 5 + 7 + 3 + x + y
= 5 + 7 + 3 + x + 0
= 15 + x

Here, we consider x = 3.

∴ Sum of digits = 15 + 3 = 18, which is divisible by 9.

Now, x + y = 3 + 0 = 3

2. Number $\frac{-49}{71}$ is in standard form.

3. Let x should be added in $-\frac{5}{7}$.

Then, $-\frac{5}{7}+x=-\frac{2}{3}$

$$\Rightarrow \quad x = -\frac{2}{3} + \frac{5}{7} = \frac{-14 + 15}{21} = \frac{1}{21}$$

4. Let present ages of *A* and *B* are x and y.

Then, $\frac{x}{y} = \frac{5}{7}$

$$\Rightarrow \quad x = \frac{5}{7}y$$

Also $\frac{x + 4}{y + 4} = \frac{3}{4}$

$$\Rightarrow \quad \frac{\frac{5}{7}y + 4}{y + 4} = \frac{3}{4}$$

$$\Rightarrow \quad \frac{20}{7}y + 16 = 3y + 12$$

$$\Rightarrow \quad 4 = \frac{1}{7}y$$

$$\Rightarrow \quad y = 28 \text{ yr}$$

Hence, present age of B is 20 yr.

5. Let two consecutive even numbers are x and x + 2. Then, according to the given number

$$\frac{1}{2}(x + 2) = \frac{1}{4}(x) + 5$$

$$\Rightarrow \quad 2x + 4 = x + 20$$

$$\Rightarrow \quad x = 16$$

$\therefore$ Large number = x + 2 = 16 + 2 = 18

6. $0.25(4f - 3) = 0.05(10f - 9)$

$$\Rightarrow \quad 25(4f - 3) = 5(10f - 9)$$

$$\Rightarrow \quad 100f - 75 = 50f - 45$$

$$\Rightarrow \quad 50f = 30$$

$$\Rightarrow \quad f = \frac{30}{50} = 0.6$$

7. Let unit's place digit be x and ten's place digit by y.

Then, two digit numbers = 10y + x.

According to the given condition.

$$y = x + 4 \qquad \ldots(i)$$

Also $x + y = \frac{1}{7}(10y + x)$ $\qquad \ldots(ii)$

On solving Eqs. (i) and (ii), we get

$$x = 4 \text{ and } y = 8$$

Hence, the required number = 10 × 8 + 4

$$= 84$$

8. $\because$ Interior angle = 180° − exterior angle

$\therefore$ 8 exterior angle = 180° − exterior angle

Exterior angle = $\frac{180°}{9} = 20°$.

$\because$ Exterior angle of a polygon = $\frac{360°}{\text{Number of sides}}$

Number of sides = $\frac{360°}{20°} = 18°$

10. Let angles of a quadrilateral 3x, 7x, 6x and 4x.

$\because$ The sum of all angles of a quadrilateral is 360°.

$\therefore \quad 3x + 7x + 6x + 4x = 360°$

$$\Rightarrow \quad 20x = 360°$$

$$\Rightarrow \quad x = 18°.$$

$\therefore \quad \angle A = 3 \times 18° = 54°$

$\angle B = 7 \times 18° = 126°$

$\angle C = 6 \times 18° = 108°$

$\angle D = 4 \times 18° = 72°$

Here, we see that $\angle A + \angle B = 54° + 126° = 180°$ and $\angle C + \angle D = 108° + 72° = 180°$.

Also, we see that, $\angle A \neq \angle C$ and $\angle B \neq \angle D$

Hence, A, B, C and D forms a trapezium.

11. Mean of combined data

$$= \frac{n(2\bar{x}) + 2n(\bar{x})}{n + 2n}$$

$$= \frac{2\bar{x} + 2\bar{x}}{3} = \frac{4}{3}\bar{x}$$

12. The ascending order of given data is

12, 15, 15, 15, 16, 17, 17, 18, 18, 19, 19

Since, six students are failed in test. Therefore, six students get score less than 12.

Here, n = 17 (odd)

$\therefore$ Median = $\frac{17 + 1}{2} = \frac{18}{2} = 9$ th

$\therefore$ 9th term will be 15.

13. Let number of students in a class be n.

Then, total age of 16 students in the class

$$= 16 \times n = 16n$$

Another condition,

$$17 = \frac{16n + 40}{n + 1}$$

$\Rightarrow \quad 17(n+1) = 16n + 40$

$\Rightarrow \quad 17n + 17 = 16n + 40$

$\Rightarrow \quad n = 23$

14. Total number of outcome in a deck of cards = 52

Favourable number of outcomes = Number of queens in a deck of cards = 4

$\therefore$ Probability of getting a queen

$$= \frac{\text{Total number of outcomes}}{\text{Favourable number of outcomes}} = \frac{4}{52} = \frac{1}{13}$$

15. $81000 = (90)^2 \times 10$, which is not a perfect square.

16. $176 = 169 + 7 = (13)^2 + 7$

Hence, least number 7 is subtracted to make a perfect square.

17. $\sqrt{\frac{288}{128}} = \sqrt{\frac{144}{64}} = \frac{12}{8} = \frac{3}{2}$

18. Volume of cubical box = $32.768\ m^3$

$\Rightarrow \quad (l)^3 = 32.768$,

Where l is the length of the cubical box.

$$l = 3.2\ m$$

Hence, length of cubical box is 3.2 m.

19. $648 = 81 \times 8 = (2)^3 \times (9)^2$

To make perfect cube, k we have to multiply by 9.

20. $3048625 = 3375 \times 729 = (15)^3 \times (9)^3$

$\therefore$ Cube root of $3048625 = 15 \times 9 = 135$

21. Given P = ₹12000, P = 6% and T = 2 yr.

Now, $SI = \frac{PRT}{100} = \frac{12000 \times 6 \times 2}{100} = 1440$

and $CI = P\left(1 + \frac{R}{100}\right)^T - P$

$$= 12000\left(1 + \frac{6}{100}\right)^2 - 12000$$

$$= 12000\left(\frac{106}{100}\right)^2 - 12000$$

$$= \frac{12000 \times 106 \times 106}{100 \times 100} - 12000$$

$$= 13483.2 - 12000 = 1483.2$$

The extra amount paid by Jamshed = CI − SI

$$= 1483.2 - 1440 = ₹\ 43.20$$

23. We know that, if the cost price of 'a' articles is equal to the selling price of b articles, then gain percentage $= \frac{a-b}{b} \times 100\%$

Here a = 10, b = 8

$\therefore$ Gain $\% = \frac{10-8}{8} \times 100\%$

$$= \frac{2}{8} \times 100\% = 25\%$$

24. One day's work of B $= \frac{1}{12}$

For 9 day's B do the work $= \frac{9}{12} = \frac{3}{4}$

$\therefore$ Remaining work $= 1 - \frac{3}{4} = \frac{1}{4}$

One day's work of A $= \frac{1}{20}$

$\therefore$ A do $\frac{1}{4}$ th work $= \frac{1}{5}$

Hence, A complete the remaining work in 5 days.

25. Distance cover in 2 hr $= 2 \times 60$

$$= 120\ km$$

$\therefore$ Distance cover in 1 hr $= \frac{120}{2} = 60\ km$

And distance cover in $\frac{1}{2}$ hr $= \frac{60}{2}$ km $= 30$ km

Hence, 120 km distance cover in time $= \left(1 + \frac{1}{2}\right)$ hr $= 1\frac{1}{2}$ hr.

26. $x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2$

$$= (5)^2 - 2 = 25 - 2 = 23$$

27. $(a+1)(a-1)(a^2+1)$

$$= (a^2 - 1)(a^2 + 1) = a^4 - 1$$

28. $(82)^2 - (18)^2 = (82 - 18)(82 + 18)$

$$= 64 \times 100 = 6400$$

29. Square prism has 12 edges.

30. Volume of combined cube = Volume of cube having edge 6 + Volume of cube having edge 8 + Volume of cube having edge 10

Volume of combined cube $= (6)^3 + (8)^3 + (10)^3$

$\Rightarrow$ $(\text{edge})^3 = 216 + 512 + 1000 = 1728$

$\Rightarrow (\text{edge})^3 = (12)^3$

Taking cubic roots both sides, we get

edge $= 12$ cm.

31. Volume of cylinder $= \pi r^2 h$

$$1848 = \frac{22}{7} \times \left(\frac{14}{2}\right)^2 \times h$$

$$\Rightarrow \quad h = \frac{1848 \times 7 \times 4}{22 \times 14 \times 14} = \frac{12936 \times 4}{4312} = 12\text{m}$$

Hence, depth of the tank is 12m.

32. Let edges of a cuboid be $l = x$, $b = 2x$ and $h = 3x$.

Then surface area of cuboid $= 2(lb + bh + hl)$

$= 2(x \times 2x + 2x \times 3x + 3x \times x)$

$= 2(2x^2 + 6x^2 + 3x^2)$

$\Rightarrow \quad 88 = 22x^2$

$\Rightarrow \quad x^2 = 4 \Rightarrow x = 2$ cm.

$\therefore$ Edges of a cuboid are

$l = 2, b = 2 \times 2 = 4, h = 3 \times 2 = 6$

$\therefore$ Volume of cuboid $= lbh = 2 \times 4 \times 6 = 48\ \text{cm}^3$

33. Let parallel sides of a trapezium be 4x and 3x.

Area of trapezium $= \frac{1}{2}$ (sum of parallel sides) $\times$ distance between two parallel sides

$$\Rightarrow \quad 630 = \frac{1}{2}(7x) \times 12$$

$$\Rightarrow \quad x = \frac{630 \times 2}{7 \times 12} = \frac{1260}{84} = 15$$

$\therefore$ The shorter parallel side $= 3x = 3 \times 15 = 45$ cm

34. Let height of a triangle be h. Then base $= 4h$

Area of triangle $= \frac{1}{2} \times 4h \times h$

$$\therefore \quad 50 = 2h^2 \Rightarrow h^2 = 25$$

$$h = 5\text{ m}$$

$\therefore$ The length of $= 4h = 4 \times 5 = 20$ m

35. $\dfrac{3^n \cdot 3^{2n+1}}{9^n \cdot 3^{n-1}} = \dfrac{3^{n+2n+1}}{3^{2n+n-1}}$

$$= \frac{3^{3n+1}}{3^{3n-1}} = 3^{(3n+1)-(3n-1)}$$

$$= 3^{1+1} = 3^2 = 9$$

36. $\dfrac{4^{3.5}}{2^5} = \dfrac{2^{2 \times 3.5}}{2^5} = 2^{7-5} = \dfrac{2^2}{1} = \dfrac{4}{1}$

37. $a = b^{2/3}$, $b = c^{-2}$

$$a = (c^{-2})^{2/3} = c^{-4/3} = \frac{1}{3\sqrt{c^4}}$$

Solutions 38 to 42

38. It is clear from the graph 4 blocks

(4 units) $= 1$ hour

39. The time taken by the person to travel a distance $= 3\frac{1}{2}$ hour

Since, the person reach the destination at point E. The perpendicular line from E to the horizontal line meet at point F.

The time taken by the person to travel the distance = Time taken from 8 am to 11 am + time taken from 11 am to 11 : 30 am.

[$\because$ at point F the time will be 11:30 am]

$= 3 + \frac{1}{2} = 3\frac{1}{2}$ hr

40. From the graph, it is clear that perpendicular line from E to the point a meets the vertical line at G.

The place of the merchant from town

$\therefore$ A to B is 22 km.

41. The person stop on the way between 9 : 45 am to 10 : 15 am.

42. He ride the fastest between 8 am to 9 am.

43. In the given division method,

$$A - 5 = 3 \Rightarrow A = 8$$

$$B - 6 = 0 \Rightarrow B = 6$$

And $\quad 3b = 9c \Rightarrow c = 4$

$\therefore A + B + C = 8 + 6 + 4 = 18$

44. Given number is 67y19.

Sum of odd digits $= 6 + y + 9 = 15 + y$

Sum of even digits $= 7 + 1 = 8$

Now difference $= 15 + y - 8 = 7 + y$

Since, above difference will be multiple of 11.

$\therefore \quad 7 + y = 11$ (say)

$y = 4$.

45. Since $a + b + c = a \times b \times c$

Consider $a = 1$, $b = 2$ and $c = 3$

which satisfy the given condition

$\therefore\ a^2 + b^2 + c^2 = (1)^2 + (2)^2 + (3)^2$

$= 1 + 4 + 9 = 14$

46. $3 + 23y - 8y^2$

$= -8y^2 + 23y + 3$

$= -(8y^2 - 23y - 3)$

$= -(8y^2 - (24 - 1)\, y - 3)$

[by splitting middle term]

$= -(8y^2 - 24y + y - 3)$

$= -(8y(y - 3) + 1\,(y - 3))$

$= -(8y + 1)\,(y - 3)$

$= (8y + 1)\,(3 - y)$

47. A motor car a has a speed of 70 km/h in first two km.

$\therefore$ It covers a distance in first two hours

$= 70 \times 2 = 140$ km

[distance = Speed × Time]

In next two hours, it speed will be $70 + 10 = 80$ km/h.

$\therefore$ Distance cover in two hours $= 80 \times 2 = 160$ km.

Again in next two hours, it speed will be $80 + 10 = 90$ km/h.

$\therefore$ Distance cover in $\frac{1}{2}$ hours $= \frac{90}{2}$ km/h

Total time to cover 345 km = Time taken in first 140 km. + Time taken in next 160 km + time taken in next 45 km.

$= 2 + 2 + \frac{1}{2} = 4\frac{1}{2}$ hr.

48. $\dfrac{\left(\frac{1}{4}x^2 - \frac{1}{2}x - 12\right)}{\frac{x}{2} - 4} = \dfrac{\frac{x^2 - 2x - 48}{4}}{\frac{x - 8}{2}}$

$= \dfrac{x^2 - (8 - 6)\,x - 48}{(x - 8) \times 2}$

[by splitting middle term]

$= \dfrac{x^2 - 8x + 6x - 48}{2(x - 8)}$

$= \dfrac{x(x - 8) + 6(x - 8)}{2(x - 8)}$

$= \dfrac{(x - 8)\,(x + 6)}{2(x - 8)} = \dfrac{x + 6}{2}$

$= \dfrac{x}{2} + 3$

49. Let the number of soldiers left the fort be x.

The according to the given condition,

$1200 \times 24 = x \times 32$

$\Rightarrow\quad x = \dfrac{1200 \times 24}{32} \Rightarrow x = 300$

50. Let equal sides of a right isosceles triangle be a unit and third be b unit.

Perimeter of an isosceles triangle $= 2a + \sqrt{2}a$

[$\because$ Hypotenuse $= \sqrt{a^2 + a^2} = \sqrt{2}a$]

$\Rightarrow\quad 6 + 3\sqrt{2} = 2a + \sqrt{2}a$

$\Rightarrow\quad 3(2 + \sqrt{2}) = a(2 + \sqrt{2})$

$\Rightarrow\quad a = 3$ m

$\therefore$ Area of right isosceles triangle

$= \frac{1}{2}a^2 = \frac{1}{2} \times (3)^2 = \frac{9}{2} = 4.5\ \text{m}^2$