



NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION (UPDATED)

CLASS - 6
Question Paper Code : UN499

KEY

1. B	2. B	3. B	4. C	5. C	6. A	7. D	8. D	9. D	10. D
11. B	12. B	13. B	14. C	15. C	16. A	17. D	18. B	19. C	20. B
21. B	22. B	23. B	24. C	25. D	26. D	27. B	28. C	29. D	30. B
31. C	32. A	33. A	34. C	35. D	36. C	37. C	38. C	39. B	40. C
41. A	42. C	43. A	44. C	45. D	46. D	47. A	48. D	49. A	50. B
51. D	52. B	53. C	54. C	55. D	56. D	57. Del	58. B	59. B	60. C

SOLUTIONS

MATHEMATICS

1. (B) 2,3,4 & 5 LCM is 60.
 $2 + 3 = 5$
 $\therefore 2 + 3 + 4 + 5 = 14$
02. (B) Given $x : y = 5 : 6 = 5a : 6a$
 $\therefore x = 5a$ and $y = 6a$
 $(3x^2 - 2y^2) : (y^2 - x^2) = (75a^2 - 72a^2) : (36a^2 - 25a^2)$
 $= 3a^2 : 11a^2$
 $= 3:11$

03. (B) $1.385 = \frac{1385}{1000}$

$1\frac{385}{1000} = 1\frac{77}{200}$

04. (C) $LHS = \frac{6 + 12 + 18 + \dots + 60}{24 + 48 + 72 + \dots + 240}$

$= \frac{6(1+2+3+\dots+10)}{24(1+2+3+\dots+10)}$

$= \frac{6}{24} = \frac{1}{4}$

05. (C) Area of rectangle

$$= lb = 47\frac{2}{3} \text{ cm} \times 11\frac{2}{11} \text{ cm}$$

$$= \frac{143}{3} \times \frac{123}{11} \text{ cm}^2$$

$$= 533 \text{ cm}^2$$
06. (A)
$$\frac{2023^2 - 2 \times 2023 \times 23 + 23^2}{2023 - 23}$$

$$= \frac{40,92,529 - 93058 \times 529}{2000}$$

$$= \frac{\cancel{40,000,000}^{2000}}{\cancel{2000}_1}$$

$$= 2000$$
07. (D) M is prime & M + 1 is also prime
 $\Rightarrow M = 2$
 $\therefore M(M-1) + 2 = 2(2-1) + 2$
 $= 2 + 2 = 4$
 Which is least composite number
08. (D) $1 + 2 + 3 + 4 - 5 - 6 - 7 - 8 = 10 - 26 = -16$
 $9 + 10 + 11 + 12 - 13 - 14 - 15 - 16$
 $= 42 - 58 = -16$
 Number of sets of 8 numbers up to 2016
 $= \frac{2016}{8} = 252$
 \therefore Sum of this 252 sets = $(252) \times (-16)$
 $= -4032$
 Required result = $-4032 + 2017 + 2108$
 $+ 2019 + 2020 - 2021 - 2022 - 2023$
 $= -4032 + 8074 - 6066$
 $= -2024$
09. (D) Let the distance covered by dog and hare for each leap be x & y
 Given $2x = 5y$

$$x = \frac{5y}{2}$$

 Speed ratio = $6x : 4y$

$$= 6 \times \frac{5y}{2} : 4y = 15 : 4$$
10. (D) There are $99 - 9 = 90$ digit numbers.
 Among 11, 22, 33, 44, 55, 66, 77, 88 and 99 are the two digit numbers which are having same digits.
 \therefore Number of two digit numbers with different digits = $90 - 9 = 81$
11. (B) Required value = $1000^2 + 345^2 + 655^2 - 2 \times 1000 \times 345 + 2 \times 345 \times 655 - 2 \times 1000 \times 655$
 $= 1000000 + 119025 + 429025 - 690000 + 451950 - 1310000$
 $= 0$
12. (B) Area of the shaded region

$$= \frac{\text{Total area}}{2} = 50 \text{ cm}^2$$
13. (B)
$$\frac{5x}{6} = \frac{25}{3} \times \frac{1}{2}$$

 $5x = 25$
 $x = 5$
14. (C) Charge for first km = ₹ 25
 Charge of each next km = ₹ 18
 \therefore Total charge of a trip of 10 km
 $= ₹ 25 + ₹ 18 \times 9$
 $= ₹ 25 + ₹ 162$
 $= ₹ 187$
15. (C) The required number is divisible by 25 and 9
 \therefore 8760375 is divisible by 9 & 25
 $\therefore p = 0$ & $q = 5$
16. (A) $5(4 + 3) - 3(3 + 2) = 35 - 15 = 20$
17. (D)
$$\frac{5555}{6666} = \frac{5}{6} = 0.8\bar{3}$$

$$\frac{666}{777} = \frac{6}{7} = 0.8571\dots$$

$$\frac{77}{88} = \frac{7}{8} = 0.875$$

$$\frac{8}{9} = 0.8888$$

 $\therefore \frac{8}{9}$ has greatest value

18. (B) $\frac{x^y + z}{z} = \frac{4^2 + 2}{2} = \frac{18}{2} = 9$

19. (C) $7 \times 5 \times 3 \times 1 \times 7 \times 3 \times 9$ units digit is 5

20. (B) LCM of 8 & 9 is 72

72	99999	1388
	72	
	279	
	216	
	639	
	576	
	639	
	576	
	63	

∴ Required number
= 99999 – 63 + 5 = 99941

21. (B) Total no. of letters collected in the whole week = 33

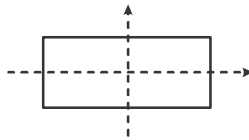
Given each = 10 letters

∴ Total no. of letters = 33 × 10
= 330 letters

22. (B) Given r = 14 cm

∴ Diameter = 2r = 2 × 14 cm = 28 cm

23. (B) A rectangle has two lines of symmetry.



24. (C) Let x = 19, then LHS of Option A

$$= \frac{21}{3} - \frac{18}{5} = \frac{35 - 18}{5} = \frac{17}{5}$$

$$\text{RHS of Option A} = \frac{22}{4} - 1 = \frac{11}{2} - 1 = \frac{9}{2}$$

Let x = 19 the LHS of Option B

$$= \frac{21}{3} - \frac{20}{5} = 3$$

$$\text{RHS of Option B} = \frac{22}{4} + 1 = \frac{13}{2}$$

LHS of Option B ≠ RHS of Option B

Let x = 19, the LHS of Option C = 3

$$\text{RHS of Option C} = \frac{19 - 3}{4} - 1 = \frac{16}{4} - 1 = 3$$

∴ LHS of Option C = RHS of Option C

25. (D) 320 is divisible by 8
∴ 2345678987654320 is divisible by 8
∴ 2345678987654325
= 2345678987654320 + 5
∴ Remainder = 5

PHYSICS

26. (D) From the experiment, we conclude that Object R does not conduct electricity but Object S conducts electricity. Bulb in circuit with object S lights up as object S is a good conductor of electricity.

27. (B) $\frac{5 \text{ cm}}{25 \text{ divisions}} = 0.2 \text{ cm} = 2 \text{ mm}$

So, the minimum value of length that can be measured using this scale is 2 mm.

28. (C) Metal spoon is a non-luminous body and torch light is a luminous body.

29. (D) In order to connect X and Y, the switch arm needs to be moved from Z to position X. As a result, electricity will be able to flow through the circuit to light up the bulb.

30. (B) 1 m = 1000 mm

So, 125 mm = (125 / 1000) m = 0.125 m

31. (C) Figure in option (C) shows the correct reflection of boy's image in a plane mirror.

32. (A) Bulb 1 in electric circuit shown in option (A) does not light up as both the wires are connected to the metal casing of the bulb.

33. (A) Motion is a relative term. Position of trees with respect to a moving train is changing

34. (C) Images are not similar to shadows.

35. (D) A pencil lead is made up of graphite which is a good conductor of electricity.

A piece of pencil lead with two ends sharpened and when placed between X and Y in the electric circuit enables a bulb to glow.

CHEMISTRY

36. (C) Card board and chopsticks are made from bamboo while measuring cylinder and camera lens are made from glass.
37. (C) Iron, paper and rubber do not break into pieces when dropped.
Rubber can be stretched to a certain extent without breaking. Paper cannot be stretched.
Glass and ceramic break into pieces when dropped. Ceramics are made from clay. The main component of glass is sand.
38. (C) Milk and water mixture form a homogeneous solution. They cannot be separated by filtration.
39. (B) To make a cooking pan, we need a material which is light, strong and a good conductor of heat.
40. (C) Sieving the residue is unnecessary as the residue obtained after filtration would only contain sand and it need not be separated further.
41. (A) In wheat flour, flour is the wanted component while husk (X) is the unwanted component. When cut paddy (Y) stalks are beaten on a stone, the grain seeds separate from their stalks.
42. (C) A toy boat must be able to float in water, strong and not easily broken.
43. (A) Kerosene and water are immiscible liquids.
44. (C) Decantation can be used to separate two immiscible liquids like oil and water. When this two liquids are allowed to stand in a container for sometime, they form two separate layers. Oil being lighter floats above heavier water. The top layer of oil can be poured into another container.
45. (D) An object (ball) sinks in oil as its density is more than the density of oil. Otherwise, the object will float.

BIOLOGY

46. (D) The substances P, Q and R in the preparation of ghee from cow are: P is Milk, Q is Cream and R is Butter.
47. (A) In taproot, growth will change the shape and function of the storage of food resource and it can be cultivated as a vegetable.
48. (D) Trees found on the hilly areas are normally cone shaped and have sloping branches.
The leaves of some of these trees are needle-like.
This helps the rainwater and snow to slide off easily.
49. (A) An earthworm moves with the help of repeated expansions and contractions of its muscles.
50. (B) Turmeric is a stem as it has nodes and internodes.
51. (D) Pivot joint allows rotatory movement on a single axis.
52. (B) Standing in the Sun in the morning helps our body to produce vitamin D.
53. (C) Arun in order to build his muscles, must eat more protein rich food.
54. (C) A tendon is a fibrous connective tissue which attaches muscle to bone. A tendon serves to move the bone or structure.
55. (D) All non-living things such as soil, water, sunlight, temperature etc. are abiotic component of an habitat. Tulsi, snail and bacteria are living components of an habitat.

CRITICAL THINKING

56. (D) None of these
(B, A, F, E, C, H, G, D)
57. (Delete)
58. (B) Total weight = $16 \times 100 \text{ g} = 1600 \text{ g}$
 $1600 + \text{weight of two extra oranges}$
 $= 104 \text{ g}$
Weight of two extra oranges
 $= 104 \text{ g} \times 18 - 1600 \text{ g} = 272 \text{ g}$
59. (B) Either 1 or 2 follows
60. (C) In this example, the slope of the inclined plane is maximum in C. Therefore, it would require more force. The right answer is C. Darken the circle of option C in the answer sheet as shown below.