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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: UN426

Solutions for Class : 5

Mathematics

1. **(D)** Number of rows of mango trees = 16

Number of mango trees in each row = 325

So, total number of mango trees

= 325 × 16 = 5200

Number of rows cut down = 6

So, number of mango trees cut down = 6

= 6 × 325 = 1950

Therefore, total number of mango trees left = 5200 – 1950 = 3250

2. **(D)** The required fraction $= \frac{55 \text{ minutes}}{2\frac{1}{4} \text{ hours}}$

$= \frac{55}{\frac{9}{4} \times 60} = \frac{55 \times 4}{9 \times 60} = \frac{11}{27}$

3. **(A)** No. of questions = 50

No. of correct answers = 38

No. of incorrect answers = 12

∴ The required percentage of questions answered incorrectly

$= \frac{12}{50} \times 100\% = 24\%$

4. **(A)** Ratio of length and breadth = 5 : 2

Area = 5×2 = 10 sq.units

Given area = 1690 cm^2

10 sq. units $\rightarrow$ 1690 cm^2

1 sq. unit $\rightarrow \frac{1690}{10} = 169\,cm$

1 unit = 13 cm

Perimeter = 2×7 units = 14 units

∴ Perimeter = 14×13 = 182 cm

5. **Delete**

6. **(B)** Repetition of Roman numerals means addition but numerals like V, L and D be repeated.

7. **(A)** $\frac{(11+A)}{(97-94)} = 5$. Solving the denominator, we get 97 – 94 = 3. Now to get the result equal (97 – 94) to 5, 3 must be divide by 15. And to obtain 15 in the numerator, we must add 4, such that 4 + 11 = 15. This A = 4.

8. **(D)** $\frac{1}{4} = 25\%$, $\frac{3}{10} = 30\%$,

$\frac{2}{10} = 20\%$, and $\frac{1}{2} = 50\%$,

∴ Of the given options $\frac{1}{2}$ off the normal price (i.e., 50 % discount] is the bigger discount.

9. **(B)** (A) Perimeter of equil. Δ = 9 × 3 = 27

Perimeter of square = 12 × 4 = 48

(B) Perimeter of equil. Δ = 12 × 3 = 36

Perimeter of square = 9 × 4 = 36

(C) Perimeter of equil. Δ = 15 × 3 = 45

Perimeter of square = 40 .

10. **(B)** Let x grams of sugar is needed.

$\frac{x}{750} = \frac{1}{3} \Rightarrow x = 250\,grams.$

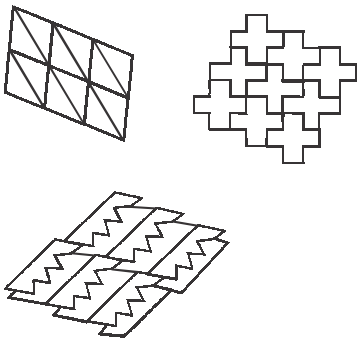
11. **(B)** $\frac{13}{4}+\frac{25}{4}+\square = \frac{101}{10}$

$\Rightarrow \frac{13+25}{4}+\square = \frac{101}{10}$

$\Rightarrow \square = \frac{101}{10}-\frac{38}{4}=\frac{101}{10}-\frac{19}{2}$

$=\frac{101-95}{10}=\frac{6}{10}$

12. **(C)**



13. **(B)** Place value of 1 in 100000000 is 10 crore.

[as 100000000 = 10 x 10000000 = 10 crore]

So, the required number to be added to 3543467 to get 10 crore

= 100000000 - 3543467 = 96456533

14. **(C)** In the given figure there are 3 angles which are larger than a right angle.

15. **(A)** P = ₹ 1800, A = ₹ 2700,

T = 10 years

$I = A - P = ₹(2700 - 1800) = ₹\ 900$

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

16. **(B)** The height of a wooden block

$= 12.28\ cm \approx 12\ cm$

$\therefore$ The height of 14 similar blocks stacked on top $= 12 \times 14 = 168\ cm$

17. **(B)** M = L. C. M. of 18, 24, 40 = 360

N = H. C. F of 60, 180, 360 = 60

$\therefore 2M + 15N = 1620$

$\therefore$ The digit in thousands place is 1.

18. **(A)** DCLV = 500 + 100 + 50 + 5 = 655

XLVI = (50 – 10) + 5 + 1 = 46

MDCL = 1000 + 500 + 100 + 50

= 1650 ≠ 1560

So, only (i) and (ii) are correct.

19. **(B)** $\text{Length} = \frac{\text{Area}}{\text{breadth}} = \frac{120\ sq\ m}{5\ m} = 24\ m$

20. **(B)** Number of circles = 20.

Number of squares = 8.

$\bigcirc - \square = 12$

$(\bigcirc - \square) : \bigcirc = 12 : 20$

$= 3 : 5.$

21. **(D)** 132 x 20 = 2640, 100 x 40 = 4000

142 x 30 = 4260, 123 x 50 = 6150

$\therefore$ 123 x 50 has the greatest product.

22. **(A)** (11, 111) are the pair of coprime numbers

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

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

= 62.72 – 45.63 = 17.09

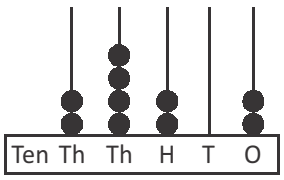
24. **(C)** Distance to which Victor can kick the football = $7\frac{5}{7}ft = \frac{54}{7}ft$

Distance to which Leon can kick the same football = $10\frac{4}{5}ft = \frac{54}{5}ft$

Therefore, the number of times the height to which Victor kicks the ball as compared to Leon.

$= \frac{54}{7} \div \frac{54}{5} = \frac{54}{7} \times \frac{5}{54} = \frac{5}{7}$

25. **(C)**



The number represented by abacus = 24202

Now, to form a number that lies between 24631 and 25212 a ring in the thousand string must be added i.e. 1000 must be added to 24202, we get 24202 + 1000 = 25202

[as 24631 < 25202 < 25212]

26. **(B)** Area of square = 144 cm^2

$\therefore$ Its side = 12 cm

Hence, the required perimeter

$= 5 \times 12\ cm = 60\ cm$

27. **(B)** Average $= \frac{66+14+16}{8}$ years

$= 12$ years

28. **(D)** Let the numbers be 24 and 240.

Then their H.C.F. = 24

and L. C. M. = 240

Hence the required numbers are 24 and 240.

29. **(B)** Sum of two numbers = 1470

Difference = 150

Let the numbers be x, y

$\Rightarrow$ x + y = 1470 and x – y = 150

$\Rightarrow$ x + y + x – y = 1470 + 150

$\Rightarrow$ 2x = 1620

$\therefore$ x = 810

$\Rightarrow$ y = 660

$\therefore$ The two numbers are 810, 660

Hence, the greater number is 810.

30. **(B)** Ratio of doves to parrots = 13 : 12

Number of parrots = 108

Let the total number of doves and parrots = x

$$\Rightarrow \frac{12}{25} \times x = 108$$

$$\Rightarrow x = \cancel{108}^{9} \times \frac{25}{\cancel{12}}$$

$\therefore$ x = 225

Hence, number of doves = 225 – 108 = 117

31. **(C)** According to the problem,

M = 63549 and N = 149500.

Their sum = 63549 + 149500 = 213049

32. **(D)** The given digits are 7, 4, 0, 5

Number of digits required in the number = 7

Greatest number among the given digits = 7

The greatest number formed by using 4, 0 and 5 is 540. Also it is even.

Now, 7 is the greatest among the given digits, so it will be repeated four times to form the required 7- digit number.

$\therefore$ The required number = 7777540

33. **(B)** There are four sides. So, it cannot be circle or triangle. Now, it has 2 pairs of equal sides. So it is a rectangle as the square has all its four sides equal.

34. **(D)** 6 squares out of 32 are coloured.

$\therefore$ The required percentage

$$= \frac{6}{32} \times 100\% = 18.75\%$$

35. **(A)** Let x be the distance on the map

300 : x = 30 : 1

$$\frac{300}{x} = \frac{30}{1} \Rightarrow x = 10\ cm$$

36. **(D)** Given area of rectangle = 14 cm^2

Hence, 14 squares can be fitted in that rectangle.

37. **(D)** Fraction $= \frac{8}{15}$

38. **(B)** 1 yard = 0.914 m

$\Rightarrow$ 22 yards = 22 × 0.914 m

= 20.108 m

39. **(C)** Fraction of pizza Karan ate $= \frac{1}{3}$

Fraction of pizza Kiran ate $= \frac{1}{6}$

Remaining pizza $= 1 - \frac{1}{3} - \frac{1}{6}$

$$= \frac{6-2-1}{6} = \frac{3}{6} = \frac{1}{2}$$

40. **(D)** Option (A) shows $3 \times \frac{2}{3}$ shaded region

Option (B) shows $2 \times \frac{1}{2}$ shaded region

Option (C) shows $3 \times \frac{1}{4}$ shaded region

Option (D) shows $2 \times \frac{1}{5}$ shaded region

41. **(B)** Original number = 890436

New number = 890036

Then the resulting number is 400 less than by given number.

42. **(C)** The maximum number of sundays that a month can have is 5.

43. **(A)** Express each of the decimals as fractions:

$$0.25 = \frac{25}{100} = \frac{5}{20} = \frac{1}{4}$$

$$0.375 = \frac{375}{1000} = \frac{3}{8}$$

$$0.625 = \frac{625}{1000} = \frac{5}{8}$$

44. **(C)** Remaining land = $\frac{1}{2}$ after selling.

Half of the remaining land he gave to his son = $\frac{1}{4}$

$\therefore$ Remaining land = $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$

45. **(D)** From the given figure, the number of squares shaded = No. of full squares + $\frac{\text{no. of squares}}{2}$ + no. of half squares

$$= 10 + \frac{2 \times 4}{2} + 2 \times \frac{1}{2} = 15$$

Area of each grid square = 2 cm^2

$\therefore$ The area of shaded figure
= 15 × 2 cm^2 = 30 cm^2

General Science

46. **(D)** The given figure shows bending of plant towards sunlight, this indicates that the plant is showing response towards stimulus.

47. **(B)** Joints of backbone are called gliding joints. If there is any problem in the backbone the movement of the body become difficult.

48. **(D)** Scissors, icetongs and hammer are examples of a lever.

49. **(D)** When the moon comes between the sun and the earth it causes solar eclipse.

50. **(C)** Cotyledon or seed leaves provide food for the baby plant.

51. **(A)** To separate salt crystals from the salt, water evaporation method of separation is used. When salt solution is heated the water gets evaporated leaving the salt behind.

52. **(A)** Tetanus can occur due to the entry of germs through cut skin if not treated.

53. **(A)** Some fruits disperse their seeds by explosive mechanism. They dry up and burst to push the seeds out from the fruits.

54. **(B)** An inclined plane acts as a ramp and help to move the box out of truck.

55. **(C)** Tortoise, Crab and Prawn have their bodies covered with shells.

56. **(A)** Ball and socket joint in the shoulder favours rotation of arm in a full circle.

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)** Femur is the largest bone of the body.

59. **(B)** Self explanatory.

60. **(B)** The streamlined body shape of aquatic animals reduce resistance in water.

61. **(A)** The deficiency of iodine leads to goitre. It results in swelling in the neck region.

62. **(D)** The sudden involuntary actions in response to a stimulus are called reflex actions.

63. **(D)** The carrot is an underground root. Like all roots, it absorbs water and minerals, holds the plant firmly in the soil and also stores excess food made by the leaves in plants.

64. **(D)** Grain ⟶ Rat ⟶ Snake ⟶ Eagle

65. **(A)** Scissors belongs to Ist order level.

66. **(A)** We can rotate or move our shoulder 360°

67. **(A)** Cockroach has a pair of antennae to help it sense its surroundings.

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

69. **(D)** The correct sequence that should be followed while giving first aid is (iv), (ii), (iii), (i), (v).

70. **(A)** In the given figure 'X' is fulcrum.

71. **(C)** Carbon dioxide is an example of gaseous state and so can be placed under Z.

72. **(C)** It is the shadow of the moon on the sun.

73. **(D)** Limestone is a sedimentary rock. It contains fossils in them.

74. **(B)** In the given pie chart 'X' represents nitrogen and Y carbon dioxide.

75. **(B)** Granite is a type of igneous rock.

76. **(B)** 'S' in the given figure is ball and socket joint.

77. **(A)** R is a plant and it is a producer and the Earth's natural resource. P is an omnivore. It feeds on plants (R) and animals (Q and S). Q and S are herbivores.

78. **(A)** Tadpole breathe through gills.

79. **(D)** Rose, hibiscus, bougainvillea and sugarcane can be grown from stem cuttings.

80. **(C)** The densities of wood is less than the density of water, hence it floats on water.

81. **(B)** Without the small intestine, digestion is incomplete. Also, the body is unable to absorb any digested food efficiently. Food is ground by the teeth in the mouth and further churned to a pulp called chyme in the stomach, not the small intestine.

82. **(A)** Oxygen gas is used up in the burning of things and in the process of respiration.

83. **(A)** (4, 1, 2, 3) A mixture of iron fillings, sand and sugar are separated first by

1) Using a magnet to separate iron fillings,

2) Adding water to the mixture,

3) Filtering to remove sand and then

4) Evaporating the mixture to obtain sugar crystals.

84. **(A)** Beef, fish and chicken are rich in proteins.

85. **(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.

86. **(A)** Vulture have a sharp curved pointed hooked beak.

87. **(C)** Frog is an amphibian it uses its lungs to breathe in air when it is on land and skin to breath when it is in water.

88. **(C)** The leave grow after the growth of the shoot system of the seedlings will appear first.

89. **(A)** Frictional force prevents from falling on a slippery floor.

90. **(D)** In a wheel-and-axle, a wheel is connected to a rod (known as the axle) rigidly. The handle of the screw driver is a wheel while the shaft is axle.

91. **(B)** 92. **(B)** 93. **(D)**

94. **(C)** 95. **(A)** 96. **(B)**

97. **(B)** 98. **(C)** 99. **(A)**

100. **(A)**