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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION - 2013

SOLUTIONS FOR CLASS : 5

Mathematics

1. (B) $200\times75=25\times\boxed{50}\times4\times3$

2. (C) AB // ID, AJ // CD, BC // IJ, EH // GF, HG // EF.

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

4. (B) The value of digit '3' in the number 239766 is 30,000.

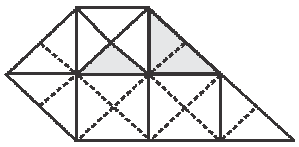
   The value of digit '6' in the number 45655 is 600.

   And, $600\times50=30{,}000$.

5. (C) $2\times\boxed{?}=\frac{2}{5}\times\frac{1}{13}$

   $\Rightarrow 2\times\boxed{?}=\frac{2}{65}\Rightarrow\boxed{?}=\frac{2}{65}\div2$

   $\therefore$ The missing number $=\frac{2}{65}\times\frac{1}{2}=\frac{1}{65}$

6. (B) 

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

7. (B) Each division $=\frac{1}{16}$

   So, point A $=\frac{59}{16}=3\frac{11}{16}$

8. (B) $\frac{375}{1000}=\frac{15}{40}=\frac{3}{8}$

9. (D) Multiples of 6 greater the 50 and smaller than 75 are 54, 60, 66 and 72.

   9 divides 66 leaving a remainder 3.

10. (D) Measure of the angle in option (D) is the smallest.

11. (A) The smallest possible 6-digit number that can be formed using the given digits is 235679. The digit 6 is in the hundreds place.

12. (A) $93.528=90+3+\frac{5}{10}+\frac{2}{100}+\frac{8}{1000}$

    $=90+3+\frac{5}{10}+\frac{1}{50}+\frac{1}{125}$

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

14. (B) Age of Jack = 33 years

    Age of Jill $=33-7=26$ years

    Total age of Jack and Jill $=33+26=59$ years.

    Total age in 18 years time $=59+36=95$ years .

15. (B) The required largest area of the wooden plank after smoothing its sides and corners

    $=34349\left(\frac{13-3}{13}\right)$

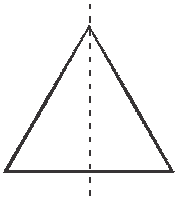
    $=3439\times\frac{10}{3}$

    $=26422.3077\approx26422.31$

16. (B) $\frac{\left(\frac{1}{2}+\frac{1}{3}\right)\left(\frac{3}{6}+\frac{2}{6}\right)}{\left(\frac{1}{4}+\frac{2}{5}\right)\left(\frac{5}{20}+\frac{8}{20}\right)}=\frac{(5/6)}{(13/20)}=\frac{50}{39}$

17. (C) It is clear that A and D are not divisible by 9 different primes. The next number is $223092870=2\times3\times5\times7\times11\times17\times19\times23$

18. (B) 9.65, 8.298, 5.97, 0.23 are in descending order.

19. (C) 

20. (B) 3 min _____ 60 words

60 min —— $60 \times 20 = 1200$ words

21. (C) $\left(\frac{1}{4}+\frac{1}{6}\right)=\frac{5}{12}$

22. (C) If there are 80 pencils, then

$80 \div 4 = 20$

Verification : $20 \times 3 + 20 = 80$ pencils.

23. (B) $\angle AOB = \angle BOC - \angle AOC$

$= 134^o - 90^o = 44^o$

24. (B) A rectangle has two pairs of parallel lines.

25. (C) $(8 + 4 + 2 + ?)$ cm = 19 cm

$(14 + ?)$ cm = 19 cm

$\therefore$ The length of the missing side

$= (19 - 14)$ cm = 5 cm

26. (D) Volume of 1 cube $= 2^3 = 8$ cm^3

Volume of 11 cubes $= 11 \times 8 = 88$ cm^3

27. (B) $180^o + 156^o$ is the required measure of the angle.

28. (C) $\frac{3}{4}\times 9000 - \frac{2}{3}\times 900$

$= 3\times 2250 - 2\times 300 = 6150$

29. (D) 7 km 70 m = 7070 m

2 weeks = 14 days

Distance he ran in day $= \frac{7070}{14} = 505$ m

30. (C) In the number 243.649, the value of 4 in the tens place is 1000 times the value of 4 in the hundredths place.

31. (D) $\frac{4}{5}\times\frac{1}{8}=\frac{1}{5\times 2}=\frac{1}{10}l$

32. (B) Volume $= 36$ cm$^2 \times 6$ cm $= 216$ cm^3

33. (C) $15 \times 3 = 45$

$\therefore\ 22.5 \times 3 = 67.5$ m

34. (D) Mass of biscuits in 1 bag = 12.4 kg

$\Rightarrow$ Mass of biscuits in $2\frac{1}{2}$ bags

$= 12\frac{2}{5}\times\frac{5}{2} = 31$ kg

Number of packets $= \frac{31\times 1000}{62} = 500$

35. (A) $\frac{1}{6}+\frac{1}{6}=\frac{2}{6}=\frac{1}{3}$

36. (C) $1\frac{2}{5}+2\frac{2}{3}=\frac{7}{5}+\frac{8}{3}$

$= \frac{21+40}{15} = \frac{61}{15} = 4\frac{1}{15}$ kg

37. (B)
$$\begin{array}{r} 1.000 \\ -0.444 \\ \hline 0.556 \end{array}$$

38. (C) $\frac{1}{2}(12\times 7)=\frac{1}{2}\times 12\times 7$

$= 6 \times 7 = 42$ cm^2

39. (A)
$$\begin{array}{r} 1847525 \\ +\ 2305218 \\ \hline 4152743 \end{array}$$

$\therefore$ Number of children

$= 51210913 - 4152743 = 47058170$

40. (C) They can all be exactly divided by 3.

41. (D) $\frac{1}{7}+9=\frac{1+63}{7}=\frac{64}{7}$

42. (B) $0.777 = 7 \times 0.111 = 7 \times \frac{1}{9} = \frac{7}{9}$.

43. (B) $\frac{17.28\div 12}{3.6\times 0.2}=\frac{1.44}{0.72}=2$

44. (B) 3 times

45. (A) Perimeter of square $= 4 \times 4.5$ cm $= 18.0$ cm

Perimeter of regular hexagon = Perimeter of square

$\therefore$ Each side of hexagon $= \frac{18}{6} = 3$ cm

General Science

46. (D) Pods explode when they are dry. The seeds get thrown off and are scattered away.

47. (C) A flowering plant reproduces from a seed. A seed germinates into a seedling and then grows into a young plant. Young plant grows into an adult plant and develops flowers. Flowers develop into fruits and produce seeds.

48. (D) The most appropriate title should be respiratory organs. Moist skin is used for breathing in earthworm and frog, spiracles and trachea are used by grasshopper and cockroach. Gills and spiracles are used by fish, prawns and cockroach.

49. (C) The disease is called scurvy. Vitamin 'C' protects many body tissues. Deficiency of this vitamin leads to bleeding of gums, swelling of joints and wounds that do not heal.

50. (D) Snakes and worms do not have legs. A snake moves by curving, straightening and by shortening and elongating their bodies.

51. (C) The watervapour in air is cooled when it comes in contact with the outer surface of the glass with ice cubes. The watervapour in air changes back to water. This is called condensation.

52. (B) Air pressure is used to sip the drink from the bottle through a straw. When you suck

in air from the straw, air pressure inside the straw decreases. The air pressure on the surface of the drink is now more than the air pressure inside the straw. It forces the drink into the straw and into your mouth.

53. (C) In option (C), stretching needs force to pull the object from both the sides.

54. (C) Conglomerates are sedimentary rocks. It looks like pebble cemented together with minerals. They are formed when the lower layers of sediments consist of pebbles and sand.

55. (D) Planting trees or afforestation is very effective in preventing soil erosion, specially in hilly areas. Grass grown on slopes in hilly areas prevents soil erosion by water flowing down the slopes.

56. (C) Carbon dioxide gas is used in fizzy drinks to get tingling taste.

57. (C) A wheel barrow, a bottle opener and a paper cutter are examples of II order of levers.

58. (B) Animals have body coverings to protect their soft bodies from injury and from attacks by enemies.

59. (A) In the given illustrations 'P' shows the correct flow of gases from one organism to the other i.e., Green plants give out oxygen during photosynthesis and animals give out carbondioxide during respiration.

60. (B) Coconut seeds are dispersed by wind. The fruit has air trapped in between its husk. This makes it light and easy to float. Water carries these fruits and seeds to far off places.

61. (B) The classification is based on the way they reproduce. Potato, ginger and onion are underground modified stems and they reproduce from these modified stems. Rose, hibiscus and sugarcane reproduce from stem cuttings.

62. (D) Distillation is used to remove soluble impurities in water.

63. (C) The given figure is that of a satellite.

64. (A) Mustard is a rabi crop. It grows well in winter. Winter crops are called rabi crops.

65. (A) The top layer of soil is rich with humus. It is soft, light and fertile.

66. (C) Soluble impurities are removed by evaporation. Only water gets evaporated and the amount of salt will remain the same.

67. (D) In the solar system, the planet earth revolves around the sun and the moon, revolves around the earth.

68. (D) Wheels fixed to the board have a rod in the centre known as an axle. In the given examples or illustrations the boy on the skating board is of using a wheel and an axle.

69. (C) Muscles pull bones. In the given figure 'R' represents muscles. Two muscles called biceps and triceps move our lower arm.

70. (C) A screw looks like a nail with grooves cut in it. It has a winding edge called a thread. This winding edge is actually an inclined plane.

71. (B) Soya beans are pulses. Pulses are rich in proteins.

72. (C) The circulatory system carries food and oxygen to all parts of the body and collects water and other materials through blood vessels.

73. (C) Animals move from place to place in search of food, shelter and for their protection.

74. (D) Coconuts are light and have an outer covering that does not get soaked in water and are dispersed by water.

75. (B) Knees and elbows have hinge joints. Hinge joints are very strong, but can only move in one directions.

76. (C) The cockroach breathes through spiracles or air holes on its abdomen.

77. (C) The arctic tern travels 17,000 km every year from the arctic to the antarctica in winter. In summer it travels back to the arctic. This long journey that these animals take up every year is called migration.

78. (D) Air is a mixture of gases. About 78% is nitrogen, 21% is oxygen and the remaining is mainly carbondioxide and inert gases.

79. (C) Soil is formed by the breaking down of rocks into smaller pieces. This process of wearing away of rocks is called weathering.

80. (A) Lizards use four short legs to crawl on the ground. It is able to walk upside down on ceilings due to the presence of suction pads on its feet.

81. (C) Iron rod is a solid. Most solids are hard, and have fixed shape and volume. Inside a solid, the molecules are closely packed together.

82. (B) In the given figure X is load. Y - fulcrum and Z - effort. Pliers are the first order levers.

83. (C) Sometimes joints such as the ankle or wrist can get twisted. The joint swells up and is very painful. It is called a sprain. Ice packs can be used to bring down the swelling.

84. (C) A piece of wood when dropped in water will float. When you push the wood down into the water, you feel a buoyant force or upthrust of water acting on your hand and making it move upward.

85. (A) Satellites are used for sending telephone signals to far off places. It is used to study the atmospheric conditions to forecast weather.

86. (D) A balanced diet should have more carbohydrates. Carbohydrates are energy giving foods. Proteins are body building foods and are required in less quantity than carbohydrates. Fats give more energy and are required in very less quantities.

87. (B) A seed needs enough water, air and temperature (heat) to germinate.

88. (A) In the given table, X is a stick insect, Y is a leaf insect and Z is a chameleon.

89. (D) The moon also pulls all things towards itself. But since it is much smaller than the earth, the force of gravity is less. It is only about $\frac{1}{6}$ of that on the earth.

90. (C) Deficiency of iodine leads to goitre. The symptoms of goitre is swelling in the neck region. Fish is rich in iodine.