



NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION (UPDATED)

CLASS - 6
Question Paper Code : 1P204

KEY

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

SOLUTIONS

MATHEMATICS

01. (A) $2024\frac{1}{8} + 2024\frac{2}{8} + \dots + 2024\frac{7}{8}$

$$= 2024 + \frac{1}{8} + 2024 + \frac{2}{8} + 2024$$

$$+ \frac{1}{8} + \dots + 2024 + \frac{7}{8}$$

$$= \underbrace{2024 + 2024 + \dots + 2024}_{7 \text{ times}}$$

$$+ \frac{1}{8} + \frac{2}{8} + \frac{3}{8} + \frac{4}{8} + \frac{5}{8} + \frac{6}{8} + \frac{7}{8}$$

$$= 14168 + \frac{1+2+3+4+5+6+7}{8}$$

$$= 14168 + 3\frac{1}{2} = 14171\frac{1}{2}$$

02. (D) Option 'A' last two digits are divisible by 4.
But sum of the digits = 1 + 4 + 8 + 1 + 6 + 0 = 20
Which is not divisible by 3.
∴ 148, 160 is not divisible by 12.
Option 'D' last two digits are divisible by 4
Sum of the digits of option D = 1 + 4 + 8 + 2 + 2 + 4 = 21

Which is divisible by 3.

∴ Option 'D' divisible by both 3 & 4 =
Option 'D' is divisible by 12

03. (C) 6307 is not divisible by 43

6307 is not divisible by 47

6307 is divisible by 53

7473 is divisible by 53

8692 is divisible by 53

∴ All numbers are divisible by 53

04. (D) Given $-50 + (-x) + 30 = 0$

Let $x = -20$, then $-50 + [-(-20)] + 30$

$= -50 + 20 + 30$

$= -50 + 50$

$= 0$

∴ $x = 20$

05. (D) Length of the rectangle = $\frac{\text{Area}}{\text{Breadth}}$

$$= \frac{1650 \text{ cm}^2}{25 \text{ cm}}$$

(l) = 66 cm

Perimeter of a rectangle = $2(l + b)$

$= 2(66 \text{ cm} + 25 \text{ cm})$

$= 2(91 \text{ cm})$

$= 182 \text{ cm}$

06. (C) Given

$$A : B = \frac{1}{2} : \frac{3}{8} = \frac{1}{\cancel{2}_1} \times \cancel{8}^4 : \frac{3}{\cancel{8}^1} \times \cancel{1}^1 = 4 : 3$$

$$B : C = \frac{1}{3} : \frac{5}{9} = \frac{1}{\cancel{3}^1} \times \cancel{9}^3 : \frac{5}{\cancel{9}^3} \times \cancel{1}^1 = 3 : 5$$

∴ $A : B : C = 4 : 3 : 5$

07. (D) $1 + \frac{2}{\left(\frac{2-1}{2}\right)} \times \frac{3}{\frac{5}{\cancel{6}/2} \text{ of } \frac{\cancel{3}}{2} \div \frac{5}{4}}$

$$= \frac{2}{1 + \frac{1}{\left(\frac{1}{2}\right)}} \times \frac{3}{\frac{\cancel{3}}{\cancel{4}} \times \frac{\cancel{4}}{\cancel{3}}}$$

$$= \frac{2}{1+2} \times 3 = 2$$

08. (D) Given $n + n + 1 = 25$

09. (A) Final marks = $4 \times 3 - 1 \times 1 = 12 - 1 = 11$

10. (B) From options $4 - \frac{5}{2} = \frac{8-5}{2} = \frac{3}{2} = 1\frac{1}{2}$

∴ $x = 4$

11. (D) $\frac{Q}{P} = \frac{1000}{0.01} = \frac{1000}{0.01} \times \frac{100}{100} = 1,00,000$

which is the largest among the given options

12. (C) Side of square = $12 \text{ cm} - 2 \text{ cm} - 4 \text{ cm}$
 $= 6 \text{ cm}$

∴ Area of square = $S^2 = (6 \text{ cm})^2 = 36 \text{ cm}^2$

Area of both rectangles = $(3 + 5) \times 4 \text{ cm}^2$
 $+ 7 \times 2 \text{ cm}^2$

$= 32 \text{ cm}^2 + 14 \text{ cm}^2$

$= 46 \text{ cm}^2$

Difference of area = $46 \text{ cm}^2 - 36 \text{ cm}^2$

$= 10 \text{ cm}^2$

13. (C) LCM of 6, 8 & 10 = 120

∴ After 120 minutes ie 2 hours all the three bells toll together

14. (B) 1023, 1032, 1203, 1230, 1302, 1320

2013, 2031, 2103, 2130, 2310, 2301

3012, 3021, 3201, 3210, 3102, 3120

There are 18 numbers which are 4 digits numbers

15. (B) Required number = LCM of (12, 16, 18, 21 & 28) + 17

$= 1008 + 17$

$= 1025$

16. (D) Remaining rope length

$$= \left(36\frac{1}{3} - 12\frac{2}{5} - 13\frac{1}{2} - 5\frac{1}{6} \right) \text{m}$$

$$= \left(\frac{109}{3} - \frac{62}{5} - \frac{27}{2} - \frac{31}{6} \right) \text{m}$$

$$= \left(\frac{1090 - 372 - 405 - 155}{30} \right) \text{m} = \frac{158}{30} \text{m}$$

$$= \frac{79}{15} \text{m} = 5\frac{4}{15} \text{m}$$

17. (A) Savings in March

$$\begin{aligned} &= \frac{\text{₹}7200 - \text{₹}1600 - \text{₹}800}{2} \\ &= \frac{\text{₹}4800}{2} = \text{₹} 2400 \end{aligned}$$

18. (A) Value of $x = -12$

$$\therefore x - y = -12 - 20 = -32$$

19. (C) Cost of first km = Rs. 25

cost for the next 12 km = $12 \times \text{Rs. } 18 = \text{Rs. } 216$

Total amount paid for 13 km = Rs. 25 + Rs. 216

$$= \text{Rs. } 241$$

20. (A) Sum of digits of 345670 = $3 + 4 + 5 + 6 + 7 + 0 = 25$

'2' to be added to 345670 to divided by 3

\therefore 345672 is divisible by 3 & an even number

\therefore 345672 is divisible by 6

21. (A) $5(a + b) - 9(b + c) = 5(2 \times 3) - 9(3 + 4)$

$$= 5 \times 5 - 9 \times 7$$

$$= 25 - 63$$

$$= -38$$

22. (B) $\frac{1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9}{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9}$

$$= \frac{1 \times 2 \times 3 \times 4 \times \cancel{5} \times 6 \times 7 \times 8 \times \cancel{9}}{45}$$

$$= 8064$$

23. (C) Distance travelled by train

$$= 63.257 \text{ km} - 48.56 \text{ km}$$

$$= 14.697 \text{ km}$$

24. (B) LHS = $7654321(147 + 249 + 251 + 253)$

$$= 7654321 \times 900$$

$$= 6888888900$$

25. (B) Given cost of two tapes = ₹ 40

$$\therefore \text{Cost of one tape} = \frac{\text{₹}40}{2} = \text{₹} 20$$

$$\therefore \text{Cost of pin} = \text{₹} 31 - \text{₹} 20 = \text{₹} 11$$

$$\therefore \text{Cost of clip} = \text{₹} 81 - \text{₹} 11 = \text{₹} 70$$

PHYSICS

26. (C) When only switch S_1 is closed and S_2 is open, current flows through bulbs P and Q. So, only bulbs P and Q will glow.

27. (C) Objects grouped under group X are luminous as they emit light.

Objects grouped under group Y are non-luminous as they do not emit light. When light falls on these objects they are visible or seen by us due to reflection of light.

Mirror is a non-luminous object and a sparkler is a luminous object.

28. (B) Let 'h' be the height of Harsha.

The height of Ravi = $(h + 50)$ cm

Height of Ravi + height of Harsha

$$= 2.8 \text{ m} = 280 \text{ cm}$$

$$\therefore (h + 50) + h = 280 \text{ cm}$$

$$\Rightarrow 2h + 50 = 280$$

$$\Rightarrow 2h = 280 - 50 = 230$$

$$\Rightarrow 2h = 230$$

$$\Rightarrow h = 115 \text{ cm}$$

The height of Harsha = 115 cm

The height of Ravi = $115 + 50 = 165$ cm

29. (B) In the electric circuit shown in option (B), the bulb glows only when switch is in 'ON' position with bulb connected to an electric cell.

Hence, the bulb in this circuit will glow.

30. (A) Rani can see her full image including her feet in a plane mirror due to reflection of light. Light rays from her feet incident on the mirror get reflected which enables her to see her feet in the plane mirror.

31. (B) $1 \text{ m} = 100 \text{ cm}$ or $1 \text{ cm} = 10^{-2} \text{ m}$

Therefore, the length of Avinash's car

$$= 500 \times 10^{-2} \text{ m}$$

$$\text{or } 500 \div 100 = 5 \text{ metre}$$

32. (C) Our body is a good conductor of electricity.

33. (B) Shadows 1 and 4 are cast in the correct direction in the morning sun.

34. (C) 1 m = 1000 mm
 $\frac{1}{10}$ m = 100 mm
35. (B) When one bulb is connected to five electric cells in an electric circuit, the bulb lights up for an instant and stops glowing as too much electricity passed through the filament of the bulb.

CHEMISTRY

36. (D) Green plants take in carbon dioxide to carry out photosynthesis and release oxygen.
37. (D) It is a mixture of chalk powder, sugar and water. The chalk powder gets separated from sugar water by filtration. Later, sugar from sugar water is separated by distillation.
38. (D) Paper and cloth are not water proof. When these materials are placed in water, they absorb water and become completely wet after day.
39. (A) The given properties belong to oxygen.
40. (C) The given figure shows two different particles and is therefore a mixture and not a pure substance.
 Option (A) : The diagram shows one type of particle, so it is a pure substance.
 Option (B) : The diagram shows one type of molecule (made up of two atoms), so it is a pure substance.
 Option (D) : The diagram shows one type of molecule (made up of atoms), so it is a pure substance.
41. (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.
42. (D) Air helps in the movement of sailing yachts, gliders, parachutes and aeroplanes etc.
43. (C) Milk and water mixture form a homogeneous solution. They cannot be separated by filtration.

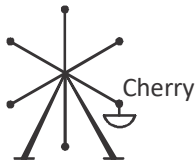
44. (D) Chalk in the form of a rod is not a waterproof material as it turned green when placed in a beaker containing green solution. Rubber rod is a waterproof material as there was no change in colour on its surface.
45. (D) All the given statements are true about air.

BIOLOGY

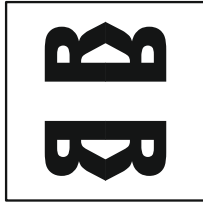
46. (C) The given description refers to the skeletal system.
47. (A) Carbohydrates provide energy.
48. (B) 'X' in the given figure is a xerophyte.
49. (D) Living things are classified on the basis of nutrition. Plants make their own food they are called producers, organisms that depends on others for their food are called consumers and the organisms that feed on dead and decaying organic matter are decomposers.
50. (C) Fibres in food help in peristaltic movements. It also helps to defaecate undigested food.
51. (B) In the given figure I - skull, II - ribcage, III - back bone, IV - thigh bone.
52. (A) Balanced diet provides all the nutrients in adequate amount that our body needs along with roughage and water. A meal containing chapati, dal, green leafy vegetables and butter can be considered as a balanced diet as it will provide carbohydrates from chapati, proteins and water from dal, vitamins and minerals from green leafy vegetables, roughage from chapati and green leafy vegetables and fats from butter.
53. (B) Some non-woody plants have structures like tendrils, twining stems, hooks or clasping roots to cling onto supports so that the plants can grow to higher grounds and obtain more sunlight.
54. (D) Plant are called producers as they produce their own food.
55. (C) Juices are made from fruits of plants.

CRITICAL THINKING

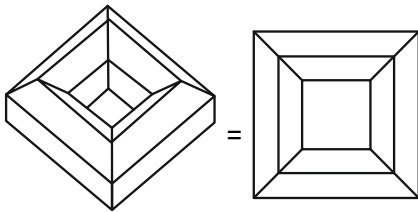
56. (A)



57. (C)



58. (B)



59. (C)

“Your mother’s unmarried sister”:

Manikumari’s mother’s unmarried sister is Manikumari’s maternal aunt (who is not married).

“Your mother’s unmarried sister’s only brother-in-law”:

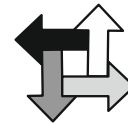
The brother-in-law of Manikumari’s mother’s unmarried sister would be Manikumari’s father because her father is the husband of Manikumari’s mother.

“Your mother’s unmarried sister’s only brother-in-law’s son”:

The son of Manikumari’s father would be Manikumari’s brother because Manikumari’s father’s son is her sibling.

Conclusion : The person standing there is Manikumari’s brother.

60. (D)



The End
