

Previous Paper (Solved)

All India Sainik Schools

Entrance Exam (AISSEE)-2023*

Class-IX

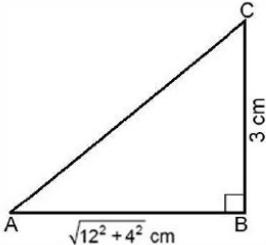
Section A : Mathematics

1. Arun bought binder clips at the rate of 5 for a rupee. He had to sell them at the rate of 6 for a rupee. Find his loss per cent in the transaction.

A. $\frac{40}{3}\%$ B. $\frac{50}{3}\%$
 C. $\frac{10}{3}\%$ D. $\frac{20}{3}\%$
 2. For what value of m
$$xy^2m = (2xy + 5y)^2 - (2xy - 5y)^2$$

A. -100 B. 100
 C. 40 D. -40

 3. Which is the like term as $84xy^2z^2$?

A. $-3 \times 8 \times x \times y \times z \times z$
 B. $12 \times 7 \times x \times x \times y \times z \times z$
 C. $-5 \times 6 \times x \times x \times y \times y \times z$
 D. $6 \times 4 \times x \times z \times y \times z \times y$
 4. ABC is a right angled triangle, which is right angled at B. If $AB = \sqrt{12^2 + 4^2}$ cm, $BC = 3$ cm, then find out the perimeter of the given figure:


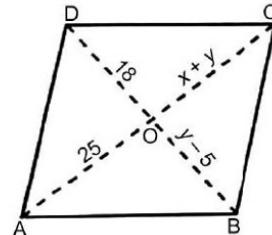
A. $(4\sqrt{10} + 16)$ cm B. $(16\sqrt{10} + 4)$ cm
 C. $(8\sqrt{10} + 2)$ cm D. $(2\sqrt{10} + 8)$ cm
5. A bicycle wheel makes 1000 revolutions in moving 2 km. Find the diameter of the wheel.

A. 1.57 m B. 1.27 m
 C. 6.036 m D. 0.636 m
 6. If $a = 5 + 2\sqrt{6}$ and $b = \frac{1}{a}$, then what will be the value of $a^2 + b^2$?

A. 100 B. 96
 C. 102 D. 98
 7. Gauransh has 290 cards. Tanya has 150 cards. How many cards must Gauransh give to Tanya so that Tanya may have 3 times as many cards as Gauransh?

A. 180 B. 40
 C. 140 D. 80
 8. A's present age is twice that of B. If B's age 5 years ago was b , then what is A's present age?

A. $2b + 5$ B. $2b - 5$
 C. $2b - 10$ D. $2b + 10$
 9. If ABCD is a parallelogram, then find the value of x and y , where $OC = x + y$, $OD = 18$, $OB = y - 5$ and $OA = 25$.



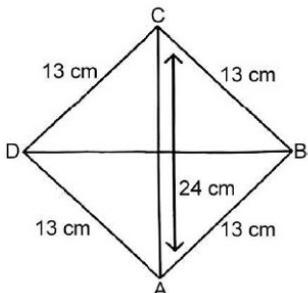
- A. $x = 13, y = 12$ B. $x = 2, y = 23$
 C. $x = 23, y = 2$ D. $x = 12, y = 13$

- 10. Statement A:** Every parallelogram is a trapezium and every rhombus is a kite.

Statement B: Every rectangle is a square but every square is not a rectangle.

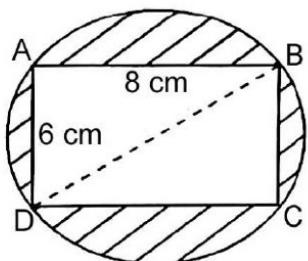
- A. Both A and B are true
 B. A is true and B is false
 C. A is false and B is true
 D. Both A and B are false

- 11.** Find the area of Rhombus ABCD having each side equal to 13 cm and one of its diagonal is 24 cm.



- A. 80 cm^2 B. 140 cm^2
 C. 100 cm^2 D. 120 cm^2

- 12.** A rectangle ABCD is inscribed in a circle having sides 8 cm and 6 cm. Find the area of the shaded region.



- A. 32 cm^2 B. 30.5 cm^2
 C. 40.5 cm^2 D. 36 cm^2

- 13.** Find m so that $(-5)^{m+1} \times (-5)^{m-1} = (-5)^3$.

- A. 1 B. 3
 C. 5 D. $\frac{3}{2}$

- 14.** The denominator of a rational number is greater than its numerator by 2. If the denominator is increased by 5 and the

numerator is decreased by 2, the number obtained is $\frac{1}{10}$. The rational number is:

- A. $\frac{25}{8}$ B. 3
 C. 1 D. $\frac{3}{5}$

- 15.** Which one of the following is a pythagorean triplet in which one side differs from the hypotenuse by two units?

- A. $(2n + 1, 4n, 2n^2 + 2n)$
 B. $(2n, 4n, n^2 + 1)$
 C. $(2n^2, 2n, 2n + 1)$
 D. $(2n, n^2 - 1, n^2 + 1)$

- 16.** The ratio of the circumference of 2 wheel is 5 : 3. Find the ratio of the radii of the 2 wheels.

- A. 5 : 3
 B. 3 : 5
 C. 9 : 10
 D. 10 : 9

- 17.** The following marks are obtained by a student in different subjects during formative assessment in 8 subjects. Find median.

7, 3, 8, 0, 9, 10, 8, 7

- A. 7.5 B. 9
 C. 6.5 D. 8, 7

- 18.** Factorize $4a^2 - 9b^2 - 2a - 3b$. Identify the correct factorize answer.

- A. $(2a - 3b)(2a - 3b - 1)$
 B. $(2a - 3b)(2a + 3b + 1)$
 C. $(2a + 3b)(2a + 3b + 1)$
 D. $(2a + 3b)(2a - 3b - 1)$

- 19.** $\sqrt[4]{\sqrt[3]{2^2}}$ is equal to:

- A. $2^{-\frac{1}{6}}$ B. $2^{\frac{1}{6}}$
 C. 2^{-6} D. 2^6

- 20.** There are 200 employees in an office. Food provision for them is for 20 days. How long will this provision last if 90 of them leave the group?

- A. 16 days B. 25 days
 C. 17 days D. 30 days

21. 5 pipes are required to fill a tank in 1 hour 36 minutes. How long will it take if 2 pipes stopped working?

- A. 57.40 minutes B. 2 hours
C. 48 minutes D. 2 hour 40 minutes

22. The Curved surface area of a cylindrical pipe is $2\pi(x^2 + x - 132)$ metres and its radius is $(x + 12)$ metres. What will be the height of the pipe?

- A. $(x + 12)$ sq. m B. $(x - 11)$ sq. m
C. $(x - 11)$ m D. $(x + 12)$ m

23. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|--------------------------------|-----------------------------|
| (a) $(7a + 6b)$ $(7a - 6b)$ | (i) $49a^2 + 84ab + 36b^2$ |
| (b) $(7a + 6b)^2$ | (ii) $49a^2 + 21ab - 18b^2$ |
| (c) $(7a - 6b)^2$ | (iii) $49a^2 - 36b^2$ |
| (d) $(7a + 6b)$ $(7a - 3b)$ | (iv) $49a^2 - 84ab + 36b^2$ |

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
A. (i) (ii) (iii) (iv)
B. (ii) (iii) (iv) (i)
C. (iii) (i) (iv) (ii)
D. (iv) (iii) (ii) (i)

24. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|------------------------|----------------|
| (a) $3m \times 2m$ | (i) $16a^2$ |
| (b) $-9m \times -3n$ | (ii) $6m^2$ |
| (c) $4a^2 \times 4a^2$ | (iii) $27mn$ |
| (d) $2a \times 8a$ | (iv) $16a^4$ |

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
A. (iv) (i) (ii) (iii)
B. (iii) (ii) (i) (iv)
C. (ii) (iii) (iv) (i)
D. (ii) (iii) (i) (iv)

25. If a 4-digit number $2xy8$ is exactly divisible by 3, then which of the following is the least value of $(x + y)$?

- A. 2 B. 4
C. 6 D. 5

26. Find the digits A and B if

$$\begin{array}{r} BA \\ \times A4 \\ \hline \end{array}$$

$$\begin{array}{r} 13A0 \\ \hline \end{array}$$

- A. 5, 4 B. 5, 2
C. 4, 5 D. 2, 5

27. One of the factors of $6x^2 + 5x - 6$ is:

- A. $2x - 3$ B. $3x + 2$
C. $2x + 3$ D. $2x - 2$

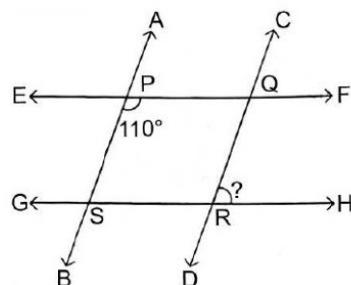
28. A tree broke at a height of 6 m from the ground and its top touched the ground at the distance of 8 m from the foot of the tree. Find the height of the tree.

- A. 10 m B. 14 m
C. 16 m D. 2 m

29. 15 boys earn ₹ 900 in 5 days. How much will 20 boys earn in 7 days?

- A. ₹ 1680 B. ₹ 1720
C. ₹ 1420 D. ₹ 2008

30. If $AB \parallel CD$ and $EF \parallel GH$ then find $\angle QRH$:



- A. 105° B. 50°
C. 110° D. 70°

31. In what time will ₹ 160000 amount to ₹ 176400 at 5% per annum compounded annually?

- A. 4 years B. 3 years
C. 2 years D. 1 year

32. Anita borrows ₹ 1000 at 10% p.a. simple interest for 3 years. She immediately lends this money at compound interest at the same rate and for the same time. What is her gain at the end of 3 years?

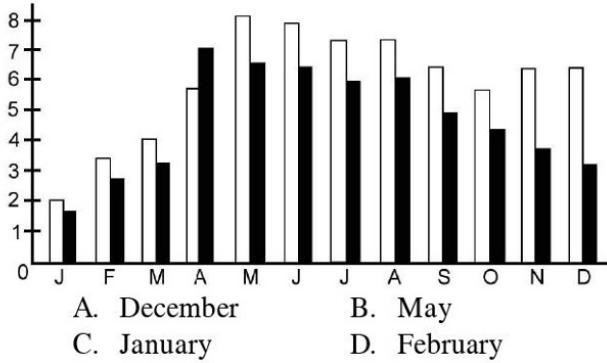
- A. ₹ 40 B. ₹ 41
C. ₹ 30 D. ₹ 31

33. Mohan can do a piece of work in 25 days alone and Rohan can finish it in 20 days. They work together for 5 days & then Mohan left the work. In how many days will Rohan finish the remaining work?

- A. 20 days B. 9 days
C. 14 days D. 11 days

34. The following bar graph shows the average daily hours of sunshine in two cities during the year. Observe the double bar graph and answer the following question.

In which months is the difference between average hours of sunshine of two cities least?



35. If one of the numbers of a Pythagorean triplet is 10, the triplet is:

- A. (23, 25, 10) B. (10, 24, 26)
C. (5, 8, 10) D. (3, 4, 10)

36. If one number is twice the other number and the sum of the squares of two numbers is 50,000, then find the difference of numbers.

- A. 10000 B. 50
C. 100 D. 10

37. Evaluate: $\sqrt[3]{1372} \times \sqrt[3]{1458}$.

- A. 126 B. 136
C. 116 D. 106

38. If $a = 12$, $b = -5$ and $c = -7$, then the value of $a^3 + b^3 + c^3$ is:

- A. 1360 B. 420
C. 1260 D. -1260

39. The value of a smart phone depreciates every year by 40%. Find out its value after 2 years if its present value is ₹ 70000.

- A. ₹ 28000 B. ₹ 16800
C. ₹ 25200 D. ₹ 35000

40. Which of the following cannot be true for a polyhedron?

- A. $V = 4$, $F = 4$, $E = 6$
B. $V = 6$, $F = 8$, $E = 12$
C. $V = 20$, $F = 12$, $E = 30$
D. $V = 4$, $F = 6$, $E = 6$

41. Consider the following distribution:

| Class | Frequency |
|----------|-----------|
| 0 – 20 | 17 |
| 20 – 40 | 28 |
| 40 – 60 | 32 |
| 60 – 80 | f |
| 80 – 100 | 19 |

If the mean of the above distribution is 50, what is the value of f ?

- A. 24 B. 34
C. 56 D. 96

42. The mean of 20 observations is 19. On checking it was found that the two observations were wrongly copied as 3 & 6. If wrong observations are replaced by correct values 8 and 9, then what is the correct mean?

- A. 19.4 B. 16.6
C. 15.8 D. 14.2

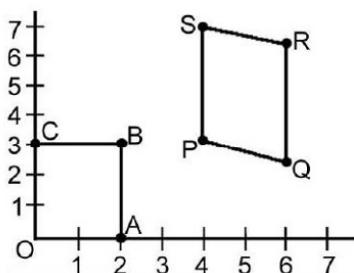
43. A person has 2 bags. First bag has 3 black and 4 white balls. Second bag has 4 black and 3 white balls. A bag is selected at random and then a ball is selected from it. Find the probability of the ball to be black.

- A. $\frac{1}{3}$ B. $\frac{1}{4}$
C. $\frac{1}{7}$ D. $\frac{1}{2}$

44. What is the probability that the number selected from the numbers, 1, 2, 3, ..., 30 is a prime number.

- A. $\frac{1}{29}$ B. $\frac{5}{6}$
 C. $\frac{1}{3}$ D. $\frac{2}{3}$

45. Identify the correct coordinate of the vertices of rectangle OABC from the adjoining figure.



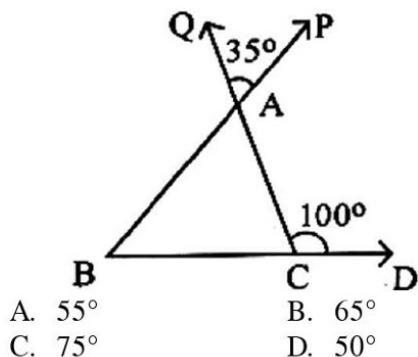
- A. O(0, 0), A(2, 0), B(2, 3), C(0, 3)
 B. P(4, 3), Q(6, 1), R(6, 5), S(4, 7)
 C. O(0, 0), A(0, 2), B(3, 2), C(3, 0)
 D. O(1, 1), A(0, 2), B(2, 3), C(3, 3)

46. A cistern can be filled by one tap in 4 hours and by another tap in 3 hours. How long will it take to fill it, if both taps are opened together?

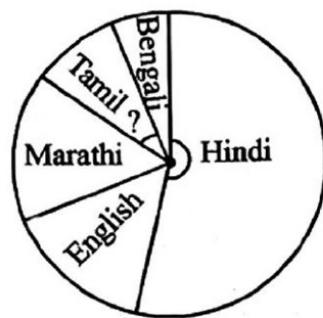
- A. $\frac{11}{7}$ hours B. $\frac{12}{7}$ hours
 C. $\frac{7}{12}$ hours D. $\frac{7}{11}$ hours

47. Choose the correct remainder when $p(x) : 3x^2 + 4x + 5$ is divided by $g(x) : x - 2$:
 A. 20 B. 25
 C. 30 D. 35

48. In the Fig. $\angle QAP = 35^\circ$ and $\angle ACD = 100^\circ$. Find $\angle ABC$:



49. In India people speak different languages. Choose the correct option in degrees which represent the number of people speaking Tamil using the information given in the chart.



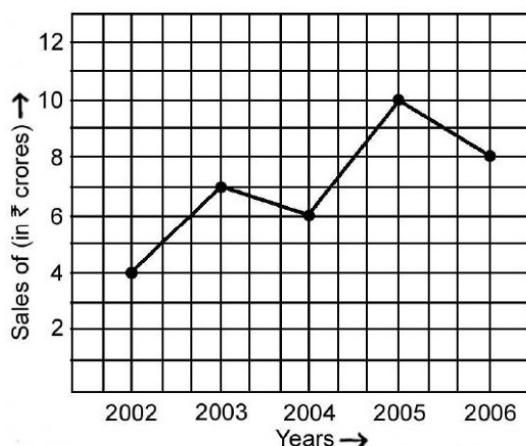
Language Number of People

| | |
|---------------|-----------|
| (i) Hindi | 40 |
| (ii) English | 12 |
| (iii) Marathi | 9 |
| (iv) Tamil | 7 |
| (v) Bengali | 4 |
| Total | 72 |

- A. 45° B. 35°
 C. 20° D. 60°

50. The following line graph shows the yearly sales figures for a manufacturing company. Study the line graph and answer the following question.

The average sales of the company of the even years will be:



- A. 7 B. 8.5
 C. 6 D. 18

Section B : English

51. Choose the correct option that has the right rearrangement of words to make a meaningful sentence.

- | | |
|---------------|-----------------|
| (a) butter | (b) is a |
| (c) bread and | (d) combination |
| (e) tempting | |

Choose the correct answer from the options given below:

- A. (d), (a), (e), (c), (b)
- B. (a), (b), (d), (c), (e)
- C. (c), (a), (b), (e), (d)
- D. (a), (b), (e), (c), (d)

52. Choose the correct option that has the right rearrangement of words to make a meaningful sentence.

- | | |
|------------------|----------------|
| (a) is important | (b) rules |
| (c) it | (d) to observe |
| (e) traffic | |

Choose the correct answer from the options given below:

- A. (c), (a), (d), (e), (b)
- B. (d), (a), (b), (c), (e)
- C. (e), (b), (a), (c), (d)
- D. (a), (b), (c), (e), (d)

53. Choose the correct option to fill in the blanks.

The patient was _____ weak to walk without help.

- | | |
|---------|-----------|
| A. too | B. little |
| C. much | D. few |

54. Choose the correct preposition:

Are you looking for anything _____ particular?

- | | |
|----------|----------|
| A. over | B. among |
| C. above | D. in |

55. Match the following books/poems with their authors/poets:

| <i>Books/Poems</i> | <i>Authors/Poets</i> |
|-----------------------|-----------------------------|
| (a) Treasure Island | (i) Major H.P.S. Ahluwalia |
| (b) Swami and Friends | (ii) Robert Louis Stevenson |

- | | |
|-----------------------|--------------------|
| (c) Harry Potter | (iii) R.K. Narayan |
| (d) The Summit Within | (iv) J.K. Rowling |

Choose the correct answer from the options given below:

- | | | | |
|----------|-------|------|-------|
| (a) | (b) | (c) | (d) |
| A. (iii) | (iv) | (i) | (ii) |
| B. (ii) | (iii) | (iv) | (i) |
| C. (i) | (ii) | (iv) | (iii) |
| D. (iii) | (i) | (iv) | (ii) |

56. Choose the correct option:

The mason is building the wall.

The above sentence would be written in passive form as:

- A. The wall are being built by the mason.
- B. The wall is being built by the mason.
- C. The mason is being built by the wall.
- D. The wall was being built by the mason.

57. Choose the correct option.

- His _____ is in the ascendant.
- A. galaxy
 - B. universe
 - C. star
 - D. luckily

58. Identify the error and choose the correct option.

Energy is very essential in succeed in life.

- A. in-to
- B. is-was
- C. in-for
- D. is-were

59. Choose the correct option:

- Ramesh and his brother _____ dancing.
- A. was
 - B. were
 - C. will
 - D. would

60. Choose the correct option and fill in the blanks:

My sister said, "You lied to me yesterday."

My sister said that _____ to her _____.

- A. you had lied, yesterday
- B. I had lied, yesterday
- C. I had lied, the previous day
- D. you had lied, the previous day

61. Identify the subject in the following sentence:

The Board of Directors has arrived.

- A. The Board
- B. The Board of Directors
- C. Directors
- D. The Board of

62. Choose the correct option:

Sam is a _____ man.

- A. first
- B. handsome
- C. half
- D. delicious

63. Choose the correct option to fill in the blank:

The _____ man died in the hospital.

- A. injury
- B. injure
- C. to injure
- D. injured

64. Identify the positive degree from the following options:

- A. Hottest
- B. Hot
- C. Hotter
- D. Hotters

65. Choose the correct option to complete the following sentence:

Did _____ see her paintings?

- A. her
- B. them
- C. you
- D. him

Directions (Qs. Nos. 66-70): Read the passage given below:

Valentin Hauy developed a system of reading for the blind. He printed normal letters in relief that could be felt by a touch of finger. He also started a school for the blind children. Hauy's system of reading for the blind was very useful. But it was quite difficult to learn. Moreover, it was only a reading system. There was no way for the blind to write in this system. In 1819, a ten-year-old blind boy named Louis Braille entered Hauy's school. He was an intelligent student and quickly learnt to read with the help of embossed letters. But he soon realised the disadvantages in Hauy's system. He made up his mind to develop an easier method of reading and writing for the blind. And in 1824, when he was only 15, Braille invented a system of writing which has been accepted all over the world.

He was yet a student in Hauy's school. This school is now known as the National Institute for Blind Children. It is supported by the French government.

On the basis of your understanding of the passage, answer the following questions:

66. What according to the passage was the major disadvantage in Hauy's system?

- A. It was difficult to comprehend.
- B. Hauy's system was difficult for the blind to use for writing.
- C. It was easy to learn.
- D. It was a regular reading and writing system.

67. What according to you is Louis Braille known for?

- A. A blind boy
- B. A general student in Hauy's school
- C. The inventor of a system of reading and writing for the blind
- D. A ten year old boy

68. He printed letters in relief.

Here the word – 'relief' means _____.

- A. engraved
- B. in a depressed form
- C. normal form
- D. in a raised form

69. Give the synonym of the word – 'invent'.

- A. create
- B. realize
- C. discover
- D. unearth

70. Give the antonym of the word – 'develop'.

- A. grow
- B. decline
- C. overweight
- D. ripe

71. Choose the correct option:

The synonym of 'take' is _____.

- A. except
- B. accept
- C. ignore
- D. refuse

72. Choose the correct option:

The antonym of 'Stiff' is _____.

- A. bland
- B. dark
- C. limp
- D. bright

73. Choose the correct option to fill in the blank:

They aren't good scuba divers, _____?

- A. could they? B. are they?
 C. can they? D. will they?

- 74.** Which of the following is an assertive sentence?
 A. Do you enjoy Idli Sambhar?
 B. You are requested to stand in line.
 C. The Taj is a beautiful monument.
 D. Hurrah ! the school team has won the match.

- 75.** Match the poems/books with poets/authors:

| <i>Poems/Books</i> | <i>Poets/Authors</i> |
|--------------------|-------------------------|
| (a) Vocation | (i) Rabindranath Tagore |

- (b) Christmas Carol (ii) Jawaharlal Nehru
 (c) Geography Lesson (iii) Charles Dickens
 (d) Discovery of India (iv) Zulfikar Ghose

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
 A. (iii) (iv) (i) (ii)
 B. (iv) (i) (ii) (iii)
 C. (ii) (iv) (iii) (i)
 D. (i) (iii) (iv) (ii)

Section C : General Science

- 76.** Identify the correct sequence of process that results in lightning:

- (a) Magnitude of accumulated charge becomes large
 (b) Accumulation of negative charge near the lower edges of cloud.
 (c) Air becomes conductor of charges
 (d) Accumulation of positive charge near the upper edges of cloud.
 (e) Negative and positive charge meet producing streaks of bright light and sound called as lightning.

Choose the correct answer from the options given below:

- A. (a), (c), (b), (d), (e)
 B. (d), (b), (c), (a), (e)
 C. (d), (b), (a), (c), (e)
 D. (a), (c), (b), (d), (e)

- 77.** The calorific value of a fuel is expressed in the unit:

- A. g/J B. kg/J
 C. kJ/kg D. J/g

- 78.** To electroplate silver (Ag) on a metal object, what will you choose as cathode, anode and electrolyte?

- A. Cathode – metal object, Anode – silver bar, Electrolyte – copper salt

- B. Cathode – silver bar, Anode – metal object, Electrolyte – silver salt
 C. Cathode – metal object, Anode – silver bar, Electrolyte – silver salt
 D. Cathode – copper rod, Anode – silver bar, Electrolyte – copper salt

- 79.** Rashi was unable to hold the greasy tumbler of milk in her hand. It would be because:

- A. Greasing has made the surface smooth, increasing the friction
 B. Greasing has made the surface rough, decreasing the friction
 C. Greasing has made the surface smooth, reducing the friction
 D. Greasing has made the surface rough, increasing the friction

- 80.** ‘Combine’ is a machine. Identify from the following for which it is used?

- A. For harvesting and threshing
 B. For sowing and harvesting
 C. For threshing and sowing
 D. For irrigation and sowing

- 81.** Tadpole develops into an adult frog by the process of:

- A. Fertilisation B. Metamorphosis
 C. Budding D. Adaptation

82. Force acting opposite to the direction of motion of a body is:

- A. Gravitational Force
- B. Electrical Force
- C. Friction Force
- D. Atmospheric Pressure

83. Human ears are sensory organs that help to hear sound. Its outer portion can be seen. The rest of the delicate ear is buried deep inside the skull. Identify the correct sequence from Outer ear to Inner ear:

- (a) Auditory Nerve
- (b) Ear drum
- (c) Pinna
- (d) Ear tube
- (e) INNER EAR

Choose the correct answer from the options given below:

- A. (c), (d), (b), (e), (a)
- B. (b), (c), (d), (e), (a)
- C. (a), (b), (c), (d), (e)
- D. (d), (e), (a), (b), (c)

84. Match List-I with List-II:

| | <i>List-I</i> | <i>List-II</i> |
|-----------------------|---------------|--|
| (a) Braille | (i) | Splitting of white light into seven colours |
| (b) Kaleidoscope | (ii) | Left of the object appears right and right appears left |
| (c) Dispersion | (iii) | Resource for visually (Blind) challenged person |
| (d) Lateral inversion | (iv) | Beautiful patterns are formed because of multiple reflection |

Choose the correct answer from the options given below:

- | | | | | |
|----|-------|------|-------|------|
| | (a) | (b) | (c) | (d) |
| A. | (i) | (iv) | (iii) | (ii) |
| B. | (i) | (ii) | (iii) | (iv) |
| C. | (iii) | (iv) | (i) | (ii) |
| D. | (iv) | (ii) | (iii) | (i) |

85. Which of the following statements is incorrect for CNG?

- A. It can be easily transported through pipes.
- B. It is more polluting.
- C. It is stored under high pressure.
- D. It is used as fuel for transport vehicles.

86. Amish has to demonstrate a Science Activity on Ignition temperature from the objects given to him like paper sheets, candle, matchbox and water. The correct sequence for the activity to work will be:

- (a) Light the candle.
- (b) Pour the water in one of the cups.
- (c) Continue heating both the cups.
- (d) Make two paper cups by folding a sheet of paper.
- (e) Heat both the cups separately with a candle.

Choose the correct answer from the options given below:

- A. (d), (c), (b), (e), (a)
- B. (d), (b), (e), (a), (c)
- C. (d), (b), (a), (e), (c)
- D. (b), (d), (e), (a), (c)

87. Match List-I with List-II:

| | <i>List-I</i> | <i>List-II</i> |
|-------------------|--------------------------|--|
| | <i>(Cell organelles)</i> | <i>(Function)</i> |
| (a) Nucleus | (i) | Contains cell organelles |
| (b) Cell membrane | (ii) | Control centre of all activities of cell |
| (c) Chromosomes | (iii) | Transfer of characters |
| (d) Cytoplasm | (iv) | Provide shape and protection |

Choose the correct answer from the options given below:

- | | | | | |
|----|-------|-------|-------|------|
| | (a) | (b) | (c) | (d) |
| A. | (ii) | (iv) | (iii) | (i) |
| B. | (i) | (ii) | (iii) | (iv) |
| C. | (iii) | (iv) | (ii) | (i) |
| D. | (iv) | (iii) | (ii) | (i) |

- 88.** Identify the name of a book carrying information about endangered species from the following:
- Red Data Book
 - Record Data Book
 - Record Book
 - Observation Book
- 89.** Identify the traditional methods of Irrigation:
- Chain pump
 - Lever system
 - Sprinkler system
 - Drip system
- Both (a) and (c)
 - Both (a) and (b)
 - Both (c) and (d)
 - Both (d) and (a)
- 90.** Name a National Park situated in Pachmarhi Biosphere Reserve from the following:
- Satpura National Park
 - Bori National Park
 - Jim Corbett National Park
 - Tawa National Park
- 91.** Ankush has just entered his adolescence years. He wishes to know what should be eaten to remain healthy. Which of the following set of food should he consume to remain fit and healthy?
- Milk, rice, dal, leafy, vegetables
 - Chips, leafy vegetables, milk, burger
 - Milk, dal, leafy vegetables, fried snacks
 - Dal, rice, burger, chips
- 92.** At puberty which hormone is secreted by ovaries?
- Estrogen
 - Growth hormone
 - Testosterone
 - Insulin
- 93.** Metamorphosis in frog is controlled by this hormone:
- Insulin
 - Thyroxine
 - Estrogen
 - Adrenaline
- 94.** Choose the feasible displacement reaction from the options given below:
- Copper sulphate + Zinc granules
 - Iron sulphate + Copper turnings
 - Zinc sulphate + Iron nails
 - Zinc sulphate + Copper turnings
- 95.** Plastic containers or boxes are mostly preferred to store food items because these are:
- non biodegradable
 - non reactive
 - poor conductor of heat and electricity
 - more expensive
- 96.** If current is passed through copper sulphate solution copper gets deposited on the plate connected to:
- positive terminal of battery
 - negative terminal of battery
 - when battery is not connected
 - copper deposited on both plates
- 97.** ISRO stands for:
- Indian Science Research Organisation
 - International Science Research Organisation
 - Indian Space Research Organisation
 - Interstate Research Organisation
- 98.** Identify which is not a water pollutant from the following:
- Sewage
 - Algae
 - Fertilisers
 - Weedicides
- 99.** Which of these gases are responsible for global warming?
- CO_2 , methane and water vapour
 - CO_2 , sulphur dioxide, water vapour
 - CO , CO_2 and water vapour
 - CO_2 , ozone and methane
- 100.** The bread or idli dough becomes fluffy because of:
- Heat
 - Grinding
 - Growth of yeast cells
 - Kneading

Section D : Social Studies

- 101.** The neighbourhood markets are the ones which _____.
 A. are far from our house
 B. are very expensive
 C. provide all necessary items
 D. provide less items

102. The source of fresh water available for human use is:
 A. Rivers B. Rain
 C. Drains D. Water vapour

103. The Khilafat Movement was led by whom, from the following?
 A. Mahatma Gandhi
 B. Mohammad Ali and Shaukat Ali
 C. C.R. Das
 D. Mahamud Ali

104. The Veda Samaj established in Madras in 1864 worked for which of the following causes?
 A. Promotion of man
 B. To abolish caste distinctions and for improving the conditions of women
 C. Poor people
 D. Against child marriage

105. The Ladakh desert is mainly inhabited by:
 A. Christians and Muslims
 B. Buddhists and Muslims
 C. Christians and Buddhists
 D. Only Buddhists

106. From the following options, choose which is not true about the Internet?
 A. Provides worldwide information
 B. Provides interaction
 C. Allows moving physically from one place to another
 D. Enhances E-Commerce

107. From the following, choose the region that is known as ‘Orchards of the World’.
 A. Coniferous region
 B. Tropical region
 C. Mediterranean region
 D. Temperate region

108. Sandstone is an example of _____ rock.
 A. Igneous
 B. Metamorphic
 C. Sedimentary
 D. Extrusive igneous rock

109. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|--------------------------------|---|
| (a) Right to Equality | (i) Prohibits human trafficking |
| (b) Right to Freedom | (ii) Equal before law |
| (c) Right to Freedom | (iii) The right to form of Religion associations |
| (d) Right against Exploitation | (iv) The right to practise any religion of their choice |

Choose the correct answer from the options given below:

| | | | |
|----------|-------|-------|------|
| (a) | (b) | (c) | (d) |
| A. (iii) | (i) | (iv) | (ii) |
| B. (ii) | (iii) | (iv) | (i) |
| C. (i) | (ii) | (iii) | (iv) |
| D. (iv) | (iii) | (ii) | (i) |

110. Identify the crop which is not classified as a plantation crop?
 A. Rice B. Tea
 C. Sugarcane D. Cashew

111. Who founded the “Brahmo Samaj”?
 A. Dayanand Saraswati
 B. Raja Rammohan Roy
 C. Ishwar Chandra Vidyasagar
 D. Pandita Ramabai

112. Choose the correct meaning of ‘Patent’.
 A. It means adding the value of any commodity.
 B. It means enhancing the usability of any thing.
 C. It means reducing cost of production.
 D. It means the exclusive right over any idea or invention.

113. Who am I?

I am founder of Sur dynasty.

- A. Humayun
- B. Sher Shah
- C. Alauddin
- D. Genghis Khan

114. Identify the source of funds for the Gram Panchayats.

- A. Income tax
- B. Government school's fee
- C. Taxes on national highways
- D. Taxes on houses, market places etc.

115. Choose the landform, which is not formed by the river?

- | | |
|-------------|-----------|
| A. Ox-bow | B. Levees |
| C. Meanders | D. Loess |

116. Iron made from iron ore is the product of _____.

- A. Marine industry
- B. Mineral based industry
- C. Agro based industry
- D. Forest based industry

117. When and to whom the British Parliament transferred their powers in order to ensure a more responsible management of Indian affairs?

- A. 1857, East India Company
- B. 1859, Lawrence – The Viceroy
- C. 1858, Governor General with the title of Viceroy
- D. 1887, Dinshaw Wacha

118. Which Article of the Constitution of India provides every citizen the Fundamental Right to life including the Right to health?

- A. Article 15
- B. Article 360
- C. Article 12
- D. Article 21

119. Choose the meaning of the word Metamorphic from the following:

- A. Fire
- B. Settle down
- C. Change of form
- D. Air

120. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|----------------------------|-------------------------|
| (a) The Brahmo Samaj | (i) Jyotirao Phule |
| (b) The Ramkrishna Mission | (ii) Swami Dayanand |
| (c) Gulamgiri | (iii) Raja Rammohan Roy |
| (d) Arya Samaj | (iv) Swami Vivekananda |

Choose the correct answer from the options given below:

- | | | | |
|----------|-------|-------|-------|
| (a) | (b) | (c) | (d) |
| A. (iii) | (iv) | (i) | (ii) |
| B. (iv) | (iii) | (ii) | (i) |
| C. (iv) | (i) | (ii) | (iii) |
| D. (iv) | (i) | (iii) | (ii) |

121. Choose the correct definition of 'birth rate' from the following options:

- A. The number of births per year
- B. The change in total population during a specific time
- C. The number of live births per 1,000 people
- D. The number of live births per year, per 10,000 people

122. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|---------------------------|--|
| (a) Intensive subsistence | (i) Slash and burn |
| (b) Shifting cultivation | (ii) Amount of capital use is large |
| (c) Nomadic herding | (iii) Prevalent in the thickly populated areas |
| (d) Commercial farming | (iv) Move from place to place with their animals |

Choose the correct answer from the options given below:

- | | | | |
|----------|-------|------|-------|
| (a) | (b) | (c) | (d) |
| A. (i) | (ii) | (iv) | (iii) |
| B. (iii) | (i) | (iv) | (ii) |
| C. (ii) | (iii) | (i) | (iv) |
| D. (iv) | (i) | (ii) | (iii) |

123. Which of the following is a public sector company?

- A. Maruti Suzuki India Limited
- B. Anand Milk Union Limited
- C. Steel Authority of India Limited
- D. Pesticide Factory of Union Carbide

124. Arrange in chronological order:

- (a) Tughlaq Dynasty
- (b) Early Turkish
- (c) Khalji Dynasty
- (d) Rajput Dynasty
- (e) Lodi Dynasty

Choose the correct answer from the options given below:

- A. (d), (c), (a), (e), (b)
- B. (d), (b), (c), (a), (e)

- C. (c), (a), (b), (e), (d)

- D. (b), (d), (c), (e), (a)

125. Match List-I with List-II:

| <i>List-I</i> | <i>List-II</i> |
|-------------------------|-------------------------|
| (a) Khilafat Agitation | (i) Mohammad Ali Jinnah |
| (b) Rowlatt Act | (ii) Viceroy Curzon |
| (c) Salt March | (iii) Shaikat Ali |
| (d) Partition of Bengal | (iv) Mahatma Gandhi |

Choose the correct answer from the options given below:

- | | | | |
|----------|-------|------|-------|
| (a) | (b) | (c) | (d) |
| A. (iv) | (i) | (ii) | (iii) |
| B. (iii) | (i) | (iv) | (ii) |
| C. (ii) | (iii) | (i) | (iv) |
| D. (iii) | (iv) | (ii) | (i) |

Section E : Intelligence

126. $\frac{2}{5} : \frac{8}{25} :: \frac{11}{15} : \underline{\hspace{2cm}}$.

- | | |
|-----------------------|-----------------------|
| A. $\frac{1331}{225}$ | B. $\frac{121}{3375}$ |
| C. $\frac{111}{155}$ | D. $\frac{128}{55}$ |

127. If word MATH is coded as 26, 2, 40, 16, then code for the word BOOK is:

- A. 2, 15, 15, 11 B. 10, 20, 20, 44
- C. 4, 30, 30, 22 D. 1, 12, 12, 14

128. A, B, C, D are four friends. A is shorter than B but taller than C who is shorter than D. Who is shortest among all:

- A. A B. B
- C. C D. D

129. Choose the correct alternative from the given options:

If 8th of April falls on Monday, what Day would be the 30th May of that year?

- A. Sunday B. Monday
- C. Tuesday D. Wednesday

130. If the English alphabets are divided into two equal halves from A to M and N to Z such as A corresponds to N, then which letter in the later half would be corresponding to letter K.

- A. X B. Y
- C. Z D. W

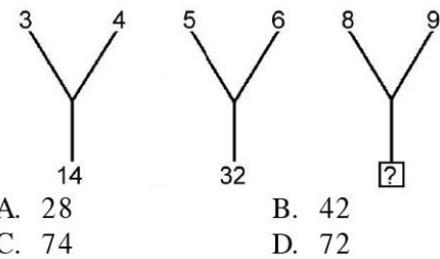
131. Arrange the given response in meaningful sequence:

- (a) Leaf
- (b) Fruit
- (c) Stem
- (d) Root
- (e) Flower

Choose the correct answer from the options given below:

- A. (c), (d), (a), (e), (b)
- B. (d), (c), (e), (a), (b)
- C. (c), (d), (e), (a), (b)
- D. (d), (c), (a), (e), (b)

132. Choose the option that will replace question mark (?) in the following:



133. Find the odd one out.

- A. Alphonso B. Kesar
C. Malgova D. Sherbati

134. Find the odd one out.

- A. Rhombus B. Square
C. Rectangle D. Kite

135. Choose the odd one out.

- A. Scissors B. Knife
C. Axe D. Hammer

136. Complete the analogy

$$36 : 225 :: 1225 : \underline{\hspace{1cm}}$$

- A. 7929 B. 6929
C. 5929 D. 4929

137. Find the missing number, which has same relationship with the other number on the basis of the relation between the numbers in the given pair.

$$16 : 41 :: 20 : \underline{\hspace{1cm}}$$

- A. 71 B. 53
C. 44 D. 67

138. Complete the analogy.

$$\text{Thermometer} : \text{Temperature} :: \underline{\hspace{1cm}} : \text{Current}$$

- A. Ammeter B. Voltmeter
C. Anemometer D. Barometer

139. Arrange the given words in the sequence in which they occur in the dictionary.

- (a) Aaerstd (b) Aaersted
(c) Amquarine (d) Acgledhi
(e) Acgledih

Choose the correct answer from the options given below:

- A. (a), (b), (c), (d), (e)
B. (a), (b), (d), (c), (e)
C. (a), (b), (d), (e), (c)
D. (a), (b), (c), (e), (d)

140. Find the missing word, which has the same relationship with the other word as that between words of different pair.

Pie : Cake :: π : _____

- A. Pasta B. Pastry
C. Mathematics D. Noodles

141. Complete the analogy.

Work : Joule :: _____ : Watt.

- A. Volume B. Area
C. Time D. Power

142. Complete the analogy.

Chennai : Tamil Nadu :: Kohima : _____.

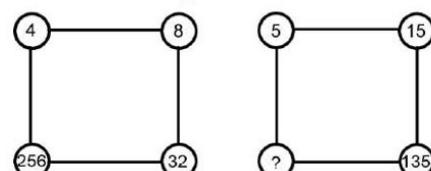
- A. Nagaland B. Gujarat
C. Orissa D. Meghalaya

143. Choose the odd one out.

ZXV, LJH, IGE, UTR, PNL

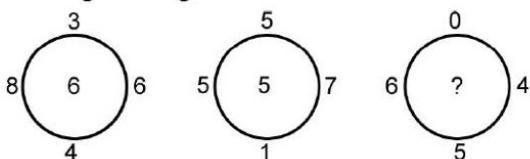
- A. PNL B. IGE
C. UTR D. ZXV

144. Find the missing number:



- A. 3800 B. 3635
C. 3435 D. 3400

145. Find the missing term out of the options given below after studying the relationship among the given figures.



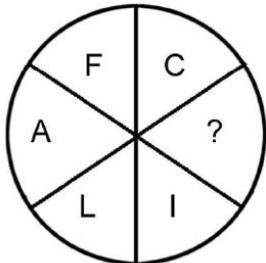
- A. 7 B. 6
C. 4 D. 5

146. Decipher the pattern (study the pattern and fill in the blank)

| | | |
|----|----|---|
| 5 | 40 | 7 |
| 11 | 77 | 6 |
| 3 | ? | 9 |

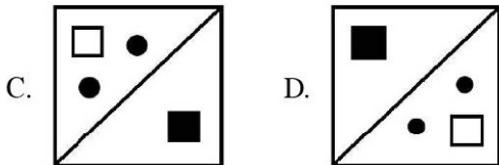
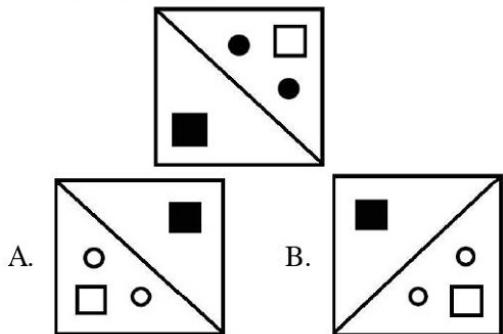
- A. 29 B. 43
C. 52 D. 30

147. Which letter will come in the place of '?'



- A. M B. N
C. O D. P

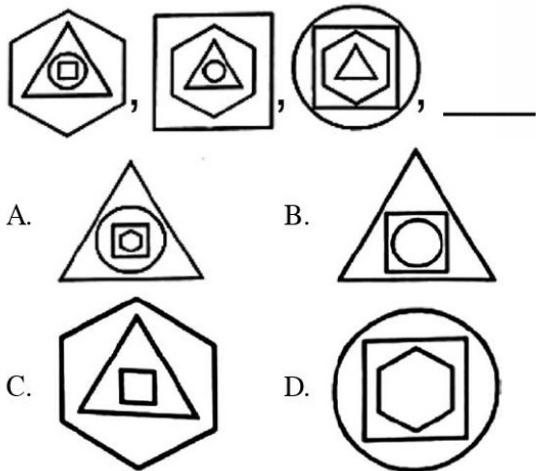
148. Which of the following is the water image of the given figure?



149. Identify the correct mirror image of word $\overset{x}{\underset{Y}{\leftrightarrow}}$ BLINK along the line XY.

- A. KNLB B. BLINK
C. BLINK D. KNILB

150. Find the next pattern in the sequence.



ANSWERS

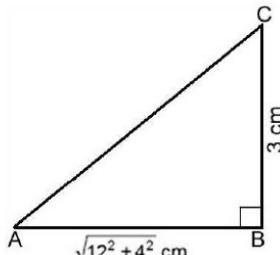
1. (B): Loss% = $\frac{1}{6} \times 100 = \frac{50}{3}\%$.

2. (C): $xy^2m = (2xy + 5y)^2 - (2xy - 5y)^2$
 $= (2xy + 5y + 2xy - 5y)(2xy + 5y - 2xy + 5y)$
 $= (4xy)(10y)$
 $\Rightarrow xy^2m = 40xy^2$
 $\Rightarrow m = 40.$

3. (D): $84xy^2z^2$

Hence, like term of $84xy^2z^2$
 $= 6 \times 4 \times x \times z \times y \times z \times y$
 $= 24xy^2z^2.$

4. (A): $(AC)^2 = (3)^2 + (\sqrt{12^2 + 4^2})^2$



$$= 9 + 144 + 16 = 169 = (13)^2$$

$$\therefore AC = 13 \text{ cm}$$

Perimeter of the given figure

$$= (4\sqrt{10} + 16) \text{ cm.}$$

5. (D): $\because 1000 \text{ revolutions} = 2000 \text{ m}$

$$\Rightarrow 1 \text{ revolution} = 2 \text{ m}$$

$$C = 2\pi r$$

$$\Rightarrow 2 = 2 \times \frac{22}{7} \times r$$

$$\Rightarrow r = \frac{7}{22} = 0.318 \text{ m}$$

Hence, the diameter of the wheel = 0.636 m.

6. (D): $\because a = 5 + 2\sqrt{6}$

$$\therefore \frac{1}{a} = \frac{1}{5+2\sqrt{6}} \times \frac{5-2\sqrt{6}}{5-2\sqrt{6}}$$

$$= \frac{5-2\sqrt{6}}{1}$$

$$a + b = 5 + 2\sqrt{6} + 5 - 2\sqrt{6} = 10$$

Squaring both sides, then we get

$$a^2 + b^2 + 2ab = 100$$

$$\Rightarrow a^2 + b^2 + 2(5+2\sqrt{6})(5-2\sqrt{6}) = 100$$

$$\Rightarrow a^2 + b^2 + 2 \times (25 - 24) = 100$$

$$\therefore a^2 + b^2 = 100 - 2 = 98$$

Hence, the value of $a^2 + b^2 = 98$.

7. (A): According to the question

$$3(290 - x) = (150 + x)$$

$$\Rightarrow 870 - 3x = 150 + x$$

$$\Rightarrow 870 - 150 = 4x$$

$$\Rightarrow 720 = 4x$$

$$\therefore x = \frac{720}{4} = 180$$

Hence, required no. of cards given by Gauransh to Tanya = 180.

8. (D): Let present age of B = x years

and Present age of A = $2x$ years

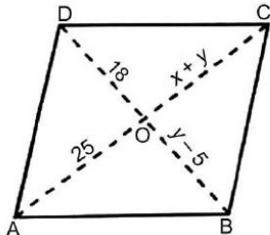
5 years ago, B's age = $(x - 5)$

According to the question,

$$x - 5 = b \Rightarrow x = b + 5$$

$$\therefore \text{Present age of A} = 2x = 2(b + 5) \\ = 2b + 10.$$

9. (B):



\because Diagonals of || gm bisect each other.

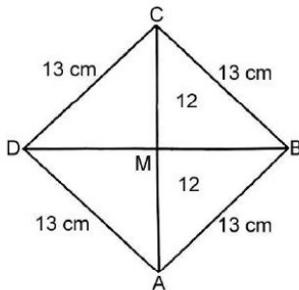
$$\therefore y - 5 = 18 \Rightarrow y = 23$$

$$\text{and } x + y = 25 \Rightarrow x = 25 - 23 = 2$$

$$\text{Hence, } x = 2, y = 23.$$

10. (D)

11. (D):



In $\triangle ADM$,

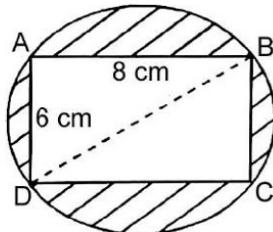
$$DM^2 = (13)^2 - (12)^2 \\ = 169 - 144 = 25$$

$$\therefore DM = 5 \text{ cm}$$

$$DB = 2 \times 5 = 10 \text{ cm}$$

$$\begin{aligned} \text{Area of rhombus} &= \frac{1}{2} \times d_1 \times d_2 \\ &= \frac{1}{2} \times 24 \times 10 = 120 \text{ cm}^2. \end{aligned}$$

12. (B):



$$BD^2 = 8^2 + 6^2 = 64 + 36 = 100$$

$$\therefore BD = 10 \text{ cm}$$

$$\therefore \text{radius of circle} = 5 \text{ cm}$$

$$\text{Area of rectangle} = 8 \times 6 = 48 \text{ cm}^2$$

$$\begin{aligned} \text{Area of shaded region} &= \text{Area of circle} \\ &\quad - \text{Area of rectangle} \end{aligned}$$

$$= \frac{22}{7} \times 5 \times 5 - 48$$

$$= \frac{550}{7} - 48$$

$$= \frac{550 - 336}{7} = \frac{214}{7}$$

$$= 30.5 \text{ cm}^2.$$

13. (D): $(-5)^{m+1} \times (-5)^{m-1} = (-5)^3$
 $\Rightarrow (-5)^{m+1+m-1} = (-5)^3$

$$\Rightarrow 2m = 3 \Rightarrow m = \frac{3}{2}$$

14. (D): Let numerator = x
 \therefore Denominator = $x + 2$

$$\therefore \text{Fraction} = \frac{x}{x+2}$$

According to the question

$$\frac{x-2}{x+2+5} = \frac{1}{10}$$

$$\Rightarrow \frac{x-2}{x+7} = \frac{1}{10}$$

$$\Rightarrow 10x - 20 = x + 7$$

$$\Rightarrow 9x = 27 \Rightarrow x = 3$$

$$\therefore \text{Fraction} = \frac{3}{5}.$$

15. (D): $(n^2 + 1)^2 = (2n)^2 + (n^2 - 1)^2$
 $\Rightarrow n^4 + 2n^2 + 1 = 4n^2 + n^4 - 2n^2 + 1$
 $= n^4 + 2n^2 + 1$

Hence, $(2n, n^2 - 1, n^2 + 1)$ is a pythagorean triplet.

16. (A): $\frac{C_1}{C_2} = \frac{2\pi r_1}{2\pi r_2}$

$$\Rightarrow \frac{5}{3} = \frac{r_1}{r_2}$$

Hence, $r_1 : r_2 = 5 : 3$.

17. (A): First write in ascending order
 0, 3, 7, 7, 8, 8, 9, 10

Here $n = 8$ which is even number

$$\therefore \text{Median} = \frac{\text{4th term} + \text{5th term}}{2}$$

$$= \frac{7+8}{2} = \frac{15}{2} = 7.5.$$

18. (D): $4a^2 - 9b^2 - 2a - 3b$
 $= (2a)^2 - (3b)^2 - 1(2a + 3b)$
 $= (2a + 3b)(2a - 3b) - 1(2a + 3b)$
 $= (2a + 3b)(2a - 3b - 1).$

19. (B): $\sqrt[4]{3\sqrt{2^2}} = 2^{\frac{2}{12}} = 2^{\frac{1}{6}}$

20. (*)

21. (D): Here, 1 hour 36 minutes = $1\frac{36}{60}$ hr.

$$= 1\frac{3}{5} = \frac{8}{5} \text{ hr.}$$

given, 2 pipes stopped working

\therefore remaining pipes = $5 - 2 = 3$ pipes

\therefore 5 pipes fill a tank in $\frac{8}{5}$ hr.

\therefore 5 pipes' 1 hour's work = $\frac{5}{8}$

\therefore 1 pipe's 1 hour's work = $\frac{5}{8} \times \frac{1}{5} = \frac{1}{8}$

\therefore 3 pipes' 1 hour's work = $\frac{3}{8}$

Hence, 3 pipes fill a tank in $\frac{8}{3}$ hours

$$= 2\frac{2}{3} \text{ hours}$$

$$= 2 \text{ hour } \frac{2}{3} \times 60 \text{ min.}$$

$$= 2 \text{ hour } 40 \text{ minutes}$$

22. (C): The curved surface area of a cylindrical pipes

$$= 2\pi(x^2 + x - 132)$$

$$= 2\pi(x^2 + 12x - 11x - 132)$$

$$= 2\pi[x(x+12) - 11(x+12)]$$

$$= 2\pi(x-11)(x+12)$$

$$\Rightarrow 2\pi rh = 2\pi(x-11)(x+12)$$

$$\Rightarrow 2\pi(x+12)h = 2\pi(x-11)(x+12)$$

$$\Rightarrow h = (x-11) \text{ m.}$$

23. (C): (A) $(7x + 6b)(7a - 6b)$
 $= (\text{III}) 49a^2 - 36b^2$

(B) $(7a + 6b)^2$

$$= (\text{I}) 49a^2 + 84ab + 36b^2$$

(C) $(7a - 6b)^2$

$$= (\text{IV}) 49a^2 - 84ab + 36b^2$$

$$\begin{aligned} & \text{(D)} (7a + 6b)(7a - 3b) \\ & = \text{(II)} 49a^2 + 21ab - 18b^2. \end{aligned}$$

- 24. (C):** (A) $3m \times 2m = \text{(II)} 6m^2$
 (B) $-9m \times -3n = \text{(III)} 27mn$
 (C) $4a^2 \times 4a^2 = \text{(IV)} 16a^4$
 (D) $2a \times 8a = \text{(I)} 16a^2$

- 25. (A):** A number is divisible by 3 only when the sum of its digit is divisible by 3.

Given, $2xy8$ is exactly divisible by 3

$$\begin{aligned} \therefore \frac{2+x+y+8}{3} &= \frac{10+x+y}{3} \\ &= \frac{10+2}{3} = 4, \text{ when } x+y=2. \end{aligned}$$

- 26. (B)**

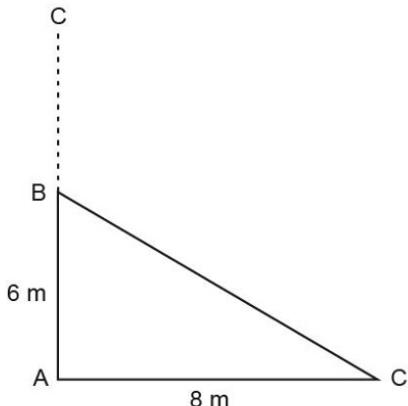
$$\begin{aligned} \text{27. (C): } 6x^2 + 5x - 6 &= 6x^2 + 9x - 4x - 6 \\ &= 3x(2x+3) - 2(2x+3) \\ &= (2x+3)(3x-2) \end{aligned}$$

$\therefore (2x+3)$ is one of the factor.

- 28. (C):** Let AC be the height of the tree
 then, $AC = AB + BC$
 given, $AB = 6 \text{ m}$
 $AC = 8 \text{ m}$

by pythagoras theorem

In $\triangle ABC$



$$\begin{aligned} AB^2 + AC^2 &= BC^2 \\ \Rightarrow 6^2 + 8^2 &= BC^2 \Rightarrow BC^2 = 36 + 64 \\ \Rightarrow BC^2 &= 100 = (10)^2 \\ \Rightarrow BC &= 10 \text{ m} \end{aligned}$$

\therefore the height of the tree = AC = AB + BC
 $= 6 + 10 = 16 \text{ m.}$

$$\begin{aligned} \text{29. (A): } \frac{M_1 d_1 h_1}{w_1} &= \frac{M_2 d_2 h_2}{w_2} \\ \Rightarrow \frac{15 \times 5 \times 1}{900} &= \frac{20 \times 7 \times 1}{w_2} \\ \Rightarrow 15 \times 5 \times w_2 &= 20 \times 7 \times 900 \\ \Rightarrow w_2 &= \frac{20 \times 7 \times 900}{15 \times 5} \\ &= 4 \times 7 \times 60 \\ \Rightarrow w_2 &= 1680 \\ \therefore 20 \text{ boys earn } \text{₹ } 1680 \text{ in 7 days.} \end{aligned}$$

- 30. (D):** Given, $AB \parallel CD$ and $EF \parallel GH$
 $\therefore PQRS$ is a parallelogram
 $\therefore \angle QPS = \angle QRS = 110^\circ$
 $\Rightarrow \angle QRS = 110^\circ$
 and $\angle QRS + \angle QRH = 180^\circ$
 (Linear pair of Angles)
 $\Rightarrow 110^\circ + \angle QRH = 180^\circ$
 $\Rightarrow \angle QRH = 180 - 110^\circ$
 $\Rightarrow \angle QRH = 70^\circ.$

$$\begin{aligned} \text{31. (C): } \because A &= P \left(1 + \frac{r}{100}\right)^n \\ \therefore 176400 &= 160000 \left(1 + \frac{5}{100}\right)^n \\ \Rightarrow \frac{176400}{160000} &= \left(1 + \frac{1}{20}\right)^n \\ \Rightarrow \frac{441}{400} &= \left(\frac{21}{20}\right)^n \\ \Rightarrow \left(\frac{21}{20}\right)^2 &= \left(\frac{21}{20}\right)^n \\ \Rightarrow n &= 2 \\ \therefore \text{Required time} &= 2 \text{ years.} \end{aligned}$$

$$\begin{aligned} \text{32. (D): Simple Interest} &= \frac{prt}{100} \\ &= \frac{1000 \times 10 \times 3}{100} = \text{₹ } 300 \end{aligned}$$

and compound interest

$$\begin{aligned}
 &= P \left(1 + \frac{r}{100} \right)^n - P \\
 &= 1000 \left(1 + \frac{10}{100} \right)^3 - 1000 \\
 &= 1000 \left(\frac{11}{10} \right)^3 - 1000 \\
 &= 1000 \times \frac{1331}{1000} - 1000 \\
 &= 1331 - 1000 = ₹ 331 \\
 \therefore \text{Anita gain at the end of 3 years} \\
 &= 331 - 330 = ₹ 1.
 \end{aligned}$$

33. (D): (Mohan + Rohan)'s 1 day's work

$$\begin{aligned}
 &= \frac{1}{25} + \frac{1}{20} \\
 &= \frac{4+5}{100} = \frac{9}{100}
 \end{aligned}$$

\Rightarrow (Mohan + Rohan)'s 5 day's work

$$= 5 \left(\frac{9}{100} \right) = \frac{9}{20}$$

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

Hence, Rohan will finish the remaining work in

$$\begin{aligned}
 &= \frac{\frac{11}{20}}{\frac{1}{20}} = 11 \text{ days.}
 \end{aligned}$$

34. (C)

35. (B)

36. (C): Let two numbers are x and $2x$.

$$\text{Then, } x^2 + (2x)^2 = 50,000$$

$$\Rightarrow x^2 + 4x^2 = 50,000$$

$$\Rightarrow 5x^2 = 50,000$$

$$\Rightarrow x^2 = 10,000$$

$$\Rightarrow x^2 = (100)^2$$

$$\Rightarrow x = 100$$

$$\begin{aligned}
 \therefore \text{The difference of numbers} &= 2x - x \\
 &= x = 100.
 \end{aligned}$$

37. (A): $\sqrt[3]{1372} \times \sqrt[3]{1458}$

$$\begin{aligned}
 &= (4 \times 7 \times 7 \times 7)^{1/3} \times (2 \times 9 \times 9 \times 9)^{1/3} \\
 &= (4 \times 7^3 \times 2 \times 9^3)^{1/3} \\
 &= (8 \times 7^3 \times 9^3)^{1/3} \\
 &= (2^3 \times 7^3 \times 9^3)^{1/3} \\
 &= 2 \times 7 \times 9 = 126.
 \end{aligned}$$

38. (C): $\because (a^3 + b^3 + c^3 - 3abc)$

$$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ac)$$

$$\text{When, } a + b + c = 0$$

$$\text{then, } a^3 + b^3 + c^3 = 3abc$$

$$\text{Given, } a = 12, b = -5 \text{ and } c = -7$$

$$\begin{aligned}
 \therefore a + b + c &= 12 - 5 - 7 \\
 &= 12 - 12 = 0
 \end{aligned}$$

$$\Rightarrow a + b + c = 0$$

$$\begin{aligned}
 \therefore a^3 + b^3 + c^3 &= 3abc \\
 &= 3 \times 12 \times -5 \times -7 \\
 &= 1260.
 \end{aligned}$$

39. (C): Here, $P = ₹ 7000$,

$$\text{depreciation} = 40\%, n = 2$$

$$\text{Value after } n \text{ years} = P \left(1 - \frac{r}{100} \right)^n$$

$$\Rightarrow \text{Value after 2 years} = 70000 \left(1 - \frac{40}{100} \right)^2$$

$$= 70000 \left(1 - \frac{2}{5} \right)^2$$

$$= 70000 \left(\frac{3}{5} \right)^2$$

$$= 70000 \times \frac{9}{25}$$

$$= 2800 \times 9$$

$$= ₹ 25200.$$

40. (D): Euler's formula for a polyhedron.

$$F + V - E = 2$$

$$(A) 4 + 4 - 6 = 8 - 6 = 2$$

$$(B) 8 + 6 - 12 = 14 - 12 = 2$$

$$(C) 12 + 20 - 30 = 32 - 30 = 2$$

$$(D) 6 + 4 - 6 = 4$$

\therefore Option (D) $V = 4$, $F = 6$, $E = 6$ can not be true for a polyhedron.

41. (A):

| Class | Mid-value (x) | Frequency (f) | fx |
|----------|------------------|---------------------|--------------------------|
| 0 – 20 | 10 | 17 | 170 |
| 20 – 40 | 30 | 28 | 840 |
| 40 – 60 | 50 | 32 | 1600 |
| 60 – 80 | 70 | f | $70f$ |
| 80 – 100 | 90 | 19 | 1710 |
| | | $\Sigma f = 96 + f$ | $\Sigma fx = 4320 + 70f$ |

$$\therefore \text{Mean} = \frac{\Sigma fx}{n}, \quad \Sigma f = n$$

$$\therefore 50 = \frac{4320 + 70f}{96 + f}$$

$$\Rightarrow 50(96 + f) = 4320 + 70f$$

$$\Rightarrow 4800 + 50f = 4320 + 70f$$

$$\Rightarrow 4800 - 4320 = 70f - 50f$$

$$\Rightarrow 20f = 480$$

$$\Rightarrow f = 24.$$

42. (A)

43. (D)

44. (C): Let $S = \{1, 2, 3, \dots, 30\}$
then $n(S) = 30$

Let E be the even of prime number

then $E = \{2, 3, 5, 7, 11, 13, 17, 19, 23, 29\}$

$$\therefore n(E) = 10$$

$$\therefore \text{Prob. of prime number} = \frac{n(E)}{n(S)} = \frac{10}{30} = \frac{1}{3}.$$

45. (A)

46. (B): Part filled by both taps in 1 hour

$$= \frac{1}{4} + \frac{1}{3} = \frac{7}{12}$$

\therefore It will take $\frac{12}{7}$ hour to fill it.

47. (B): Given, $p(x) = 3x^2 + 4x + 5$

$$g(x) = x - 2$$

$$\therefore p(x) = 3x^2 + 4x + 5 \\ = (x - 2)(3x + 10) + 25$$

\therefore When $p(x)$ is divided by $g(x)$
then, remainder = 25.

48. (B): Given, In a figure

$$\angle QAP = 35^\circ \text{ and } \angle ACD = 100^\circ$$

From given figure

$$\angle QAP = \angle BAC = 35^\circ,$$

[vertically opposite angle]

By exterior angle theorem:

$$\angle BAC + \angle ABC = \angle ACD$$

$$\Rightarrow 35^\circ + \angle ABC = 100^\circ$$

$$\Rightarrow \angle ABC = 100 - 35^\circ$$

$$\Rightarrow \angle ABC = 65^\circ.$$

49. (B): From given in the chart:

$$\text{Number of people} = 72$$

$$360^\circ = 72$$

$$\Rightarrow 1 = \frac{360}{72}$$

$$\Rightarrow 1 = 5^\circ$$

\therefore The number of people speaking Tamil = 7

$$\therefore \text{degrees represent} = 7 \times 5^\circ = 35^\circ.$$

50. (C): From the given line graph

The average sales of the company of the even years

$$= \frac{4 + 6 + 8}{3}$$

$$= \frac{18}{3} = 6 \text{ crores.}$$

51. (C)

52. (A)

53. (A)

54. (D)

55. (B)

56. (B)

57. (C)

58. (A)

59. (B)

60. (C)

61. (B)

62. (B)

63. (D)

64. (B)

65. (C)

66. (B)

67. (C)

68. (D)

69. (A)

70. (B)

71. (B)

72. (C)

73. (B)

74. (C)

75. (D)

76. (C)

77. (C)

78. (C)

79. (C)

80. (A)

81. (B)

82. (C)

83. (A)

84. (C)

85. (B)

86. (C)

- | | | |
|-------------------|----------------|----------------|
| 87. (A) | 88. (A) | 89. (B) |
| 90. (A, B) | 91. (A) | 92. (A) |
| 93. (B) | 94. (A) | 95. (B) |
| 96. (B) | 97. (C) | 98. (B) |

99. (A, B, C, D)

100. (C)

101. (C): The neighbourhood markets are the ones which provide all necessary items. There are many shops that sell goods and services in our neighbourhoods. We may buy milk from the dairy, groceries from departmental stores, stationery, eatables or medicines from other shops. Many of these are permanent shops, while others are roadside stalls such as that of the vegetable hawker, the fruit vendor, the mechanic, etc. Shops in the neighbourhood are useful in many ways. They are near our home and we can go there on any day of the week. Usually, the buyer and seller know each other and these shops also provide goods on credit.

102. (A)

103. (B): The Khilafat Movement, (1919-1920) was a movement of Indian Muslims, led by Muhammad Ali and Shaukat Ali, that demanded the following: The Turkish Sultan or Khalifa must retain control over the Muslim sacred places in the erstwhile Ottoman empire; the jazirat-ul-Arab (Arabia, Syria, Iraq, Palestine) must remain under Muslim sovereignty; and the Khalifa must be left with sufficient territory to enable him to defend the Islamic faith. The Congress supported the movement and Mahatma Gandhi sought to conjoin it to the Non-cooperation Movement.

104. (B): The Veda Samaj: Established in Madras (Chennai) in 1864, the Veda Samaj was inspired by the Brahmo Samaj. It worked to abolish caste distinctions and promote widow remarriage and women's education. Its members believed in one God. They

condemned the superstitions and rituals of orthodox Hinduism.

105. (B): Ladakh is a cold desert lying in the Great Himalayas, on the eastern side of Jammu and Kashmir. The Karakoram Range in the north and the Zanskar mountains in the south enclose it. Several rivers flow through Ladakh, Indus being the most important among them. The rivers form deep valleys and gorges. Several glaciers are found in Ladakh, for example the Gangri glacier. The day temperatures in summer are just above zero degree and the night temperatures well below -30°C. It is freezing cold in the winters when the temperatures may remain below -40°C for most of the time.

The people here are either Muslims or Buddhists. In fact several Buddhists monasteries dot the Ladakhi landscape with their traditional 'gompas'. Some famous monasteries are Hemis, Thiksey, Shey and Lamayuru.

106. (C)

107. (C): Mediterranean forest:

- For their fruit production, Mediterranean forests are renowned as the "Orchards of the World."
- Citrus fruits like oranges, figs, olives, and grapes are widely grown here.
- Mediterranean woodlands are found in the Mediterranean Sea region, Central Chile, the Southwest United States, Australia, and Africa.
- They feature thick barks and waxy leaves that aid in reducing transpiration.
- Mediterranean plants adapt to dry summers.

108. (C): Sedimentary rocks are formed by deposition, sedimentation, and lithification of sediments over a long period of time.

Sedimentary rocks may also contain fossils of plants, animals that once lived on them. The word ‘sedimentary’ is derived from the Latin word “sedimentum”. Shale, limestone, and conglomerate are some other examples of sedimentary rocks.

109. (B)

110. (A): Rice is not grown in plantations. Rice is the staple food crop of a majority of the people in India. Our country is the second largest producer of rice in the world after China. It is a kharif crop which requires high temperature, (above 25°C) and high humidity with annual rainfall above 100 cm. In the areas of less rainfall, it grows with the help of irrigation. It grows best in alluvial clayey soil, which can retain water. China leads in the production of rice followed by India, Japan, Sri Lanka and Egypt. In favourable climatic conditions as in West Bengal and Bangladesh two to three crops are grown in a year.

111. (B): Raja Rammohan Roy (1772 AD-1883 AD): Born in 1772 AD, founded Atmiya Sabha in Calcutta in 1815 AD, that was named Brahmo Sabha and finally Brahmo Samaj in 1828 AD. His journal was named Sabad Kaumudi. Debender became the leader of the Brahmo Samaj after Raja Rammohan Roy. He founded Tattvabodhini Sabha in 1839 and published Tattvabodhini Patrika. He compiled selected passages from the Upanishads, which came to be known as Brahma Dharma.

112. (D): A patent is an exclusive right granted for an invention. In other words, a patent is an exclusive right to a product or a process that generally provides a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application. The patent owner may give permission to, or license, other parties to use the invention on

mutually agreed terms. The owner may also sell the right to the invention to someone else, who will then become the new owner of the patent.

113. (B): Sher Shah Suri (1540-1545) started his career as the manager of a small territory for his uncle in Bihar and eventually challenged and defeated the Mughal emperor Humayun (1530-1540, 1555-1556). Sher Shah captured Delhi and established his own dynasty. Although the Suri dynasty ruled for only fifteen years (1540-1555), it introduced an administration that borrowed elements from Alauddin Khalji and made them more efficient. Sher Shah's administration became the model followed by the great emperor Akbar (1556-1605) when he consolidated the Mughal Empire.

114. (D): The sources of funds for the Gram Panchayat are as follows:

- Collection of taxes on houses, market places etc.
- Government scheme funds received through various departments of the government - through the Janpad and Zila Panchayats.
- Donations for community works etc

115. (D): Erosional landforms by rivers are gorges, canyons, V-shaped valleys, waterfalls, levees, potholes, meanders and oxbow lakes. Loess is a clastic, predominantly silt-sized sediment that is formed by the accumulation of wind-blown dust. Ten percent of Earth's land area is covered by loess or similar deposits. Loess is a periglacial or aeolian (windborne) sediment, defined as an accumulation of 20% or less of clay and a balance of roughly equal parts sand and silt, often loosely cemented by calcium carbonate. Usually it is homogeneous and highly porous; it is traversed by vertical capillaries which permit the sediment to fracture and form vertical bluffs.

116. (B) 117. (C)

118. (D): Right to Health is a part and parcel of Right to Life and therefore right to health is a fundamental right guaranteed to every citizen of India under Article 21 of the Constitution of India.

119. (C): The word metamorphic means ‘change of form’. These rocks form under the action of pressure, volume and temperature (PVT) changes. Metamorphism occurs when rocks are forced down to lower levels by tectonic processes or when molten magma rising through the crust comes in contact with the crustal rocks or the underlying rocks are subjected to great amounts of pressure by overlying rocks. Metamorphism is a process by which already consolidated rocks undergo recrystallisation and reorganisation of materials within original rocks.

120. (A)

121. (C): The birth rate for a given period is the total number of live human births per 1,000 population divided by the length of the period in years. The number of live births is normally taken from a universal registration system for births; population counts from a census, and estimation through specialized demographic techniques. The birth rate (along with mortality and migration rates) is used to calculate population growth. The estimated average population may be taken as the mid-year population.

122. (B)

123. (C): Steel Authority of India Limited (SAIL) is a central public sector undertaking based in New Delhi, India. It is under the ownership of Ministry of Steel, Government of India. Incorporated on 24 January 1973, SAIL has 60,766 employees (as of 1 October 2022). SAIL operates and owns five integrated steel plants at Bhilai, Rourkela, Durgapur, Bokaro and Burnpur (Asansol) and three special steel plants at Salem, Durgapur and Bhadravathi. It also owns a Ferro Alloy plant at Chandrapur.

124. (B)

125. (B)

126. (A): $\frac{2}{5} : \frac{8}{25} \Rightarrow \frac{2^3}{5^2} = \frac{8}{25}$

and $\frac{11}{15} : \dots \Rightarrow \frac{11^3}{15^2} = \frac{1331}{225}$

$$\therefore \frac{2}{5} : \frac{8}{25} :: \frac{11}{15} : \boxed{\frac{1331}{225}}$$

127. (C): Given,

$$\begin{array}{cccc} M & A & T & H \\ \times 2 \downarrow & \times 2 \downarrow & \times 2 \downarrow & \times 2 \downarrow \\ 26 & 2 & 40 & 16 \end{array}$$

Similarly,

$$\begin{array}{cccc} B & O & O & K \\ \times 2 \downarrow & \times 2 \downarrow & \times 2 \downarrow & \times 2 \downarrow \\ 4 & 30 & 30 & 22 \end{array}$$

\therefore The code for the word Book is 4303022.

128. (C): $B > A > C, D > C \Rightarrow B > A > D > C$
Here, C is shortest among all.

129. (*)

130. (A):

A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z

Here, X would be corresponding to letter K.

131. (D): A meaningful sequence

Root \rightarrow Stem \rightarrow Leaf \rightarrow Flower \rightarrow Fruit.

132. (C): From given figure:

1st: $3 \times 4 + 2 = 12 + 2 = 14$

2nd: $5 \times 6 + 2 = 30 + 2 = 32$

Similalry,

3rd: $8 \times 9 + 2 = 72 + 2 = \boxed{74}$

$\therefore ? = 74.$

133. (D) 134. (D) 135. (D)

136. (C): $36 : 225 \Rightarrow (6)^2 : (15)^2$

$1225 : \underline{\quad} \Rightarrow (35)^2 :$

from given options

only option (C) $5929 = (77)^2$

$1225 : 5929$

$\therefore (35)^2 : (77)^2$

Hence, $36 : 225 :: 1225 : \boxed{5929}.$

137. (B): 16 : 41

$$\Rightarrow 16 \times 3 - 7 = 48 - 7 = 41,$$

$$20 : \underline{\quad}$$

$$\Rightarrow 20 \times 3 - 7 = 60 - 7 = 53$$

$$\therefore 16 : 41 :: 20 : 53.$$

138. (A)

139. (C): According to English dictionary

Aaerstd → Aaersted → Acgledhi → Acgledih
→ Amquarine.

140. (C)

141. (D)

142. (A)

143. (C): $\begin{array}{ccccccccc} z & x & v, & l & j & h, & i & g & e, \\ \downarrow & \downarrow \\ -2 & -2 & -2 & -2 & -2 & -2 & -1 & -2 & -2 \end{array}$, $u \uparrow t \uparrow r, p \uparrow n \uparrow l$

Here, (C) UTR is odd.

144. (*)

145. (C): From given figure:

$$1\text{st: } (8 + 6) - (3 + 4 + 1) = 14 - 8 = 6$$

$$2\text{nd: } (5 + 7) - (5 + 1 + 1) = 12 - 7 = 5$$

Similarly,

$$3\text{rd: } (6 + 4) - (0 + 5 + 1) = 10 - 6 = \boxed{4}$$

$\therefore ? =$ the missing number = 4.

146. (D): From given pattern:

Row

$$1\text{st: } 5 \times 7 + 5 = 35 + 5 = 40$$

$$2\text{nd: } 11 \times 6 + 11 = 66 + 11 = 77$$

$$3\text{rd: } 3 \times 9 + 3 = 27 + 3 = \boxed{30}$$

$\therefore ? =$ the missing number = 30.

147. (B): $\begin{array}{ccccccccc} A & B & C & D & E & F & G \\ | & | & | & | & | & | & | \\ N & M & L & K & J & I & H \end{array}$

$$C \rightarrow L$$

$$F \rightarrow I$$

Similarly, $A \rightarrow N$

$$\therefore ? = N$$

148. (D)

149. (B)

150. (A)
