



**UNIFIED COUNCIL**

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**NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION**

**Paper Code: UN 415**

**Solutions for Class : 5**

**Mathematics**

1. (C) According to the problem, the number of pens is exactly divisible by 18.

Also, the number is 5 less to be divisible by 19.

∴ The required number is  $19 \times 5 - 5$   
 $= 95 - 5 = 90$ , which is exactly divisible by 18

2. (A) The required number

$$= 3 \frac{3}{10} - 2 \frac{2}{5}$$
$$= \frac{33}{10} - \frac{12}{5} = \frac{33}{10} - \frac{24}{10}$$
$$= \frac{33 - 24}{10} = \frac{9}{10}$$

3. (A)  $14 + \frac{8}{10} + \frac{108}{100} + \frac{345}{1000}$

$$= 14 + 0.8 + 1.08 + 0.345 = 16.225$$

$$\begin{array}{r} 14.000 \\ 0.800 \\ 1.080 \\ (+) 0.345 \\ \hline 16.225 \end{array}$$

4. (A) In a quadrilateral, the sum of all the angles is  $360^\circ$ .

$$\text{So, } \angle g = 360^\circ - 138^\circ - 90^\circ - 90^\circ$$
$$= 360^\circ - 318^\circ = 42^\circ$$

5. (A) The average of X and Y = 108

$$\text{So, } \frac{X+Y}{2} = 108$$

$$\Rightarrow X + Y = 108 \times 2 = 216 \rightarrow (1)$$

$$300\% X = Y \text{ i.e., } Y = 3X$$

$$X + Y = 216$$

$$\Rightarrow X + 3X = 216$$

$$\Rightarrow 4X = 216$$

$$\Rightarrow X = \frac{216}{4} = 54$$

The required difference

$$= Y - X = 3X - X$$

$$= 2X = 2 \times 54 = 108$$

6. (D) Ratio of sides of a triangle is 3 : 4 : 5

The longest side = 15 cm

$$= 5 \text{ units}$$

$$\therefore 1 \text{ unit} = \frac{15}{5} \text{ cm} = 3 \text{ cm}$$

Hence, 3 units = 9 cm

and 4 units = 12 cm

Therefore, perimeter of the triangle

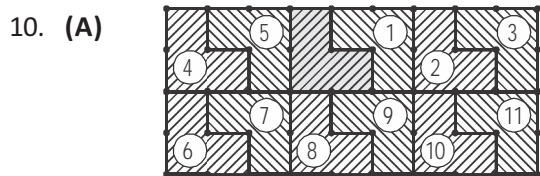
$$= (9 + 12 + 15) \text{ cm}$$

$$= 36 \text{ cm}$$

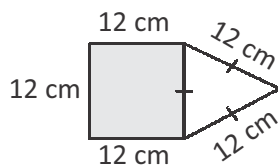
7. (C) The sum of 82349 and 8268 = 90617.

The smallest possible 5-digit even number that can be formed using the digits of the sum = 10796.

8. (B) L. C. M. of 45 and 50 is  
 $5 \times 9 \times 10 = 450 = P$   
 $\therefore 10P + 100 = 450 \times 10 + 100$   
 $= 4500 + 100 = 4600$
9. (D) Actual :  $14.36 \times 23 = 330.28$   
 Addition :  $14.36 + 23 = 37.36$   
 The difference between his answer and the actual answer  
 $= 330.28 - 37.36 = 292.92$



- $\therefore$  11 more such basic shapes fill up the given box.
11. (B) Length ( $l$ ), Breadth ( $b$ )  
 $\Rightarrow P = 2(l + b)$  units  
 When length and breadth are doubled,  
 $l \rightarrow 2l$   $b \rightarrow 2b$   
 Then  $P = 2(2l + 2b)$   
 $= 2 \times [2(l + b)]$   
 $= 2 \times P$   
 i.e., perimeter is doubled.
12. (D) The missing digit according to the given expansion is 7.
13. (B) H.C.F. of 11, 33 and 88 is 11.  
 L.C.M. of 11, 33 and 88 is  $11 \times 3 \times 8$   
 $= 11 \times 24 = \text{H.C.F.} \times 24$
14. (D)  $0.3 \div 0.3 \times 3 = 1 \times 3 = 3$
15. (C) The sum of the three angles in a triangle is  $180^\circ$  or 2 right angles.
16. (B) Area of square =  $144 \text{ cm}^2$   
 $\Rightarrow$  Side =  $\sqrt{144} \text{ cm} = 12 \text{ cm}$   
 The given triangle is equilateral.



Perimeter =  $(12 + 12 + 12 + 12 + 12) \text{ cm}$   
 $= 60 \text{ cm}$

17. (D) In evaluation of a numerical expression, division (D), multiplication (M), addition (A) and subtraction (S) have to be performed in order.
18. (A) The product of factors in the prime factorisation of a number  
 $= (2 \times 2 \times 2) \times (3 \times 3 \times 3 \times 3) \times 5$   
 $\therefore$  The number = The product of the given prime factors = 3240
19. (A) Part of the book read =  $\frac{3}{5}$   
 $\therefore$  Part of the book left to be read  
 $= 1 - \frac{3}{5} = \frac{2}{5}$   
 No. of pages left to be read = 80  
 $\therefore \frac{2}{5}$  part = 80  
 $\therefore$  No. of pages in the book  
 $= 80 \times \frac{5}{2}$   
 $= 40 \times 5$   
 $= 200$
20. (C) Let the third number be 100.  
 Required % =  $\frac{120 \times 100}{150} = 80$
21. (C)  $684 > 68.4 > 6.84 > 0.684$   
 $\therefore R > Q > S > P$
22. (B) A radius of a circle joins its centre to a point on it.
23. (D) Volume of 4 similar cubes of side 5 cm  
 $= 4 \times 5 \times 5 \times 5 \text{ cm}^3 = 500 \text{ cm}^3$
24. (C)  $909000 \div 9090 = 159 - \boxed{?}$   
 $100 = 159 - \boxed{?}$   
 $\therefore$  The missing number is  $159 - 100 = 59$ .
25. (B) Consecutive prime numbers that differ by 2 are called twin primes.
26. (C) From the given decimal number line, the distance between two consecutive markings is  $6.5 - 6.37 = 0.13$   
 $\therefore$  The value of P is  
 $6.5 + 0.13 = 6.63$

The value of Q is

$$6.63 + 0.13 = 6.76$$

The value of R is

$$6.76 + 0.13 = 6.89$$

$$\begin{aligned}\therefore P + Q - R &= 6.63 + 6.76 - 6.89 \\ &= 6.50 = 6.5\end{aligned}$$

27. (B)  $\frac{2}{5} \rightarrow 48$

$$\frac{1}{5} \rightarrow 48 \div 2 = 24$$

$$\frac{5}{5} = 24 \times 5 = 120$$

$$\begin{aligned}\therefore \frac{3}{5} \text{ of } 120 &= \frac{3}{5} \times 120 \\ &= 3 \times 24 \\ &= 72\end{aligned}$$

28. (A) Speed = 45 km/h

$$\text{Time} = 36 \text{ minutes} = \frac{36}{60} \text{ hr}$$

$$\begin{aligned}\text{Distance} &= \text{Speed} \times \text{Time} \\ &= 45 \times \frac{36}{60} = 27 \text{ km}\end{aligned}$$

29. (B) Six hundred one thousand and five hundred = 601500

30. (B) After 10 hours, the time would be 2 o'clock.

In 12 hours, the hour hand moves through  $360^\circ$ .

$$\therefore \text{For 10 hours, the hour hand moves through } \frac{360^\circ}{12} \times 10 = 300^\circ$$

31. (B) Score of Pavan =  $76 = \frac{4}{5}$  of score of Prateek

$$\frac{4}{5} \rightarrow 76$$

$$\frac{5}{5} \rightarrow 76 \times \frac{5}{4}$$

$$= 19 \times 5 = 95$$

$$\therefore \text{Their total marks} = 76 + 95 = 171$$

32. (C)

7	6	5	4	3	2	1
T.L	L	T.Th	Th	H	T	O

33. (C)  $25\% \text{ of } 50 = \frac{25}{100} \times 50$   
 $= 12.5$

$$250\% \text{ of } 20 = \frac{250}{100} \times 20$$
$$= 50$$

$$\begin{aligned}\therefore \text{The required difference} \\ &= 50 - 12.5 = 37.5\end{aligned}$$

34. (C)

$$\begin{array}{r} 3 \overline{) 3, 6, x} \\ 2 \overline{) 1, 2, \frac{x}{3}} \\ 1, 1, \frac{x}{6} \end{array}$$

Given that LCM of 3, 6,  $x$  is 18,

$$\therefore \text{LCM} = 3 \times 2 \times \frac{x}{6} = 18, \quad x = 18.$$

35. (A)

From the given figure,

$$\begin{aligned}\angle AOB &= \angle COB - \angle COA \\ &= 134^\circ - 90^\circ \\ &= 44^\circ\end{aligned}$$

36. (C)

$$\begin{aligned}453.07 &= 400 + 50 + 3 + \frac{7}{100} \\ &= 400 + 50 + 3 + 0.07\end{aligned}$$

$$\begin{aligned}\text{Required difference} &= 50 - 0.07 \\ &= 49.93\end{aligned}$$

37. (B)

$$\frac{2 \times 2}{5 \times 2} = \frac{4}{10}, \quad \frac{5 \times 5}{2 \times 5} = \frac{25}{10}, \quad \frac{7 \times 2}{5 \times 2} = \frac{4}{10}$$

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

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

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

$$\frac{14}{10} \left( \text{i.e., } \frac{2}{5} \right) \text{ and } \frac{25}{10} \left( \text{i.e., } \frac{5}{2} \right)$$

38. (C) Multiples of 10 from 10 to 190  
 = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,  
 120, 130, 140, 150, 160, 170, 180, 190

$$\text{Average} = \frac{\text{Sum of multiples}}{19} = \frac{1900}{19} = 100$$

39. (D) The factors of 81: (1), (3), (9), (27), 81

The factors of 108: (1), 2, (3), 4, 6, (9)  
 12, 18, (27), 36, 54, 108

The highest common factor of 81 and 108 is 27.

$$\therefore p + 3 = 27$$

$$p = 24.$$

40. (C) 23 weeks = 7 × 23 days  
 = 161 days

$$\begin{aligned} \Rightarrow 23 \text{ weeks} - 16 \text{ days} &= (161 - 16) \text{ days} \\ &= 145 \text{ days} \\ &= (140 + 5) \text{ days} \\ &= ((7 \times 20) + 5) \text{ days} \\ &= 20 \text{ weeks } 5 \text{ days} \end{aligned}$$

41. (C) A : B = 4 : 3

$$\text{Height of B} = \frac{3}{7} (\text{Total height}) = 1.2 \text{ m}$$

$$\begin{aligned} \text{Total height} &= \frac{7}{3} \times 1.2 \text{ m} \\ &= 2.8 \text{ m} \end{aligned}$$

$$\begin{aligned} \therefore \text{Height of A} &= \frac{4}{7} \times 2.8 \text{ m} \\ &= 1.6 \text{ m} \end{aligned}$$

42. (A) 1 Kg = 1000 gm; 1 l = 1000 ml;  
 1 km = 1000 m

$$\begin{aligned} \text{(i)} \quad 604 \text{ g} \times 100 &= 60400 \text{ g} \\ &= 60.4 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad 415 \text{ ml} \times 10 &= 4150 \text{ ml} \\ &= 41.5 \text{ l} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad 0.25 \text{ km} \times 100 &= 25 \text{ km} \\ &= 25000 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad 1.12 \text{ l} \times 10 &= 11.2 \text{ l} \\ &= (11.2 \times 1000) \text{ ml} \\ &= 11200 \text{ ml} \end{aligned}$$

$\therefore 604 \text{ g} \times 100 = 60.4 \text{ kg}$  is the correct statement.

43. (C) Total square = 12

Shaded squares = 6 ( $\because$  4 half shaded parts = 2 complete shaded squares)

$\therefore$  Percentage of shaded parts

$$\begin{aligned} &= \frac{6}{12} \times 100\% \\ &= 50\% \end{aligned}$$

$$\begin{aligned} 44. \text{ (A)} \quad 9\frac{3}{10} - 4\frac{1}{5} \\ &= \frac{93}{10} - \frac{21}{5} \\ &= \frac{93 - (21 \times 2)}{10} = \frac{93 - 42}{10} \\ &= \frac{51}{10} = 5\frac{1}{10} \end{aligned}$$

45. (D) 9.801 × 100 = 980.1

$$5.243 \times 10 = 52.43$$

$$96.4 \times 1000 = 96400$$

$$28.474 \times 100 = 2847.4$$

$\therefore$  Option (D) is the true statement.

### General Science

46. (D) The winged seed of drum stick get dispersed by the wind.

47. (D) Parrot-lungs, Fish-gills, Earthworm-skin. Cockroach breathe through tiny holes called spiracles. It does not use gills.

48. (B) A ribcage is formed by the fusion of curved bones. It protects the heart and the lungs.

49. (C) Fishing rod belong to III class lever. F–E–L. It is class III lever.

50. (A) Carbon dioxide is released when oxygen gas is used up in the burning of things and during respiration.

51. (B) The cup of icecream that is taken out from the refrigerator is in solid state when it is left on the table for few hours get melted and changed to liquid state. When the liquid form of icecream when again put back to the refrigerator change to solid.

solid  $\rightarrow$  liquid  $\rightarrow$  solid

52. (B) A pulley makes a flag easier to raise on a flagpole.

53. (C) Cactus and camel have special adaptations to live in deserts.

54. (B) The moon is the natural satellite of the earth.
55. (B) A rabbit is a consumer and the carrot is a part of carrot plant that is a producer.
56. (C) In a germinating seed shoot that develops or forms into stem and leaves grows up and the early roots called radicle grows down.
57. (A) In the water cycle water vapour get cooled and turn into a liquid.
58. (B) An x-ray gives the fracture details to the doctor.
59. (B) Light-weight, small and dry seeds are dispersed by wind.
60. (B) Elbow and knee joints are called hinge joints and the joints at shoulder and pelvis are called ball and socket joints.
61. (A) Diseases that can spread from one person to another are called infectious or communicable diseases.
62. (D) Carelessness is the major cause of most accidents.
63. (B) In the given lfigure X is liquid Y is solid and Z is gas.
64. (B) Insects have jointed appendages and has no bones.
65. (A) Brinjal plant is a herb with taproot and wheat is herb with fibrous root system.
66. (B) Tadpole breathe through gills. A tapole is a fish like and breathe through gills.
67. (D) Beans grows well during winter. Winter crops are called rabi crops.
68. (C) The given animal tern migrates to warmer places.
69. (A) Lava cools to form igneous rocks.
70. (A) The chemical formula of water is  $H_2O$ .
71. (A) White blood cells helps us to fight against disease causing germs like viruses and bacteria.
72. (C) A football, that rolls for some distance and then stop on its own is due to frictional force. Frictional force opposes the movement of ball.
73. (C) Miles, metres and light years are used to measure distances.
74. (C) Gram is a unit of mass in the metric system.
75. (A) If fulcrum lies between load and effort it is I order lever.  
If load lies between fulcrum and effort it is II order lever.  
If effort lies between load and fulcum it is III order lever.
76. (C) Earthworm and frog breathe through moist skin.
77. (A) Ball and socket joint enables us to swing our arms.
78. (A) Part A in the given figure represents nitrogen. About 78% of nitrogen is present in the air.
79. (C) There are 3 types of levers.
80. (D) A freely falling body when thrown up into the air come back to the earth is due to gravitational force.
81. (B) Fossils are found in sedimentary rocks.
82. (B) Heat, light and electricity are all forms of energy.
83. (A) A mango tree is a producer.
84. (D) The earth is the third blightest
85. (B) In the given figure the parts labelled in flower (1) as ovary (2) as petal (3) as stamen and (4) as sepal.
86. (A) A bat and a bird are flying animals and so the bird has wings and the bat also has modified wings.
87. (C) A hard shell protects tortoise from its predators.
88. (B) Citrus fruits like orange and lemon are rich in vitamin 'C'.
89. (B) The moon reflects the light of the sun at night.
90. (C) A ramp is an inclined plane.

