



UNIFIED COUNCIL
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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: UN 421

Solutions for Class : 5

Mathematics

1. (A)

$$\begin{array}{r} 5 \overline{)2025} \\ 5 \overline{)405} \\ 9 \overline{)81} \\ \hline \end{array}$$

$$2025 = 5 \times 5 \times 9 \times 9$$

$$= A \times A \times B \times B$$

Therefore, A = 5 and B = 9.

2. (C)

$$\frac{3}{4}, 1\frac{4}{5}, 2\frac{5}{6}, \boxed{?}, 4\frac{7}{8}$$

$$\begin{array}{ccccccc} & +6 & +8 & +10 & +12 & & \\ \curvearrowright & & & & & & \\ \frac{3}{4} & \frac{9}{5} & \frac{17}{6} & \boxed{} & \frac{39}{8} & & \\ \curvearrowleft & & & & & & \\ & +1 & +1 & +1 & +1 & & \end{array}$$

∴ The missing fraction is $\frac{17 + 10}{6 + 1}$

$$= \frac{27}{7} = 3\frac{6}{7}$$

3. (A)

$$28.5 \times 7 - 27 \times 3 - 29 \times 3 = 31.5 \text{ }^\circ\text{C}$$

4. (A)

Area is the amount of surface occupied by an object.

5. (C)

$$ML = 1000 + 50 = 1050$$

$$LX = 50 + 10 = 60$$

$$CLV = 100 + 50 + 5 = 155$$

$$XL = 50 - 10 = 40$$

∴ P has the largest number.

6. (D)

Total number of rabbits and monkeys = 12

Number of rabbits = 3 times of monkeys.

$$\Rightarrow \text{Rabbits} + \text{Monkeys} = 12$$

$$\Rightarrow 3(\text{Monkeys}) + \text{Monkeys} = 12$$

$$\Rightarrow 3(3) + (3) = 12.$$

∴ There were **3 monkeys** in the zoo.

7. (A)

A **chord** joins two points on a circle.

8. (A)

Consider the least multiple of 35 divisible by 35, which is $35 \times 1 = 35$.

$$\text{The number} = 35 - 8 = 27$$

When 27 is divided by 5, the remainder is **2**.

9. (A)

A chess board has $8 \times 8 = 64$

squares of which 32 are black.

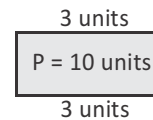
Hence, the percentage of black squares

$$= \frac{32}{64} \times 100\% = 50\%.$$

10. (D)

Perimeter = 10 units

Ratio of perimeter and length = 10 : 3



$$\therefore \text{Breadth} = \frac{10 - 2 \times 3}{2}$$

2 units → 8 cm (Given)

1 unit → 4 cm

3 units → 4 cm × 3 = 12 cm

Area → 12 cm × 8 cm = **96 cm²**

11. (A)

The place value of 5 in 91,25,678 is 5000. Its face value is 5. Thus, the required difference = $5000 - 5 = 4995$

12. (C)

$$5 \times 4 \times 2 = 40$$

$$5 \times 4 + 2 = 22$$

$$5 - 4 + 2 = 3$$

$$5 \times 4 \div 2 = 10$$

∴ -, + symbols can be used to get the smallest possible result.

13. (A) $\frac{0.1}{0.01} + \frac{0.01}{0.1}$
 $= \left(\frac{1}{10} \div \frac{1}{100}\right) + \left(\frac{1}{100} \div \frac{1}{10}\right)$
 $= \left(\frac{1}{10} \times 100\right) + \left(\frac{1}{100} \times 10\right)$
 $= 10 + \frac{1}{10} = 10 + 0.1 = 10.1$

14. (D) $0.75 = \frac{3}{4}$

∴ Option (D) shows the shaded region as $\frac{3}{4}$ of the whole.

15. (B) A right angle is formed between the hands of a clock at **3 O'clock**.



16. (B) $0.19 > 0.11 > 0.109 > 0.10$
 So, **0.19** has the greatest value.

17. (D) $4 \text{ cm} + 7 \text{ cm} = 11 \text{ cm} > 5 \text{ cm}$
 Hence the third side can be **5 cm** long.

18. (C) The numbers with 0, 2, 4, 6 or 8 in the ones place are divisible by 2.
 So, **72028** is the required number.

19. (B) No. of girls = $42 - 12 = 30$
 ∴ The ratio of number of girls to no. of boys = $30 : 12 = 5 : 2$.

20. (C) When a square is cut into two pieces by a straight cut, it cannot result in **2 squares**.

21. (C) As AB is a straight line $\angle p + \angle q = 180^\circ$.

22. (D) $1 \text{ h } 20 \text{ min} = (60 + 20) \text{ min}$
 $= \mathbf{80 \text{ min}}$
 ∴ The required ratio = $25 : 80 = 5 : 16$

23. (A) $48 + 8 = 56 \div 14 = 4$.
 ∴ The required number is **48**.

24. (A) Number of children = 18
 Number of cookies required if each child eats 2 cookies = $2 \times 18 = \mathbf{36}$

No. of cookies in each package = 12
 Number of packages required = $36 \div 12$
 $= \mathbf{3}$.

25. (B) $= 12 \Rightarrow \triangle = 3$

$= 20$
 $\downarrow \quad \downarrow$
 $3 \quad 3$

\Rightarrow $= 20 - 3 - 3 = 14$.

26. (C) Number of turns = $1 \text{ km} \div 5 \text{ m}$
 $= 1000 \text{ m} \div 5 \text{ m}$
 $= \mathbf{200}$

27. (C) $9.85 \approx 10$ and $23.099 \approx 23$
 ∴ $9.85 \times 23.099 \approx \mathbf{10 \times 23}$

28. (C) No. of juice drink boxes in each carton = 6
 No. of students = 29
 No. of juice boxes in 5 cartons = $5 \times 6 = 30$

∴ No. of cartons required so that each student gets one juice drink box = **5**.

29. (A) Amount paid for 2 adults and 2 children tickets = ₹20.
 By trail and error method, consider giant wheel.
 $\Rightarrow 2 \times (\text{₹}7.50) + 2 (\text{₹}2.50)$
 $\Rightarrow \text{₹}(15 + 5) = \text{₹}20$

∴ Simar's father bought **giant wheel** tickets.

30. (D) The angle 'm' given lies between 180° and 270° . An estimate of the answer = **250°** .

31. (B) Given area of the rectangle = 36.
 If the width is 6, then length = $\frac{36}{6} = 6$
 \Rightarrow Both length and width are same. Thus it becomes a square.
 ∴ Its width cannot be **6**.

32. (C)

$$\triangle \times 10 = \star \times 15$$

$$\Rightarrow \frac{\star}{\triangle} = \frac{10}{15} = \frac{2}{3} = \frac{2 \times 6}{3 \times 6} = \frac{12}{18}$$

\therefore The value of $\star = 12$ and $\triangle = 18$.

33. (C)

$$1 \text{ h } 35 \text{ min} = (60 + 35) \text{ min} [\because 1 \text{ h} = 60 \text{ min}]$$

$$= 95 \text{ min}$$

$$1 \text{ h } 55 \text{ min} = (60 + 55) \text{ min}$$

$$= 115 \text{ min}$$

$$2 \text{ hours} = 2 \times 60 \text{ min} = 120 \text{ min.}$$

$$\text{Average time} = \frac{95 + 115 + 120}{3} = \frac{330}{3} = 110 \text{ min}$$

$$110 \text{ min} = (60 + 50) \text{ min}$$

$$= \mathbf{1 \text{ h } 50 \text{ min.}}$$

34. (C)

$$\text{Distance} = 800 \text{ m}$$

$$\text{Time} = 15 \text{ min} = 15 \times 60 \text{ seconds}$$

$$\text{Speed} = \frac{800}{15 \times 60} = \frac{8}{9} \text{ m/s}$$

35. (C)

$$\text{Area of rectangle A} : \text{Area of rectangle B}$$

$$= (8 \times 5) \text{ cm}^2 : (15 \times 4) \text{ cm}^2$$

$$= 40 : 60$$

$$= \mathbf{2 : 3}$$

36. (C)

$$\text{Best estimate for } 6143 \times 590 \text{ is } 6000 \times 600$$

$$= \mathbf{3600000.}$$

37. (C)

$$12 + 20 \div 4 \text{ (?) } 8 - 2 = 50$$

$$\Rightarrow 12 + 5 \text{ (?) } 8 - 2 = 50$$

$$\Rightarrow 5 \text{ (?) } 8 = 40$$

$$\Rightarrow 5 \times 8 = 40$$

\therefore The missing sign is \times .

38. (C)

$$\text{Required percentage} = \frac{344}{800} \times 100\%$$

$$= \mathbf{43\%}.$$

39. (C)

$15 = 3 \times 5$ [3, 5 are whole numbers which differ by 2].

$35 = 7 \times 5$ [5, 7 are whole numbers which differ by 2].

$195 = 13 \times 15$ [13, 15 are whole numbers which differ by 2].

$$105 = 15 \times 7$$

$$21 \times 5$$

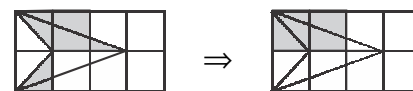
$$35 \times 3$$

Here, **except 105** all other options are the products of two whole numbers which differ by 2.

40. (B)

$$\text{Area of shaded region} = 18 \text{ cm}^2.$$

The given figure can be redrawn as shown.



\therefore The total area of shaded region is equal to the area of two squares

$$\Rightarrow \text{Area of two squares} = 18 \text{ cm}^2$$

$$\Rightarrow \text{Area of a square} = (18 \div 2) \text{ cm}^2 = 9 \text{ cm}^2$$

$$\therefore \text{The side of a square} = \sqrt{9 \text{ cm}^2}$$

$$= \mathbf{3 \text{ cm.}}$$

41. (C)

$$3y + 2y = 180^\circ$$

$$\Rightarrow y = 180^\circ \div 5 = 36^\circ$$

$$x = 2y = 2 \times 36^\circ = \mathbf{72^\circ}$$

42. (D)

$$\text{Number of 1 cm cubes needed}$$

$$= 24 \times 20 \times 14$$

$$= \mathbf{6720}$$

43. (B)

Sum of angles at a point = $360^\circ = 4$ right angles.

A protractor is used to measure angles.

The sum of angles on a straight line is 180° .

Vertically opposite angles are equal.

44. (D)

$$30\% \text{ of a number} = 24$$

$$1 \frac{1}{2} \text{ times a number}$$

$$= 150\% \text{ of the number}$$

$$= \frac{24}{30} \times 150 = \mathbf{120}$$

45. (A)

Ruhi's dance recital will ending 30 minutes after 4: 30 p.m. [i.e, 5: 00 p.m.]

\Rightarrow The required clock face must show **5 o'clock**.

General Science

46. (C) Cotyledons or seed leaves supply food, radicle forms the root and plumule forms leaves and stem.
47. (B) All these animals are adapted to fly.
48. (B) Pumice is an igneous rock.
49. (A) The process of changing solid form to liquid is called melting.
50. (B) The correct combination is: p-ii, q-iii, r-i. Pulley is used for lifting heavy objects, wedge, for cutting objects and screw for fixing two objects.
51. (B) The seeds of guava do not get digested by the animals and are passed out through faeces.
52. (A) The backbone or the vertebral column protects the spinal cord.
53. (D) For the proper functioning of our body and for remaining healthy, rest, balanced diet and exercise are needed.
54. (D) Pumice is porous or full of holes.
55. (A) Oxygen gas is used up in the burning of things and in the process of respiration and release carbon dioxide.
56. (A) Hinge joint allows movement in only one direction. The movement is similar to the movement of a door on its hinges.
Example : The knee and elbow joints.
57. (C) A tortoise has a hard and strong shell. Which protects it from its predators.
58. (A) Air is necessary for burning.
59. (A) The lever, inclined plane, pulley, screw, wheel and axle are simple machines.
60. (B) The seedling was dispersed by water.
61. (B) The function of the skeletal system is to give support and shape to the body.
62. (C) Deficiency of vitamin 'C' causes scurvy.
63. (A) Lunar eclipse occurs on a full moon day.
64. (D) Spiders make cobwebs for shelter, for protection and to catch its prey.
65. (B) A sea-saw is a first class lever.
66. (A) Radicle grows first it is the first root of the plant.
67. (A) Skull protects the brain. It is also called cranium or bony box.
68. (C) The given figure is that of a satellite.
69. (A) In the first class lever, fulcrum is between load and effort.
70. (C) In the given figure R is called the condensed stem. It grows into a new plant.
71. (D) Nerve cell, vertebral column and brain are the parts of central nervous system.
72. (A) The volume of water displaced by the object = 10 ml.
73. (D) When water is heated, it changes to water vapour. The process is called evaporation.
74. (C) The hump of camel stores fat.
75. (D) For a fire to start it needs a substance that can burn, air and kindling temperature.
76. (A) Land dwelling are called terrestrial.
77. (D) There are 206 bones in our body.
78. (A) The moon is a natural satellite of the earth.
79. (B) The square represents load, the triangle represents fulcrum and the arrow represents effort.
80. (A) The correct food chain based on the given figure is :
seeds → chicken → eagle.
81. (C) Pellagra is a vitamin deficiency disease.
82. (B) Obsidian is smooth and glassy. It is black and dark coloured and is used in jewellery and ornaments.
83. (C) The moon undergoes periodic changes and reflects sunlight.
84. (D) The animal that Anish saw is a fish.
85. (B) The correct combination is: Potato - eyes, onion- bulbs, Bryophyllum-leaves, Rose-stem cutting.
86. (B) Vitamin 'C' prevents the disease bleeding gums or scurvy.
87. (A) Carbohydrates and proteins are missing in Arun's breakfast.
88. (C) The changing shapes of the moon are called phases.
89. (A) Pliers and scissors are examples of the first order levers.
90. (B) A fish uses fins to move in water.