



NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION (UPDATED)

CLASS - 6
Question Paper Code : UN489

KEY

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

SOLUTIONS

MATHEMATICS

01. (B) $53(87 + 3 \times 21 + 2 \times 25 - 4 \times 66)$
 $= 53(87 + 63 + 50 - 264)$
 $= 53(-64)$
 $= -3392$

02. (B) Given $\frac{x}{y} = \frac{5}{6} \Rightarrow x = \frac{5y}{6}$
 $\therefore (3x + 4y) : (5x - 2y)$
 $= \left(3 \times \frac{5y}{6} + 4y \right) : \left(5 \times \frac{5y}{6} - 2y \right)$
 $= \left(\frac{5y + 8y}{2} \right) : \left(\frac{25y - 12y}{6} \right)$

$$= \frac{13y}{2} : \frac{13y}{6}$$

$$= \frac{1}{2} \times 6 : \frac{1}{6} \times 6 = 3 : 1$$

03. (B)

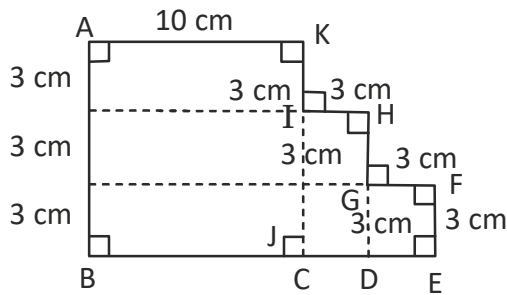
$$\begin{array}{r} 120 \overline{) 144} 1 \\ \underline{120} \\ 24 \\ 24 \overline{) 120} 5 \\ \underline{120} \\ 0 \end{array}$$

$$\begin{array}{r} 24 \overline{) 216} 9 \\ \underline{216} \\ 0 \end{array}$$

\therefore HCF of 120, 144 & 216 = 24

04. (C) Required two numbers are -6 & 4
 $[\therefore -6 \times 4 = -24 \text{ \& } -6 + 4 = -2]$

05. (D)



Area of the rectangle ABCK
 $= 10 \text{ cm} \times 9 \text{ cm} = 90 \text{ cm}^2$
 Area of the rectangle CDHI
 $= 6 \text{ cm} \times 3 \text{ cm} = 18 \text{ cm}^2$
 Area of the square DEFG
 $= 3 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$
 $= \text{Total area}$
 $= 90 \text{ cm}^2 + 18 \text{ cm}^2 + 9 \text{ cm}^2 = 117 \text{ cm}^2$

06. (B) LCM of 306 & 657

$$\begin{array}{r} 3 \mid 306, 657 \\ 3 \mid 102, 219 \\ \hline 34, 73 \end{array}$$

\therefore LCM of 306 & 657
 $= 3 \times 3 \times 34 \times 73 = 22,338$

07. (C) Given $2A = 3B = 4C = K$

$$\therefore 2A = K \Rightarrow A = \frac{K}{2}$$

$$\text{similarly } B = \frac{K}{3}$$

$$C = \frac{K}{4}$$

$$\therefore A : B : C = \frac{K}{2} : \frac{K}{3} : \frac{K}{4} = \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$$

$$= \frac{1}{2} \times 12 : \frac{1}{3} \times 12 : \frac{1}{4} \times 12$$

$[\therefore 2, 3 \text{ \& } 4 \text{ cm} = 12]$

$$= 6 : 4 : 3$$

08. (D) $861 - \frac{39483}{123} - 123 \times 333 + 141 \times 41$
 $= 861 - 321 - 40959 + 5781$
 $= -34638$

09. (C) LHS =

$$\frac{3.375 + 103.823 + 54.872 - 80.37}{2.25 + 22.09 + 14.44 - 7.05 - 17.86 - 5.7}$$

$$= \frac{81.7}{8.17} \times \frac{10}{10} = \frac{81.7 \times 10}{81.7} = 10$$

10. (D) LCM of 48, 24, 32, 16 & 12 = 96

$$\therefore \frac{-19}{48} = \frac{-15}{48} \times \frac{2}{2} = \frac{-38}{96}$$

$$\frac{-13}{24} = \frac{-13}{24} \times \frac{4}{4} = \frac{-52}{96}$$

$$\frac{-13}{32} = \frac{-17}{32} \times \frac{2}{2} = \frac{-53}{96}$$

$$\frac{-9}{16} = \frac{-9}{16} \times \frac{6}{6} = \frac{-54}{96}$$

$$\frac{-7}{12} = \frac{-7}{12} \times \frac{8}{8} = \frac{-56}{96}$$

$$\frac{-38}{96} > \frac{51}{96} > \frac{-52}{96} > \frac{-54}{96}$$

$$> -\frac{56}{96}$$

i.e. $\frac{-19}{48} > \frac{-17}{32} > \frac{-13}{24} > \frac{-9}{16} > \frac{-7}{12}$

11. (D) Given $\frac{22}{7} : \frac{11}{3} = x : \frac{7}{2}$

Product of means = Product of extremes

$$\therefore \frac{x}{3} = \frac{7}{2} \times \frac{2}{7}$$

$$\therefore x = 3$$

12. (D) One unit squares = 16

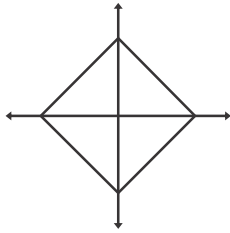
Two unit squares = 9

Three units squares = 4

Four units square = 1

$$\therefore \text{Total squares} = 16 + 9 + 4 + 1 = 30$$

13. (A) A rhombus has 2 lines of symmetry



14. (B) Number of cars sold in week 1
 $= 3 \times 2 = 6$
 (Each symbol represents 2 cars)
 4 more cars were sold in week 3 than in week 1
 \Rightarrow Number of cars were sold in week 3
 $= 6 + 4 = 10$ which is represented by $\frac{10}{2}$
 $= 5$ symbols

15. (A) Required number = (Greatest four digit number which is divisible by the LCM of 3, 5, 7, 9) – 2
 $9765 - 2 = 9763$
 (or)
 From option only 9763 satisfies the given conditions

16. (B) Total watches brought = $\frac{\text{₹}39,975}{\text{₹}195} = 205$
 Total watches sold = $\frac{\text{₹}43,680}{\text{₹}240} = 182$
 \therefore Number of watches thrown away
 $= 205 - 182 = 23$

17. (B)
$$\begin{aligned} \text{LHS} &= 1 - \left(\frac{1}{2} + \frac{1}{3}\right) + \left(\frac{1}{3} + \frac{1}{4}\right) - \left(\frac{1}{4} + \frac{1}{5}\right) \\ &+ \left(\frac{1}{5} + \frac{1}{6}\right) - \left(\frac{1}{6} + \frac{1}{7}\right) + \left(\frac{1}{7} + \frac{1}{8}\right) - \left(\frac{1}{8} + \frac{1}{9}\right) \\ &= 1 - \frac{1}{2} - \frac{1}{3} + \frac{1}{3} + \frac{1}{4} - \frac{1}{4} - \frac{1}{5} + \frac{1}{5} + \frac{1}{6} \\ &- \frac{1}{6} - \frac{1}{7} + \frac{1}{7} + \frac{1}{8} - \frac{1}{8} - \frac{1}{9} \\ &= \frac{1}{2} - \frac{1}{9} = \frac{9-2}{18} = \frac{7}{18} \end{aligned}$$

18. (A) Let $x = 14$, then LHS of option A

$$= \frac{3 \times 14}{4} - \frac{13}{2} = \frac{21-13}{2} = \frac{8}{2} = 4$$

Let $x = 14$, the RHS of option A

$$= \frac{14-2}{3} = \frac{12}{3} = 4$$

\therefore LHS of option A = RHS of option A

19. (D) Greatest 6 digit number = 9,99,999

Greatest 5 digit number = 99,999

\therefore Number of 6 digit numbers
 $= 9,99,999 - 99,999 = 9,00,000$

20. (D) Sum of the digits

$$\begin{aligned} &= 7 + 6 + 5 + 4 + 3 + 2 + 1 + 0 + 1 + 2 + 3 \\ &+ 4 + 5 + 6 + 7 + 8 \\ &= 64 \end{aligned}$$

If sum is 63 then the given number is divisible by 9

\therefore Remainder = $64 - 63 = 1$

21. (A) MCDXLIX

$$\begin{aligned} &= 1000 + (500 + 100) + (50 - 10) + (10 - 1) \\ &= 1449 \end{aligned}$$

22. (C) $y + y = 180^\circ$ [\therefore straight angle]

$$2y = 180^\circ$$

$$y = \frac{180^\circ}{2} = 90^\circ$$

23. (C) Required sum

$$\begin{aligned} &= \left(\frac{11xy}{2} - \frac{13xy}{7} - \frac{15xy}{8}\right) \\ &+ \left(\frac{13x}{7} - \frac{12x}{5} + \frac{7x}{9}\right) + \left(\frac{12y}{5} - \frac{11y}{2} - \frac{11y}{13}\right) \\ &= \left(\frac{308xy - 104xy - 105xy}{56}\right) \\ &+ \left(\frac{585x - 756x + 245x}{315}\right) \\ &+ \left(\frac{312y - 715y - 110y}{130}\right) \\ &= \left(\frac{99xy}{56} + \frac{74x}{315} - \frac{513y}{130}\right) \end{aligned}$$

24. (C) Given the ratio of ₹ 50, ₹ 20 & ₹ 10

$$= 4 : 5 : 8 = 4x : 5x : 8x$$

∴ Total amount

$$= 4x \times ₹ 50 + 5x \times ₹ 20 + 8x \times ₹ 10$$

$$= ₹(200x + 100x + 80x)$$

$$= ₹380x$$

But given total amount = ₹ 2660

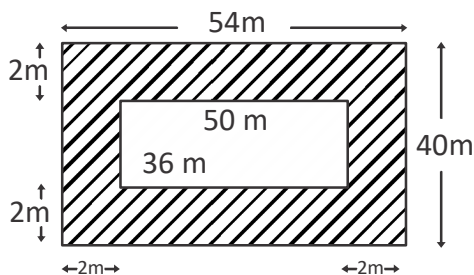
$$\Rightarrow ₹ 380x = ₹ 2660$$

$$x = \frac{₹2660}{₹380} = 7$$

∴ Number of ₹ 50 notes

$$= 4x = 4 \times 7 = 28$$

25. (B)



Length of the outer rectangle

$$= 50\text{m} + 2\text{m} + 2\text{m} = 54\text{m}$$

Breadth of the outer rectangle

$$= 36\text{m} + 2\text{m} + 2\text{m} = 40\text{m}$$

$$\text{Total area } lb = 54\text{m} \times 40\text{m} = 2160 \text{ m}^2$$

$$\text{Lawn area} = lb = 50\text{m} \times 36\text{m} = 1800 \text{ m}^2$$

Area of the path

$$= \text{Total area} - \text{Lawn area} = 360 \text{ m}^2$$

PHYSICS

26. (D) From the given graph, we can conclude that at point P, the amount of current flowing through the circuit became zero. Thus, the circuit became an open circuit. This could have happened either due to the switch being turned off or the battery being removed.

27. (C) Statements (i) and (iii) are correct about the scale used for measurement.

The numbers on the scale cannot be adjusted according to the length of the object is not a correct statement.

28. (C) Light from the other side of the wall is reflected by the two plane mirror strips and reaches his eyes to see things on the other side of the wall.

29. (B) Bulbs M and N are adjacent to one another so, the current is shared between both the bulbs. Most of the current passes through bulb L. Thus, bulb L glows brighter than Bulb M and Bulb N.

Option (A): The current flowing through the three bulbs are different. Hence, they cannot be of the same brightness.

Option (C) and (D): Bulbs M and N are of equal brightness but both are less brighter than L.

30. (B) X is length and Y is an activity used to measure time.

31. (C) A torch light focussed on the ball will form a shadow on the whiteboard if light is blocked by it but travels through sheets X and Y. Thus, both the sheets allow light to pass through them. As sheets X and Y are transparent and both of them allow light to pass through them, the shadow of a ball being opaque is formed on the whiteboard.

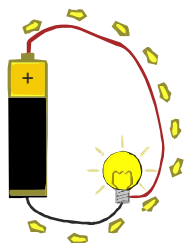
32. (B) The reason for filling the space between the terminals of the bulb with sealing wax is to prevent the contact between the two terminals.

33. (C) Total distance travelled = $1.25 + 4 + 4 + 4 + 1.25 + 1.25 + 1.25 = 17 \text{ m}$

34. (B) Spectacle glass and clear plastic allow light to pass through them as they are transparent. Light does not pass through wood, steel, rubber and ceramic.

35. (B) When the switch of an electric circuit is closed, the current will flow from positive terminal to the negative terminal of a cell as shown below:

Closed circuit



CHEMISTRY

36. (D) The level in the 2nd beaker is the sum of the volumes of oil and water (as oil and water are immiscible). Water is 45 ml and oil is 30 ml = 75 ml. When water is poured into a beaker containing oil, oil being light floats above heavier water. It is correctly shown in beaker in option (D).

37. (D) The smaller iron rim first expands on heating and fits into the wooden wheel of a cart. On cooling it contracts to fit into the wooden wheel tightly and does not come out.

38. (B) The water vapour in the air will lose heat and condense into liquid water when it touches the cold outer surface of the glass containing ice cubes. The liquid water will flow downwards and gets collected in the saucer.

Water exists as water vapour (water in the gaseous state) in the air.

39. (C) Wax coated paper is translucent. It can be placed under group Q.

40. (C) Oil is less dense than water so, it floats on the top.

41. (D) Changes P are Reversible and Q are Irreversible changes.

42. (B) Both a feather and a plastic ball being lighter than water float in a tumbler half-filled with water.

43. (D) All the given activities occur due to condensation.

44. (B) When the solution of copper sulphate is evaporated in china dish, water evaporates leaving behind the solid copper sulphate crystals.

45. (C) The part labelled R is made from glass. It is a poor conductor of heat that helps to retain heat by keeping hot liquids hot and gives out heat and keeps cool liquids cool.

BIOLOGY

46. (B) Turmeric is a stem as it has nodes and internodes.

47. (B) The child is suffering from disease Kwashiorkor as its symptoms suggest. Kwashiorkor is a protein deficiency disease that occurs most commonly in children between 1 to 5 years of age.

48. (D) Eye care practices includes washing the eyes with cold water, reading and writing in proper light while keeping the book at a distance of 25 centimetres, watching a computer screen from a optimum distance of 8 to 10 feet.

49. (D) Edible part of ginger and onion is stem. Edible part of broccoli is flower.

50. (Delete)

51. (B) P: Goat; Q: Vulture; R: Hookworm; S: Rat

52. (B) Hinge joints allow movement primarily in one plane like a door moves at 180° degrees on hinge. Knee joint and elbow joint are examples of this type of joint.

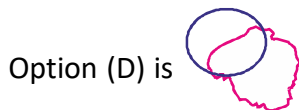
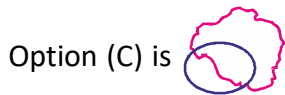
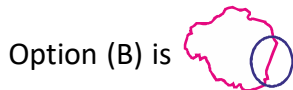
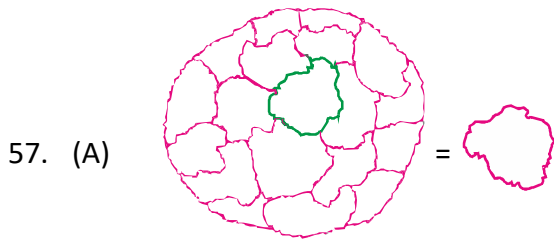
53. (B) Turnip, Carrot, Sweet potato are root parts that store food.

54. (B) Goitre is caused due to deficiency of iodine. It is advisable to take iodised salt to prevent and cure goitre.

55. (B) In the given options, herbivorous animals are deer, rabbit, cow, buffalo, camel and goat.

CRITICAL THINKING

56. (B) Man B is moving the ball with some object which makes less effort than moving ball with hands. So, B is the right answer.



58. (D) Budget plan → Government Funding → Investment plane → Shop purchase → Inauguration → Selling

Option (D) makes the sequence meaningful form. Hence, option (D) is correct.

59. (D) das = little

zci = good

cos = girl

zci = good

cos = girl

das = little

cos = girl

∴ mistake is coded either nug or drs

60. (C)

1	2	3	4
^		^	
2	1	4	3
			∨
4	3	1	2
	^		∨
3	4	2	1

=====*The End*=====