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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

CLASS - 6

Question Paper Code : 1O119

KEY

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

SOLUTIONS

MATHEMATICS

01. (B) Co-prime of 35 is 44

02. (D) The cost of (3 + 5 + 4) pens + (4 + 3 + 5) pencils + (5 + 4 + 3) erasers

= ₹37 + ₹37 + ₹46

$\therefore$ The cost of 12 pens + 12 pencils + 12 erasers = ₹120

$\therefore$ cost of one pen + one pencil + one eraser = RS $= \frac{120}{12}$ = ₹10

03. (C)

$$\begin{array}{r} 4059\overline{)4182}\,(1 \\ 4059 \\ \hline 123\overline{)4059}\,(33 \\ 4059 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 123\overline{)4223}\,(34 \\ 4182 \\ \hline 41\overline{)123}\,(3 \\ 123 \\ \hline 0 \end{array}$$

04. (A) Number of pieces $= \dfrac{30\text{ cm} \times 40\text{ cm}}{5\text{ cm} \times 5\text{ cm}}$

$= 48$

05. (D) $\dfrac{2\times3\times5\times7\times11\times13}{1+2+3+4+5+6+7+8+9+10}$

$= \dfrac{2\times3\times\cancel{5}\times7\times\cancel{11}\times13}{\cancel{55}^{\,\cancel{5}}} = 546$

06. (D) $LHS = 99+\frac{1}{7}+99+\frac{2}{7}+99+\frac{3}{7}$

$+99+\frac{4}{7}+99+\frac{5}{7}+99+\frac{6}{7}$

$= 99\times6+\left(\frac{1}{7}+\frac{2}{7}+\frac{3}{7}+\frac{4}{7}+\frac{5}{7}+\frac{6}{7}\right)$

$= 594 + 3 = 597$

07. (D) $\angle COD = 180° - 110° = 70°$

But $\angle COD + \angle BOC = 85°$

$70° + \angle BOC = 85°$

$\therefore \angle BOC = 15°$

08. (B) Length and breadth are required to construct a rectangle

09. (A) Area of each square $= s^2 = (4\text{ cm})^2$

$= 16\text{ cm}^2$

Area of table top $= 25 \times 16\text{cm}^2 = 400\text{cm}^2$

10. (A) LHS = 1 + 3 + 5 + ... + 13 + 15 + ... + 25 + 27

= (1 + 27) + (3 + 25) + (5 + 23) + ... + (13 + 15)

= 28 + 28 + ... + 28

← 7 times →

= 7 × 28 = 196

11. (B) Given (1 + 2 + 3 +.....+ 50) + (46 + 47 + ...+ 99) = 1275 + 3915

$\therefore$ 1 + 2 + 3 +.....+ 50 + (46 + 47 + 48 + 49 + 50) + (51 + ...+ 99) = 5190

$\therefore$ 1 + 2 + 3 + ... + 50 + 240 + 51 + 52 +.....+ 99 = 5190

$\therefore 1+2+3+.....+99 = 5190 - 240 = 4950$

12. (B) 997 is the greatest 3 digit prime number

13. (C)

$$\begin{array}{r} 247\overline{)416}(1 \\ \underline{247} \\ 169\overline{)247}(1 \\ \underline{169} \\ 78\overline{)169}(2 \\ \underline{156} \\ 13\overline{)78}(6 \\ \underline{78} \\ 0 \end{array}$$

$$\begin{array}{r} 13\overline{)663}(51 \\ \underline{65} \\ 13 \\ \underline{13} \\ 0 \end{array}$$

HCF = 13

$$\begin{array}{r|l} 13 & 247, 416, 663 \\ \hline & 19, 32, 51 \end{array}$$

$\therefore$ LCM = 13 × 19 × 32 × 51

= 4,03,104

$\therefore$ LCM + HCF = 4,03,104 + 13 = 4,03,117

14. (C) Area of $\Delta CDE = \frac{1}{2} \times CD \times AD$

$= \frac{1}{2} \times 17.8\text{ cm} \times 11.7\text{ cm}$

$= 104.13\text{ cm}^2$

$\therefore$ Area of the shaded region $= 104.13\text{ cm}^2$

(or)

Area of the rectangle – area of ΔCDE

$= 17.8 \times 11.7\text{ cm}^2 - 104.13\text{ cm}^2$

$= 208.26\text{ cm}^2 - 104.13\text{ cm}^2$

$= 104.13\text{ cm}^2$

15. (C) 92° is abtuse angle

16. (B) Area of parallelogram = 16

2[ar(triangle)] = 16

area of one triangle = 8

$\therefore$ area of trapezoid = 3[area of triangle]

= 3 × 8

= 24 sq.cm

17. (D) $(123 \times 5 \times 567 - 7 \times 123 \times 99 - \times 3 \times 321 - 179 \times 123)$

$= 123 (5 \times 567 - 7 \times 99 - 963 - 179)$

$= 123(2835 - 693 - 963 - 179)$

$= 123 \times 1000 = 1,23,000$

18. (D) 320 is divisible by 8

$\therefore$ 2345678987654320 is divisible by 8

$\therefore$ 2345678987654325

= 2345678987654320 + 5

$\therefore$ Remainder = 5

19. (D) $16 \times 9 = 144$

$16 + 9 = 25$

$\therefore$ Smaller number = 9

20. (B) 67, 61, 59, 53, 47, 43, 41

p q r s

$\therefore$ r = 41

21. (C) $98 \times 98 - 2 \times 98 \times 103 + 103 \times 103$

$= 9604 - 20188 + 10609$

$= 25$

22. (B) Prime numbers between 1 and 50 are

2,3,5,7,11,13,17,19,23,29,31,37,41,43,47

$\therefore$ m = 15

Prime numbers between 50 and 100 are 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

$\therefore$ n = 10

$\therefore$ m – n = 15 – 10 = 5

23. (B) Age of Ram = $60y - 5y = 55y$

Age of Raju = $55y - 4y$ = 51 year

Age of Babu = $51y - 6y$ = 45 years

Age difference between Mahesh & Babu = $60y - 45y = 15y$

24. (D) Given product of two numbers

= LCM × HCF

$\Rightarrow$ 264 × other number = 1320 × 12

$\therefore$ Other number = $\frac{1320 \times 12}{264} = 60$

25. (B) Dividend = Divisor × Q + R

3134688 = divisor × 9765 + 123

$\therefore$ Divisor × 9765 = 3134688 – 123

= 3134565

$\therefore$ Divisor = $\frac{3134565}{9765}$ = 321

PHYSICS

26. (C) The magnets are initially floating because adjacent poles are the same (e.g., North facing North) and are repelling each other. This repulsive force balances the weight of the magnets above it.

If one magnet's orientation is flipped, its poles will reverse. The side that was previously repelling the magnet above or below it will now attract it. Since the attractive force is now acting between the adjacent magnets, they will pull towards each other and stick together, disrupting the delicate balance of repulsive forces that kept the entire stack floating. The rest of the stack will then likely collapse or shift as the forces are no longer balanced

27. (B) Cloth tapes stretch: A cloth or fabric tape is less rigid and can stretch slightly when pulled tightly during measurement, especially over a long distance. This stretching makes the "marked" units on the tape actually cover a longer true distance than their nominal value.

Result: When Student X (using the cloth tape) measures the land, the tape extends, so the reading on the tape (e.g., 10 meters) corresponds to a slightly longer actual length than 10 meters. Therefore, for a fixed length of land, the cloth tape will indicate a seemingly larger measurement than the more accurate metal tape. The metal tape (used by Student Y) is far more stable and does not stretch appreciably under normal surveying tension.

28. (B) To make readings clearer and more sensitive

29. (D) Displacement refers to the change in the position of an object. If an object moves and ends up in a different position than where it started, there is displacement.

A rotating ceiling fan (A): While the fan blades rotate, the fan itself doesn't change position in space, so it doesn't cause displacement. The blades move in a circular motion but return to their starting point.

A spinning disc on a table (B): The disc rotates around its center, but if it's stationary on the table, the center of the disc doesn't change its position, meaning there is no displacement.

Earth's rotation (C): Earth rotates on its axis, but this involves displacement of the planet's surface. However, if you refer specifically to the idea of a point on the surface of Earth, its displacement is technically very small (when looking at small distances, like at a single point), but Earth still rotates, so this might be a more tricky example in the context of a "point" on Earth.

A lift moving upward (D): When a lift moves upward, it changes its position. This directly results in displacement since the lift is physically moving to a different location.

So, the lift moving upward is the example that fails to demonstrate motion without displacement, as it involves actual displacement.

30. (D) Magnetic field lines are not drawn using a magnet itself.

They are traced using iron filings or a small compass needle.

A disc magnet only produces the field, it does not draw or trace field lines.

31. (C) A measuring tape is designed for measuring short to moderate lengths, typically recorded in metres (m), centimetres (cm), feet, or inches.

It is not practical to measure very large distances such as kilometres (km) using a hand-held tape because:

- The tape has limited length
- Repeated placements increase error
- It is inefficient and inaccurate for long land distances

Therefore, pairing a measuring tape with kilometres (km) is inappropriate, making option C the correct answer.

32. (B) Repulsion away from the magnet

33. (C) Rack – translatory, Pinion – rotational

34. (B) Temperature recorded will be higher

35. (A) Prevents mercury from flowing back on its own

CHEMISTRY

36. (A) The process of water cycle is shown in the given figure.

37. (D) Metals are hard, lustrous and good conductors of electricity.

38. (C) Clouds are formed due to evaporation and condensation.

39. (D) All the given statements help in classifying materials into groups.

40. (B) Condensation occurs due to the change in the state of water from the gas into liquid droplets on the outer side of cool water bottle.

41. (B) Salt is soluble in water.

42. (C) Due to the sunrays, the water vapour present in the atmosphere condenses to form drops of water (dew) which fall on the blades of grass, leaves of plants etc., during early winter mornings.

43. (A) As glass allows light to pass through, we can see through it. This physical property of glass is the main reason why glass is used to make spectacle lenses, light bulbs, fish tanks and window panes.

Glass is not flexible. It cannot be bent.

It is heavy and does not float on water.

A strong object can support heavy loads without breaking.

44. (A) During summer, water is released from our body as sweat. Evaporation causes cooling because water droplets present on the skin require some heat to evaporate, which they take from the body.

45. (D) Both litre and millilitre are used to measure the volume of liquids.

BIOLOGY

46. (C) Traditional foods develop based on local agriculture, weather, and cultural practices. Ragi grows well in Karnataka's climate, while Gujarat uses its own grains and spices.

47. (B) The logical flow starts at the farm where wheat is grown. After harvesting, threshing separates the grain. The grain is ground into flour at a mill, then sold in the market. Finally, flour is bought to make chapatis.

48. (C) The quick closing action is a direct response to physical contact (touch stimulus), demonstrating that certain plants can exhibit rapid movement when stimulated.

49. (B) • Biotic components: Plants, fish, birds (living organisms)

• Abiotic components: Soil, water, rocks (non-living)

Interaction: Living organisms depend on abiotic factors for growth, shelter, and survival.

50. (C) Grass is a producer that makes its own food through photosynthesis using sunlight.

The cow, a consumer, gets energy indirectly from the Sun by eating the grass.

51. (C) Gourd, passion flower and grapevine are all climbers. In these plants, an axillary bud is modified to form tendrils.

52. (B) Acclimatisation is the small changes that takes place in the body of single organism over short period, to overcome small problems such as high temperature and light, in the environment.

53. (D) Omnivorous eat both plant and animals.

54. (D) Plants shoots consists of stem and leaves. Leaves prepare food for the plant. To prepare food it needs water, air and sunlight. Water is absorbed by the roots from the soil and shoots respond towards light.

55. (D) Adaptation is any feature of an organism that helps it survive and reproduce in its habitat.

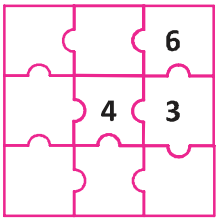
CRITICAL THINKING

56. (B) 

57. (A) Apple is neither white nor green, so apple must be in the red box.

Chocolate is in either white or red, but red already has the apple.

Therefore, the chocolate bar is in the white box.

58. (B) 

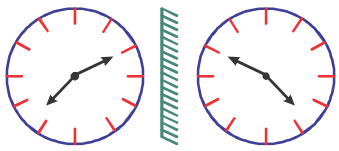
59. (A) From I : Mohan > Sohan

From II : Pooja > Mohan

So, order is Pooja > Mohan > Sohan.

Thus Sohan is slower than Pooja, so statement III is false

60. (C) The exact time of getting can be obtained by finding the mirror image of the time seen, i.e.,



So, the time when the person woke was 4 : 50 am.