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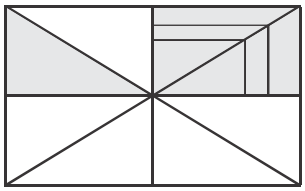
NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: UN436 (UPDATED)

Solutions for Class : 5

MATHEMATICS

1. **(B)**



3 out of 8 parts are shaded.

$\therefore$ Required fraction $= \frac{3}{8}$

2. **(C)** The place value of 0 in any place in a number is zero.

3. **(D)** 1 litre to be added.

i.e., 1000 cm^3

4. **(C)** 36, 54, 72 are three common multiples of 18 and 6.

5. **(C)** Let the third number be 100.

$$\text{Required \%} = \frac{120 \times 100}{150} = 80\%$$

6. **(C)** The prime numbers between 50 and 100 are 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97, which are 10 in number.

7. **(D)** Convert all fractions to those with the same denominators and compare their numerators.

$\therefore$ The fraction greater than $\frac{7}{8}$ is $\frac{11}{12}$.

8. **(C)** Let the no. of pencils be 'x'

Given red pencils = $\frac{3}{5}x$.

$\therefore$ Green pencils = $x - \frac{3x}{5} = \frac{2x}{5}$.

Given $\frac{2}{3}$ of red pencils & $\frac{1}{4}$ of green pencils given to her sister.

$\therefore$ Remaining pencils

$$= \frac{3}{5}x \times \left(1 - \frac{2}{3}\right) + \frac{2}{5} \times \left(1 - \frac{1}{4}\right)$$

$$= \frac{x}{5} + \frac{3\cancel{6}x}{\cancel{20}\,10}$$

$$= \frac{2x + 3x}{10}$$

$$= \frac{5x}{\cancel{10}\,2} = \frac{x}{2}$$

Given $\frac{x}{2} = 80$

$\therefore$ $x = 2 \times 80$

$x = 160$

9. **(C)** $\frac{3}{4}, 1\frac{4}{5}, 2\frac{5}{6}, \boxed{?}, 4\frac{7}{8}$

$$= \frac{3}{4}, \overset{+6}{\underset{+1}{\frac{9}{5}}}, \overset{+8}{\underset{+1}{\frac{17}{6}}}, \overset{+10}{\underset{+1}{\square}}, \overset{+12}{\underset{+1}{\frac{39}{8}}}$$

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

$= \frac{27}{7} = \mathbf{3\,\frac{6}{7}}$.

10. **(A)** $125.625 \div 0.5$

$$= \frac{125625}{1000} \div \frac{5}{10} = 251.25$$

11. **(A)** Area of X = $\frac{1}{2} \times bh = \frac{1}{2} \times 4 \times 2 = 4cm^2$

Area of Y = $S^2 = 3 \times 3 = 9\ cm^2$

Area of rectangle = l × b = (9 × 4) = 36 cm^2

$\therefore$ Area of shaded part = 36 – (4 + 9) = 36 – 13 = 23 cm^2.

12. **(A)** $28.5 \times 7 - 27 \times 3 - 29 \times 3 = 31.5\ ^{\circ}C$

13. **(A)** The join of two points on a circule is its chord.

14. **(A)** The given figure becomes a cuboid if it has $4 \times 3 \times 2 = 24$ cubes.

The no. of cubes in the given figure = 11

$\therefore$ The no. of cubes that must be added to make it a cuboid = 24 – 11 = 13

Hence, its volume = $13 \times 2 \times 2 \times 2\ cm^3$

$= 104\ cm^3$

15. **(C)** 10 times.

16. **(D)** $43.16\ l = 43160\ ml$

$= 43l\ 160\ ml$

Total volume of juice

$= 43l\ 160\ ml + 39l\ 30\ ml$

$= 82l\ 190\ ml$

17. **(B)** 5l ÷ 300 ml 300) 5000 (16

4800

200 ml

$\therefore$ $300\ ml - 200\ l = 100\ ml$

required for complete both.

18. **(B)** Average time taken by the boys

$$= \frac{63+60+66+59+68}{5}$$

$$= \frac{316}{5} = 63.2 \text{ seconds}$$

19. **(B)** $0.777 = 7 \times 0.111$

$$= 7 \times \frac{1}{9} = \frac{7}{9}$$

20. **(A)** $$\frac{7}{10} - \frac{2}{5} + \frac{1}{2} = \frac{7}{10} - \frac{4}{10} + \frac{5}{10}$$

$$= \frac{7-4+5}{10} = \frac{8}{10} = \frac{4}{5}$$

The missing number is 5.

21. **(A)** Co-prime numbers have no common factor other than 1. So, their H.C.F is 1.

22. **(A)** Given $\frac{x+y}{2} = 108$

$x + y = 2 \times 108 = 216$

$x + y = 216$

Given $y = 3x$

$\therefore\ x + 3x = 216$

$4x = 216$

$x = 54$

$y - x = 3x - x = 2x = 2 \times 54 = 108$

23. **(A)** $$\frac{0.1}{0.01} + \frac{0.01}{0.1}$$

$$= \left(\frac{1}{10} \div \frac{1}{100}\right) + \left(\frac{1}{100} \div \frac{1}{10}\right)$$

$$= \left(\frac{1}{10} \times 100\right) + \left(\frac{1}{100} \times 10\right)$$

$$= 10 + \frac{1}{10} = 10 + 0.1 = 10.1$$

24. **(A)** $\mathbf{\frac{1}{6} + \frac{1}{6}} = \frac{2}{6} = \frac{1}{3}$

25. **(C)** L.C.M. of 12, 15, 20 and 35 = 420

420) 1000 (2

840

160

$\therefore$ Required number

= 1000 + (420 – 160) = **1260**

26. **(C)** In the figures P and R the given condition for the number of angles is satisfied.

27. **(C)** $\frac{4}{5}$ kg fish + 2 kg squid $\rightarrow$ ₹ 52

$\frac{1}{4}$ kg fish + 1 kg squid $\rightarrow$ ₹ 23

$\frac{2}{4}$ kg fish + 2 kg squid $\rightarrow$ ₹ 46

$\frac{4}{5}$ kg fish – $\frac{1}{2}$ kg fish $\rightarrow$ ₹ 52 – ₹46

$\frac{8}{10}$ kg fish – $\frac{5}{10}$ kg fish $\rightarrow$ ₹ 6

$\frac{3}{10}$ kg fish $\rightarrow$ ₹ 6

$\frac{1}{10}$ kg fish $\rightarrow$ ₹ 6 ÷ 3 = ₹ 2

1 kg fish $\rightarrow$ 10 × ₹ 2 = ₹20

$\frac{1}{4}$ kg fish $\rightarrow$ ₹ 20 ÷ 4 = ₹ 5

1 kg squid $\rightarrow$ ₹ 23 – ₹ 5 = ₹ 18

3 kg squid $\rightarrow$ 3 × ₹ 18 = ₹ 54

28. **(B)** The required product

$= 1\frac{1}{3} \times 3\frac{1}{4} \times \frac{7}{8}$

$= \frac{4}{3} \times \frac{13}{4} \times \frac{7}{8}$

$= \frac{13 \times 7}{3 \times 8} = \frac{91}{24} = \mathbf{3\ \frac{19}{24}}$

29. **(C)** No. of bags of chocolates = $1\frac{1}{2}$

No. of packets in each bag = 32

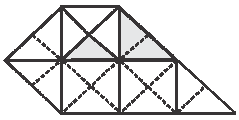
No. of chocolates in each packet = 10

$\therefore$ Total no. of chocolates Vinod had = $1\frac{1}{2} \times 32 \times 10$

30. **(B)** A simple closed figure bounded by three line segments is called a triangle.

31. **(C)** $\frac{2385}{3} = 7\boxed{9}5$

32. **(B)**



Shaded fraction = $\frac{3}{20} = 0.15$

33. **(B)** $\frac{\left(\frac{3}{6}+\frac{2}{6}\right)}{\left(\frac{5}{20}+\frac{8}{20}\right)} = \frac{\left(5/6\right)}{\left(13/20\right)} = \frac{50}{39}$

34. **(D)** The cost of 15 sandwiches = ₹ 225

$\therefore$ The cost of 21 sandwiches

$= \left(\frac{225 \times 21}{15}\right) = 15 \times 21 = ₹\ 315$

$\therefore$ Answer is option (D).

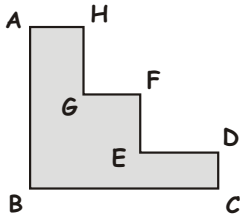
35. **(D)** H.C.F x L.C.M = a x b

$\Rightarrow$ 285 = 15 x b

$\Rightarrow$ $\frac{285}{15} = b \Rightarrow b = 19$

$\therefore$ Answer is option (D).

36. **(B)** Given figure consist of only horizontal and vertical lines.



AB = CD + EF + GH

BC = AH + GF + ED

Overall length and breadth are given as 10 cm and 12 cm.

$\therefore$ Perimeter = 2 (l + b) = (10 + 12) = 2 (22) = 44 cm.

$\therefore$ Answer is option (B).

37. **(C)** 5663 is nearer to 5660 and 2234 is nearer to 2230. Best estimiation of 5663 × 2234 is 5660 × 2230.

38. **(B)** Flow of water in 1 minutes = 3.5 *l*

$\Rightarrow$ Flow of water in 15 minutes = (15 × 3.5) = 52.5 *l*.

39. **(D)** 70 = 2 x 5 x 7

The prime factors of 70 are 2, 5, 7

$\therefore$ p + q + r = 2 + 5 + 7 = 14

40. **(D)** $0.3 \div 0.3 \times 3 = 1 \times 3 = 3$

41. **(B)** Of the given options 33 and 55 have 11 as their greatest common factor.

42. **(A)** P = ₹ 1800, A = ₹ 2700,

T = 10 years

I = A – P = ₹(2700 – 1800) = ₹ 900

$R = \frac{100 \times I}{P \times T} = \frac{100 \times 900}{1800 \times 10} = 5\%$

43. **(A)** Given, A = 31.36 and B = 45.63

$\therefore$ 2 A – B = 2 × 31.36 – 45.63

= 62.72 – 45.63 = 17.09

44. **(B)** $\frac{2 \times 2}{5 \times 2} = \frac{4}{10}$, $\frac{5 \times 5}{2 \times 5} = \frac{25}{10}$, $\frac{7 \times 2}{5 \times 2} = \frac{14}{10}$

$\frac{9 \times 5}{2 \times 5} = \frac{45}{10}$, $\frac{7 \times 5}{2 \times 5} = \frac{35}{10}$

$\Rightarrow \frac{4}{10} < \frac{14}{10} < \frac{25}{10} < \frac{35}{10} < \frac{45}{10}$

Hence $\frac{14}{10}\left(\text{i.e., } \frac{7}{5}\right)$ lies between

$\frac{4}{10}\left(\text{i.e., } \frac{2}{5}\right)$ & $\frac{25}{10}\left(\text{i.e., } \frac{5}{2}\right)$

45. **(D)** 0.3 + 0.03 + 0.003 = 0.333

GENERAL SCIENCE

46. **(D)** The digestive system breaks down food that we eat into simpler substances.

47. **(C)** The given joint is present at elbow and knee. Such joints are called hinge joint.

48. **(C)** The life cycle of a plant starts with a seed, followed by the roots which help absorb water from the soil. Soon, the shoot will appear and it will grow leaves.

49. **(B)** Oxygen helps in combustion. When a burning stick brought into a jar filled with oxygen burning stick burn more brightly.

50. **(B)** Skull bones protect brain and rib bones protect lungs and heart.

51. **(C)** The tree will not be uprooted from the ground easily as the roots help to hold the plant firmly in place on the ground.

52. **(C)** The tortoise, moth and lizard reproduce by laying eggs. Only the lizard crawls. The moth is an insect, so it has six legs, not four.

53. **(A)** Mixture of sand and iron filings are separated by magnetic separation.

54. **(B)** Tomato seeds are dispersed by animals.

55. **(D)** If fulcrum lies between effort and load such simple machines are I order levers. Scissors and hammer claw are I order levers.

56. **(A)** Lotus plant is a floating aquatic plant with broad leaves. Leaves are coated with a layer of wax with hollow stems and stomata are present on upper surface of leaf.

57. **(D)** A block of wood is a solid. Solids have definite shape and no intercellular spaces between molecules. Hence they cannot be compressed.

58. **(C)** The fish uses its fins (labelled P) and tail (labelled Q) to help it move about in the water. The scales (labelled R) protect the fish from injuries.

59. **(D)** Potato is a stem tuber (dormant buds) new plants grow from the eyes of the modified stems.

60. **(Del)**

61. **(C)** Living things reproduce so that there will always be living things like themselves around.

62. **(D)** Mushrooms and bread mould can be grouped as fungi.

63. **(D)** The sweet potato is a storage root plant. Besides helping to absorb water and mineral salts for the plant. It also stores food.

64. **(B)** The surround air and plate are losing heat to the melting ice cube. The temperature of the melting ice remains at $0^{o}C$ until the whole ice has melted completely.

65. **(B)** Hip joint is also called ball and socket joint.

66. **(D)** Vitamin D is called sunshine vitamin. It is prepared in our body in the presence of sunlight.

67. **(C)** The legs are found on the thorax, which is the middle part of the insect.

68. **(A)** The bear eats almost anything. It basically eats both plants and animals. However, the sheep, elephant and goat eat plants.

69. **(C)** Yeast is useful to us as we can use them in bread-baking and wine-making. Yeast converts the sugar present in dough into the gas, carbon dioxide. The dough then expands and rises as gas forms pockets in it. Yeast converts the sugar present in grape juice into alcohol.

70. **(B)** Part A is the seed coat. It acts as a protective layer to the seed until it is time for it to sprout.

71. **(D)** The skeletal system provides a structure frame for our body, but not the bulk frame. It is the muscular system that gives the bulk.

72. **(D)** Our muscles are working at all times when we are awake and carrying out our daily activities. The heart itself it a muscular organ and is pumping every second during the entire lifetime of a person to keep him alive. The muscles in our lungs do not stop working too when we are sleeping.

73. **(C)** The leaf like part of the plant embryo is called cotyledon.

74. **(B)** Various insects, butterflies, birds, animals and wind etc are also pollinators.

75. **(A)** Chewed food is lumped together by the action of the tongue and the saliva. The tongue helps to roll the food particles into ball. The balls can then pass through the gullet and into the stomach easily.

76. **(D)** Chlorophyll is the green pigment found in the leaves of a plant that helps it to trap sunlight.

77. **(D)** The roots of sweet potatoes are edible.

78. **(C)** The picture shows a wriggler, the young of a mosquito.

79. **(B)** Matter has mass and occupies space. However, not all matter has definite volume.

80. **(D)** The stone occupies the space in the beaker of water. The amount of space it occupies is called volume.

81. **(B)** Matter is anything that has mass and takes up space. Oxygen is matter because it occupies space and has mass. Having no definite shape is not considered a factor to determine if oxygen is matter.

82. **(D)** The tiny openings, also known as stomata, allow the exchange of gases with the surroundings to take place. Air containing oxygen and carbon dioxide enters and exists the openings during the processes of photosynthesis and respiration. At the same time, when the leaf transpires, it gives out water vapour through the stomata.

83. **(B)** Only the sun and lightning give out light on their own.

84. **(D)** The sun rises in the east. Hence, the shadow cast towards the west. Since the shadow of Tree 1 lies in the west, the time should be around morning. The shadow of the tree is the shortest during noon which can be shown for Tree 2. The shadow of Tree 3 lies in the east and the time should be around late afternoon to evening.

85. **(C)** Plants with weak stems, need to climb on a support so that its leaves will receive optimum sunlight.

86. **(B)** The dolphin is an aquatic mammal. It gives to youngones and breathes through its lungs.

87. **(D)** A crow bar is a straight iron or steel bar with the point flattened and sometimes set at an angle, used as a lever.

88. **(A)** A thin, flat with a large surface area makes it suitable for trapping sunlight to make food.

89. **(D)** Caterpillar is a herbivore. Snake, lizard and frog are carnivore.

90. **(C)** Cholera is a disease caused due to the entry of germs through contaminated water.

GENERAL AWARENESS

91. **(B)**	92. **(B)**	93. **(D)**
94. **(A)**	95. **(A)**	96. **(B)**
97. **(C)**	98. **(B)**	99. **(C)**
100. **(D)**		

The End