



UNIFIED COUNCIL

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SLSTSE

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STATE LEVEL SCIENCE TALENT SEARCH EXAMINATION

CLASS - 7

Question Paper Code : US757

KEY

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

SOLUTIONS

MATHEMATICS

1. (D) $6a^2b = 2 \times 3 \times a \times a \times b$
 $10ab^2 = 2 \times 5 \times a \times b \times b$
 $8abc = 2 \times 2 \times 2 \times a \times b \times c$
 \therefore HCF = 2ab
2. (C) Let the number be x
Given $\frac{x}{3} + \frac{x}{2} = 20$
 $\frac{5x}{6} = 20$
 $x = 24$
3. (D) Given A : B = 3 : 4 = 5 × 3 : 5 × 4 = 15 : 20
Given A : C = 5 : 6 = 5 × 3 : 6 × 3 = 15 : 18
 \therefore A : B : C = 15 : 20 : 18

4. (D) Speed = $\frac{\text{Distance}}{\text{time}} = \frac{100 \text{ m}}{12 \text{ sec}} = \frac{25}{3} \times \frac{18}{5}$
= 30 KMPH

5. (D) $x + x - 40^\circ + \frac{x}{4} - 5^\circ + 90^\circ = 360^\circ$

$$2x + \frac{x}{4} = 360^\circ + 40^\circ - 90^\circ + 5^\circ$$

$$\frac{8x + x}{4} = 315^\circ$$

$$9x = 315^\circ \times 4$$

$$x = \frac{315^\circ \times 4}{9} = 140^\circ$$

6. (A) Total area = 16 cm × 4 cm + 8 cm × 4 cm
= 96 cm²

7. (A) Given $d = 42$ cm

$$\text{Distance covered} = \pi d = \frac{22}{7} \times 42 \text{ cm} = 132 \text{ cm}$$

8. (D)
$$\frac{x^3 - y^3}{x^2 + xy + y^2} = \frac{10^3 - 11^3}{10^2 + 10 \times 11 + 11^2}$$

$$= \frac{1000 - 1331}{100 + 110 + 121}$$

$$= \frac{-331}{331} = -1$$

9. (A) Given $x + x + 10^\circ + x + 20^\circ = 180^\circ$

$$3x = 150^\circ$$

$$x = 50^\circ$$

$$\therefore x + 10^\circ = 60^\circ \text{ \& } x + 20^\circ = 70^\circ$$

10. (B) Area of shaded region

= Area of rectangle

– (Area of $\triangle GDF$ + area of $\triangle GAE$)

$$= 30 \text{ cm} \times 20 \text{ cm} - \left[\frac{1}{2} \times DF \times DG + \frac{1}{2} \times GA \times AE \right]$$

$$= 600 \text{ cm}^2 - \left[\frac{1}{2} \times 15 \text{ cm} \times 10 \text{ cm} + \frac{1}{2} \times 15 \text{ cm} \times 10 \text{ cm} \right]$$

$$= 600 \text{ cm}^2 - 150 \text{ cm}^2$$

$$= 450 \text{ cm}^2$$

11. (C) $\sqrt{12} = 2\sqrt{3}$ which is an irrational number

12. (B) $3^{x-2} = \frac{3^x}{3^2} = \frac{500}{9}$

13. (A) Compound ratio of 3 : 4 and 8 : 15

$$= 3 \times 8 : 4 \times 15 = 2 : 5$$

14. (B) Rectangle

15. (B) Given $x + x + 1 + x + 2 + x + 3 = 70$

$$4x + 6 = 70$$

$$4x = 64$$

$$x = 16$$

$$\therefore x + 3 = 16 + 3 = 19$$

16. (C) Given $2 [8x^2 + 3x + k] = 16x^3 - 6x^2 + 12x + 4$

$$2 [8x^2 + 3x + k] = 2 [8x^3 - 3x^2 + 6x + 2]$$

$$\therefore 8x^2 + 3x + k = 8x^3 - 3x^2 + 6x + 2$$

$$\therefore k = 8x^3 - 3x^2 - 8x^2 + 6x - 3x + 2$$

$$= 8x^3 - 11x^2 + 3x + 2$$

17. (A) Non terminating and non repeating numbers are irrational numbers

18. (B) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 = 1 + 8 + 27 + 64 + 125 = 225$

$$(1+2+3+4+5)^3 = 15^3 = 3375$$

$$(1+2+3+4+5)^2 = 15^2 = 225$$

$$\therefore 1^3 + 2^3 + 3^3 + 4^3 + 5^3 = (1+2+3+4+5)^2$$

19. (C) $\frac{2019^{2018}}{2019^{2017}} = 2019$

20. (B) Given $9^{2n} = 9^{x+m}$

$$\therefore 2x = x+m$$

$$x = m$$

21. (C) Length of KLMN = $10 \text{ cm} - 1 \text{ cm} - 1 \text{ cm} = 8 \text{ cm}$

$$\text{Breadth of KLMN} = 6 \text{ cm} - 2 \text{ cm} - 2 \text{ cm} = 2 \text{ cm}$$

$$\text{Perimeter of KLMN} = 2(l+b) = 2(8 \text{ cm} + 2 \text{ cm}) = 20 \text{ cm}$$

22. (A) $-\frac{2}{5} \div [1.2 + 0.8] = -\frac{2}{5} \times \frac{1}{2} = -\frac{1}{5} = -0.2$

23. (A) Perimeter of diagram

$$A = 2(12 \text{ cm} + 4 \text{ cm}) = 32 \text{ cm}$$

Perimeter of diagram

$$B = 12 \text{ cm} + 2 \text{ cm} + 12 \text{ cm} + 2 \text{ cm} + 10 \text{ cm} + 12 \text{ cm} + 2 \text{ cm}$$

$$= 52 \text{ cm}$$

Difference of perimeter

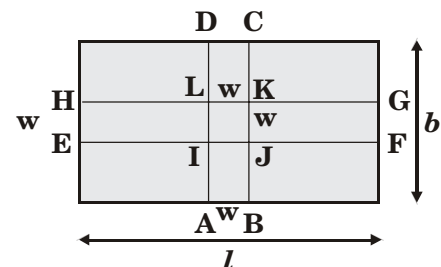
$$= 52 \text{ cm} - 32 \text{ cm} = 20 \text{ cm}$$

24. (D) $(3h - 2) - (2h - 1) = 5$

$$h - 1 = 5$$

$$h = 6$$

25. (B)



Area of ABCD + Area of EFGH – area of LKJI

$$lw + bw - w^2$$

$$lb - lb + lw + bw - w^2$$

$$lb - [lb - lw - bw + w^2]$$

$$lb - [(l - w)(b - w)]$$

PHYSICS

26. (A) The flow of current through appliance X is 0.7 amperes. So, 1 A fuse is suitable for it.

The flow of current through appliance Y is 1.8 amperes. So, 2 A fuse is suitable for it.

27. (A) When the end M of a metal rod given in the figure is heated, the drop w placed at 5 cm takes 2 minutes to fall off. Hence, for a drop at 10 cm to fall off, it takes 2×2 minutes = 4 minutes. Thus, the time taken by drops x, y, z are 4 minutes, 6 minutes and 10 minutes respectively.

28. (C) Convert km/h to m/s

$$= \frac{5 \cancel{10} \cdot 00 \text{ m}}{18 \cancel{36} \cdot 00 \text{ s}} = \frac{5}{18}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{40 \times 5}{18}$$

$$= 11.11 \text{ m/s.}$$

29. (C) (i) A concave lens always forms a virtual, erect and diminished image of an object.

(ii) A plane mirror always forms a virtual, erect image of the same size as that of the object.

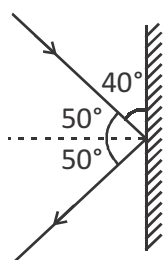
(iii) A concave mirror forms a virtual, erect and magnified image of an object.

30. (C) Constriction in a clinical thermometer prevents the mercury from flowing back to the bulb.

31. (C) Angle of incidence = angle between the incident ray and normal = 50°

Angle of reflection = angle between the reflected ray and normal = 50°

As per the laws of reflection $\angle i = \angle r$. So, angle of incidence is 50° and angle of reflection is also 50° as shown below.



32. (D) Light travels the fastest with a speed of $3 \times 10^8 \text{ m s}^{-1}$.

33. (C) If similar terminals of identical cells in the circuit are connected together, no electric current flows in the circuit.

Hence, the bulb does not glow.

34. (D) When current flows in an electric heater, electrical energy is converted to heat energy.

35. (B) The image formed by a plane mirror of an object is of the same size as the object but not smaller than the object.

CHEMISTRY

36. (C) As per the given information, the basic resource is water.

37. (D) Nitric acid is a strong acid and others are weak acids.

38. (B) Warm air rises higher as gases expand more when they absorb more heat. So, air at 40°C will rise the highest in the atmosphere.

39. (C) Toothpaste, milk of magnesia and shower cream are bases. They dissolve in water and turn red litmus paper to blue.

40. (C) In summer season, water consumption by all living beings will be more.

41. (C) When wet clothes are dried, water evaporates continuously due to sun's heat and wind. This process continues till the clothes become dry.

42. (A) Soap solution is basic in nature and turns colourless phenolphthalein pink.

43. (C) A ball falls to the ground because of gravity, not because of air or atmospheric pressure.

44. (A) The methods of water conservation are rain water harvesting and drip irrigation.

45. (C) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ is a neutralisation reaction.

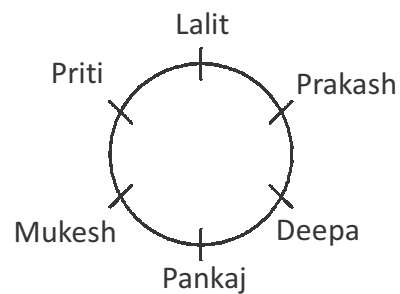
BIOLOGY

46. (B) Rice contain most carbohydrates.
47. (C) The flower is the reproductive organ of a plant.
48. (B) Small thin walled air sacs in lungs are called alveoli. Blood capillaries form a network around the alveoli. Oxygen from the alveoli is absorbed by the blood and is carried to different parts of the body. Carbon dioxide from the blood also enters the alveoli and is carried to the lungs for breathing out.
49. (C) Platelets or Thrombocytes. They help in clotting blood at the time of an injury.
50. (C) Lithosphere - Land
Hydrosphere - Water bodies
Atmosphere - Air
Autotrophs - Plants
Ruminant - Cow
51. (A) Plants like Bamboos and Eucalyptus should be regularly planted. These plants act as soil binders by not allowing top soil to run down with the flow of water. The roots of these plants hold the soil particles firmly together.

52. (C) Bones in birds are hollow.
53. (A) Deficiency of iron in the body causes Anaemia.
54. (C) Amoeba moves with the help of Pseudopodia.
55. (D) Forests are important because they cause rainfall, check floods, prevent soil erosion.

CRITICAL THINKING

56. (A) Malga = Peach, Juice = port, apple = mogga / grap
57. (A) Myanmar, Bhutan, Nepal, Pakistan
58. (A)



59. (D)
60. (B)

THE END
