UNIFIED COUNCIL
Foundation for Success

UNIFIED COUNCIL OLYMPIADS

nstse
Test • Assess • Achieve

NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION (UPDATED)

CLASS - 10

Question Paper Code : 1P204

KEY

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

SOLUTIONS

MATHEMATICS

01. (B) Given $\angle A + \angle B + \angle C = 180° \rightarrow (1)$

Given $\cos(B + C - A) = \frac{1}{2} = \cos 60°$

$-\angle A + \angle B + \angle C = 60° \rightarrow (2)$

$\angle A + \angle B + \angle C = 180° \rightarrow (1)$

$-\angle A + \angle B + \angle C = 60° \rightarrow (2)$

(+) (–) (–) (–)

$2\angle A = 120°$

$\angle A = \frac{120°}{2} = 60°$

02. (B) a, b, c are in A.P

So 2b = a + c,

then straight line $ax + by + c = 0$ will pass through (1, –2) because the line satisfies the condition a – 2b + c = o or 2b = a + c.

03. (D)

$$\sqrt{\left[\left(\sqrt{3}+1\right)-\left(\sqrt{3}-1\right)^{-2}+\left[\left(\sqrt{2}-1\right)-\left(\sqrt{2}-1\right)^{-2}\right]\right]}$$

$$\sqrt{(2)^2+(2)^2} = 2\sqrt{2}$$

04. (C) Given $(x^2 - x - 2)$ is a factor of

$P(x) = lx^4 + mx^3 + 2x^2 + 4$

$\therefore$ $(x^2 - x - 2)$ factors i.e $(x - 2)$ and

$(x + 1)$ also factor of $P(x)$

$(x - 2)$ is a factor of $P(x)$

$P(2) = 0$

$P(2) = 16l + 8m + 8 + 4 = 0$

$16l + 8m = -12$

$4(4l + 2m) = -12$

$$4l + 2m = \frac{-12}{4}$$

$4l + 2m = -3 \rightarrow (1)$

$(x + 1)$ is also a factor of $P(x)$

$\Rightarrow P(-1) = 0$

$P(-1) = l - m + 2 + 4 = 0$

$l - m = -6$

$$\begin{array}{l} 4l + 2m = -3 \rightarrow (1) \\ 2l - 2m = -12 \\ \hline 6l \quad\quad = -15 \end{array}$$

$$l = \frac{-15}{6} = \frac{-5}{2}$$

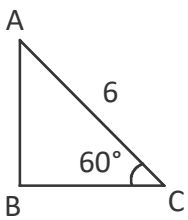
$$\frac{-5}{2} - m = 6 \rightarrow (2)$$

$$\frac{-5}{2} + 6 = m$$

$$m = \frac{-5 + 12}{2} = \frac{7}{2}$$

$\therefore$ $$l + m = \frac{-5}{2} + \frac{7}{2} = \frac{-5 + 7}{2} = \frac{2}{2} = 1$$

05. (B) $$\sin 60° = \frac{AB}{AC}$$

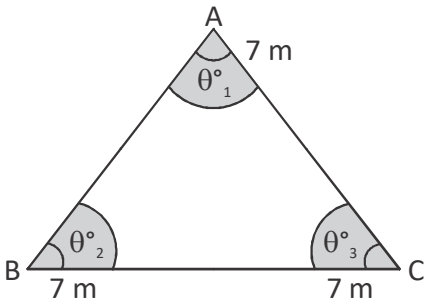


$$\frac{\sqrt{3}}{2} = \frac{AB}{6} \Rightarrow \frac{6\sqrt{3}}{2} = AB$$

$\Rightarrow 3\sqrt{3} = AB$

06. (A) Let $\angle A = \theta_1°$, Let $\angle A = \theta_1°$,

Area which can be grazed by the horses = sum of the area of three sectors with central angles $\theta_1°$, $\theta_2°$ and $\theta_3°$, and each with r = 7 m



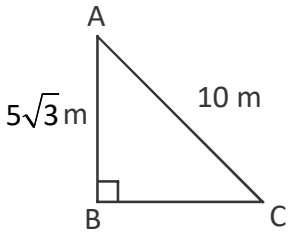
$$= \left(\frac{\pi r^2\theta_1}{360} + \frac{\pi r^2\theta_2}{360} + \frac{\pi r^2\theta_3}{360}\right) m^2, \text{ where } r = 7 \text{ m}$$

$$= \frac{\pi r^2}{360°}(\theta_1 + \theta_2 + \theta_3)\ m^2 = \left(\frac{\pi r^2 \times 180°}{360°}\right) m^2$$

$[\because \theta_1 + \theta_2 + \theta_3 = \angle A + \angle B + \angle C = 180°]$

$$= \left(\frac{22}{7} \times 7 \times 7 \times \frac{1}{2}\right) m^2 = 77\ m^2$$

07. (A)



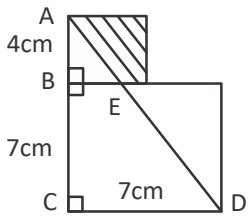
$$\cos A = \frac{AB}{AC}$$

$$= \frac{5\sqrt{3}}{10} = \frac{\sqrt{3}}{2}$$

$$\cos A = \frac{\sqrt{3}}{2} = \cos 30°$$

$\therefore \angle A = 30°$

08. (A)



$\Delta ABE \sim \Delta ACD$

$\therefore \quad \frac{AB}{AC} = \frac{BE}{CD}$

$\Rightarrow \frac{4cm}{11cm} = \frac{BE}{7cm}$

$\therefore \quad BE = \frac{7 \times 4cm}{11} = \frac{28cm}{11}$

Area of ΔABE

$= \frac{1}{2} \times AB \times BE = \frac{1}{\cancel{2}_1} \times \cancel{4}^{2}\,cm \times \frac{28}{11}cm$

$= \frac{56cm^2}{11}$

Area of shaded region $= (4cm)^2 - \frac{56}{11}cm^2$

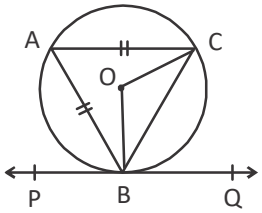
$= \frac{176cm^2 - 56cm^2}{11}$

$= \frac{120}{11}cm^2$

09. (Del)

10. (D) Construction :- Join OB and OC

Proof :- In ΔABC, AB = AC



$\Rightarrow \angle ABC = \angle ACB = 50°$

In ΔABC, $50° + 50° + \angle A = 180°$

$\angle A = 180° - 100° = 80°$

$\therefore \quad \angle BOC = 2\angle A = 2 \times 80° = 160°$

In ΔBOC, OB = OC

$\Rightarrow \angle OCB = \angle OCB = x$

$x + x + 160° = 180°$

$2x = 180° - 160° = 20°$

$x = 10° \Rightarrow \angle OBC = 10°$

But $\angle OBC + \angle CBQ = 90°$ [A tangent is perpendicular to the radius]

$\therefore \quad 10° + \angle CBQ = 90°$

$\angle CBQ = 80°$

11. (C) LHS

$$= 1 + \frac{1}{\left(\frac{6}{2}\right)} + \frac{1}{\left(\frac{12}{2}\right)} + \frac{1}{\left(\frac{20}{2}\right)} + ... + \frac{1}{\left(\frac{2024 \times 2025}{2}\right)}$$

$$= 1 + \frac{2}{6} + \frac{2}{12} + \frac{2}{20} + ... + \frac{2}{2024 \times 2025}$$

$$= 1 + 2\left[\frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + ... + \frac{1}{2024 \times 2025}\right]$$

$$= 1 + 2\left[\frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \frac{1}{4} - \frac{1}{5} + ... + \frac{1}{2024} - \frac{1}{2025}\right]$$

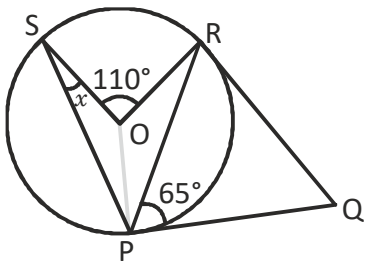
$$= 1 + 2\left[\frac{1}{2} - \frac{1}{2025}\right]$$

$$= 1 + 2\left[\frac{2025 - 2}{2 \times 2025}\right]$$

$$= \frac{2025 + 2023}{2025}$$

$$= \frac{4048}{2025}$$

12. (B) Construction:- Join $\overline{OP}$



OP $\perp$ PQ $\Rightarrow \angle OPR + \angle RPQ = 90°$

$\Rightarrow \angle OPR + 65° = 90°$

$\therefore \quad \angle OPR = 25°$

But $\angle SPR = \frac{\angle SOR}{2} = \frac{110^\circ}{2} = 55^\circ$

$\angle SPR = \angle OPR + \angle OPS = 55^\circ$

$25^\circ + \angle OPS = 55^\circ$

$\angle OPS = 55^\circ - 25^\circ = 30^\circ$

$\therefore$ $x = \angle OPS = 30^\circ$

13. (C) $a_2 - a_1 = \frac{2}{3} - \frac{3}{4} = \frac{8-9}{12} = \frac{-1}{12}$

$a_3 - a_2 = \frac{7}{12} - \frac{2}{3} = \frac{7-8}{12} = \frac{-1}{12}$

$a_2 - a_1 = a_3 - a_2 \Rightarrow$ Given series in AP

$S_n = \frac{n}{2}\left[2a + (n-1)d\right]$

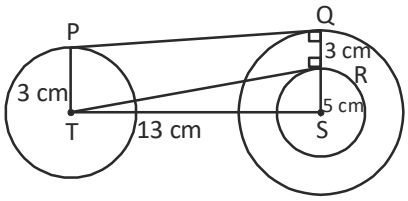
$S_{25} = \frac{25}{2}\left[2 \times \frac{3}{4} + (25-1)\left(\frac{-1}{12}\right)\right]$

$= \frac{25}{2}\left[\frac{3}{2} + 24 \times \frac{-1}{12}\right]$

$= \frac{25}{2}\left(\frac{3-4}{2}\right)$

$= 25 \times \frac{-1}{4} = \frac{-25}{4}$

14. (B)



Cost : Draw a circle of radius (8cm – 3cm) i.e., 5 cm of centre 'S'. Join TR

PQRT is a rectangle of breadth 3 cm

In ΔRST, $\angle R = 90^\circ$ and SR = 5 cm

$\therefore TR = \sqrt{TS^2 - SR^2} = 12\text{cm}$

15. (D) $LHS = \frac{1}{1-\text{Sin}^2\theta} + \frac{1}{1+\text{Sin}^2\theta} + \frac{2}{1+\text{Sin}^4\theta}$

$+ \frac{4}{1+\text{Sin}^8\theta}$

$= \frac{1+\cancel{\text{Sin}^2\theta}+1-\cancel{\text{Sin}^2\theta}}{1-\text{Sin}^4\theta} + \frac{2}{1+\text{Sin}^4\theta} + \frac{4}{1+\text{Sin}^8\theta}$

$= \frac{2\left(1+\text{Sin}^4\theta\right)+2\left(1-\text{Sin}^4\theta\right)}{1-\text{Sin}^8\theta} + \frac{4}{1+\text{Sin}^8\theta}$

$= \frac{4}{1-\text{Sin}^8\theta} + \frac{4}{1+\text{Sin}^8\theta}$

$= \frac{4\left(1+\text{Sin}^8\theta\right)+4\left(1-\text{Sin}^8\theta\right)}{1-\text{Sin}^{16}\theta}$

$= \frac{8}{\left(1-\frac{1}{5}\right)} = \frac{8}{\left(\frac{4}{5}\right)} = 10$

16. (A) Given $3^x + 5^y = 8$

Let $3^x = a$ and $5^y = b$

$\therefore$ $a + b = 8 \rightarrow (1)$

Given $3^{x+2} + 5^{y+1} = 52$

$\Rightarrow 3^x \times 3^2 + 5^y \times 5 = 52$

$9a + 5b = 52 \rightarrow 2$

$9a + 5b = 52 \rightarrow (2)$

$5a + 5b = 40 \rightarrow$ equ (1) × 5

(–) (–) (–)

$4a = 12$

$a = \frac{12}{4} = 3$

$3 + b = 8$

$b = 8 - 3$

$b = 5$

$\therefore$ $3^x = a = 3$

$\therefore$ $x = 1$

$5^y = b = 5$

$\therefore$ $y = 1$

$x - 2y = 1 - 2(1)$

$= 1 - 2$

$\therefore$ $= -1$

17. (D) $y = 5$ line and $y = 1 + x$ line intersect at (4, 5)

$y = 5$ line and $y = 1 - x$ line intersect at (–4, 5)

$y = 1 + x$ line and $y = 1 - x$ line intersect at (0, 1)

$\therefore$ Area of the triangle with vertices (4, 5), (–4, 5) and (0, 1)

$$= \frac{1}{2}\left|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right|$$

$$= \frac{1}{2}\left|4(5-1) - 4(1-5) + 0(5-5)\right| = 16 \text{ sq units}$$

18. (A) If two numbers written in a prime factoristion, then their LCM is the product primes with highest powers

$\therefore$ LCM of $2^5 \times 3^6 \times 7^4 \times 11$ and $2^6 \times 3^4 \times 5^6 \times 7^2 = 2^6 \times 3^6 \times 5^6 \times 7^4 \times 11$

19. (B) Given α, β are the roots of

$2x^2 + 20x + K^2 - 13 = 0$

and $\beta = 4\alpha$

$$\alpha + \beta = \frac{-b}{a} = \frac{-20}{2} = -10$$

$\alpha + 4\alpha = -10$

$5\alpha = -10$

$$\alpha = \frac{-10}{5} = -2$$

$$\alpha\beta = \frac{c}{a} = \frac{K^2 - 13}{2}$$

$$\alpha \times 4\alpha = \frac{K^2 - 13}{2}$$

$$4\alpha^2 = \frac{K^2 - 13}{2}$$

$$4 \times (-2)^2 = \frac{K^2 - 13}{2}$$

$16 \times 2 = K^2 - 13$

$K^2 = 32 + 13$

$K = \sqrt{45} = 3\sqrt{5}$

20. (C) Given $p(x) = 2x^4 - 9x^3 + 5x^2 + 3x - 1$

$$p\left(-\frac{1}{2}\right) = 2\left(-\frac{1}{2}\right)^4 - 9\left(-\frac{1}{2}\right)^3 + 5\left(-\frac{1}{2}\right)^2 + 3\left(-\frac{1}{2}\right) - 1$$

$$= 2 \times \frac{1}{16} - 9\left(-\frac{1}{8}\right) + 5\left(\frac{1}{4}\right) \frac{-3}{2} - 1$$

$$= \frac{1}{8} + \frac{9}{8} + \frac{5}{4} - \frac{3}{2} - 1$$

$$= \frac{1 + 9 + 10 - 12 - 8}{8}$$

$$= \frac{20 - 20}{8}$$

$p\left(-\frac{1}{2}\right) = 0 \Rightarrow (2x + 1)$ is a factor of $p(x)$.

21. (B) Given $\frac{3}{m+n} = \frac{4}{2(m-n)} = \frac{12}{(5m-1)}$

$\therefore$ $\frac{3}{m+n} = \frac{2}{m-n} \Rightarrow 3m - 3n = 2m + 2n$

$\Rightarrow m = 5n$

But $\frac{4}{2(m-n)} = \frac{12}{5m-1}$

$$\Rightarrow \frac{2}{(5n-n)} = \frac{12}{5(5n)-1}$$

$$\frac{2}{4n} = \frac{12}{25n-1}$$

$24n = 25n - 1$

$n = 1$

$\therefore$ $m = 5n = 5$

22. (A) Given $\cos^2\theta - 3\cos\theta + 2 = \sin^2\theta$

$\cos^2\theta - 3\cos\theta + 2 = 1 - \cos^2\theta$

$\cos^2\theta + \cos^2\theta - 3\cos\theta + 2 - 1 = 0$

$2\cos^2\theta - 3\cos\theta + 1 = 0$

$2\cos^2\theta - 2\cos\theta - \cos\theta + 1 = 0$

$2\cos\theta(\cos\theta - 1) - 1(\cos\theta - 1) = 0$

$(\cos\theta - 1)(2\cos\theta - 1) = 0$

$\cos\theta - 1 = 0$ (or) $2\cos\theta - 1 = 0$

$\cos\theta = 1$ (or) $2\cos\theta = 1$

$\cos\theta = \cos 0°$ $\cos\theta = \frac{1}{2} \Rightarrow \cos\theta = \cos 60°$

$\theta = 0°$ $\theta = 60°$

23. (B) Given $\frac{x+y}{\sqrt{xy}} = \frac{10}{3}$

$\Rightarrow \frac{10}{\sqrt{xy}} = \frac{10}{3} \Rightarrow \sqrt{xy} = 3$

[$\because$ Given $x + y = 10$]

$\therefore xy = 9$

$(x-y)^2 = (x+y)^2 - 4xy = (10)^2 - 4 \times 9$

$= 100 - 36$

$x - y = \pm\sqrt{64}$

$x - y = \pm 8$

24. (A) $2\left(p^2 - \frac{1}{q^2}\right) = 2 \times \frac{2}{2}\left(p^2 - \frac{1}{q^2}\right)$

$= \frac{1}{2}\left(4p^2 - \frac{4}{q^2}\right)$

$= \frac{1}{2}(\sec^2\theta - \tan^2\theta)$

$= \frac{1}{2}$

25. (C) Let the number of cones be x

Given x cones volume = volume of the sphere

$$x \times \frac{1}{3} \times \pi \times \frac{3.5}{2} \times \frac{3.5}{2} \times 3\ \text{cm}^3 = \frac{4}{3}\pi \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}\text{cm}^3$$

$$x = \frac{4}{3}\pi \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}\text{cm}^3 \times \frac{1}{\pi} \times \frac{2}{3.5} \times \frac{2}{3.5}\text{cm}^3$$

$x = 504$

PHYSICS

26. (D) Same current flows through every part of the circuit having resistance connected in series to a cell or a battery. So, the current recorded in the ammeter when the key is closed will be the same in all the circuits.

27. (C) Concave mirror forms a magnified (enlarged) image of the object (head of girl) if the object is placed close to the concave mirror (i.e., at a distance less than its focal length).

Plane mirror always forms the image of the same size as that of the object (middle part of girl).

28. (D) The lines of force are continuous inside a magnet. The magnetic lines of force always diverge at North-pole and converge towards South-pole.

29. (D) For distance viewing f = ?, P = –5.5 D

Clearly, $f = \frac{100}{P} = \frac{100}{-5.5} = -18.2\ \text{cm}$

(ii) for near vision correction, P = +1.5 D

Therefore, $f = \frac{100}{P} = \frac{100}{+1.5} = +66.7\ \text{cm}$

30. (D) The graph between V and I across a resistance R is a straight line passing through the origin.

31. (D) Use the lens equation

$$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

Where u is the object distance, v is the image distance and f is the focal length.

$$\frac{1}{50} + \frac{1}{v} = \frac{1}{20}$$

$$\frac{1}{v} = \frac{1}{20} - \frac{1}{50}$$

v = 33.3 cm

32. (B) If the forefinger shows the direction of the magnetic field and the thumb indicates the motion of the conductor, then, according to Fleming's left hand rule, the middle finger point at the direction of current.

33. (C) As the student uses spectacles containing converging lens or convex lens he suffers from hypermetropia. The main reason for the defect of the eyes is due to the low converging power of eye lens because the ciliary muscles attached to the eye lens become weak and cannot make eye lens fatter to increase its converging power. In other cases, the eye ball can be too short due to which the retina is at a smaller distance from the eye lens.

34. (D) The refractive indices of four substances are given below:

(a) Water = 1.33

(b) Kerosene oil = 1.44

(c) Mustard oil = 1.46

(d) Glycerine = 1.47

Higher the refractive index of a liquid, more it will change the direction of light passing through it. The ray would bend the most, when it goes from rarer medium (air) to the most denser medium. As refractive index of glycerine is the highest among other liquids, so, glycerine would bend the most.

35. (C) When R_1 and R_2 are connected in parallel, net resistance (R_p) is given by

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{R_1 + R_2}{R_1 R_2}$$

Or $$R_P = \frac{R_1 R_2}{R_1 + R_2} = 3 \quad \text{.....} \quad \text{(i)}$$

When R_1 and R_2 are connected in series, net resistance (R_S) given by

$R_S = R_1 + R_2 = 16$ ..... (ii)

From eqns, (i) and (ii),

$$\frac{R_1 R_2}{16} = 3 \text{ or } R_1 R_2 = 48$$

or $R_1(16 - R_1) = 48$

(as $R_1 + R_2 = 16$, $R_2 = 16 - R_1$)

or $16R_1 - R_1^2 = 48$

or $R_1^2 - 16R_1 + 48 = 0$

or $R_1^2 - 4R_1 - 12R_1 + 48 = 0$

or $R_1(R_1 - 4) - 12(R_1 - 4) = 0$

or $(R_1 - 12)(R_1 - 4) = 0$

Thus, either $R_1 = 12\,\Omega$ or $4\,\Omega$

From eqn (i), $R_2 = 4\,\Omega$ or $12\,\Omega$

Therefore, the resistances of two resistors are $4\,\Omega$ and $12\,\Omega$.

CHEMISTRY

36. (A) MgO is a basic oxide while ZnO is an amphoteric oxide.

37. (C,D) $C + O_2 \rightarrow CO_2$ + Heat is an example of heterogeneous, exothermic, irreversible and redox reaction.

38. (D) A homologous series is a series of compounds all having the same general formula and similar chemical properties and each member of the series differing by the unit – CH_2. Members of a homologous series contain the same functional group. They show similar chemical properties but vary in reactivity. The physical properties of the members change gradually with an increase of carbon atoms.

39. (D) All acids and all bases have in common the ions. Acids have H^+ ion and a non-metallic anion. Bases have OH^- ion and a metallic cation.

40. (C) The correct order of the ease of reduction of the metal oxides is the one where the metals are listed in increasing order of difficulty to reduce.

The order of reduction ease from easiest to most difficult is iron, lead, zinc.

41. (C) A chemical reaction must follow the law of conservation of mass.

42. (C) Soap acts by forming micelles and trapping the fat within the micelles - correct

Soap molecules work as a bridge between polar water molecules and non-polar oil molecules - correct

Soap is formed by saponification of oils is a chemical change - incorrect

Soap is an emulsifier - correct

43. (B) A white compound on heating produces a mixture of gases that turns moist universal indicator paper red and relights a glowing splinter. The mixture contains an acidic gas and oxygen.

44. (A) $4Zn + 10HNO_3 \rightarrow 4Zn(NO_3)_2 + 5H_2O + N_2O$

45. (B) When ZnO reacts with NaOH (a strong base), sodium zincate (Na_2ZnO_2) and water (H_2O) are formed.

BIOLOGY

46. (C) Plants carry out photosynthesis to produce oxygen and food in the form of sugar by using carbon dioxide and water.

47. (C) (ii) is the stomach, which secretes pepsin and (iv) is the pancreas, which secretes trypsinogen. These enzymes help to break down proteins.

48. (C) The thin walls of the small intestine have many finger-like projections (villi) with many blood vessels to absorb the digested food into the bloodstream efficiently.
- The finger-like projections increase the surface area for absorption of food.
- The blood in the blood vessels carries the digested food to different parts of the body.

49. (B) The movement of food in phloem is called translocation.

50. (C) The given figure is of alveoli.

51. (B) Part 2 is the anthers, which are the site of production of pollen grains.

52. (C) The digested food passes through the walls of the small intestines. The thin walls of the small intestines have many finger-like projections (villi) with many blood vessels to absorb the digested food into the bloodstream efficiently.
- The finger-like projections increase the surface area for absorption of food.
- The blood in the blood vessels carries the digested food to different parts of the body.

53. (B) In parasitic nutrition an organisms obtains its food from other organisms.

54. (B) In mitochondria the breakdown of Pyruvate takes place.

55. (C) Haemoglobin is the respiratory pigment.

CRITICAL THINKING

56. (A) A flame needs fuel and oxygen to continue burning. The wax provides the fuel in all of three instances. There is air exchange in jar C, so more oxygen can be used by the candle to continue burning. Jars A and B are closed systems. No oxygen can get in. Once the oxygen is used up the flame will suffocate itself. The air available in the small jar. A, is less than that in the large jar, B, therefore A shall be extinguished first.

57. (C) $N=8 + 2(a - 1)$

'N' is the number of white squres

'a' is the figure number

Every time 2 squares added to each figure...

$N = 8 + 2(a - 1)$

$50 = 8 + 2 (a - 1)$

$= 8 + 2a - 2$

$50 = 6 + 2a$

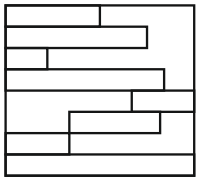
$50 - 6 = 2a$

$44 = 2a$

$a = 22$

58. (B) After interchanging the slots of S and T, the dance form at 9:30 am will still be Karnataka (Option B).

	9:00 am (S)	9:15 am (Q)	9:30 am (T)	9:45 am (P)	10:00 am (R)
Tamil Nadu (T)			✔		
Telangana (P)				✔	
Maharashtra (Q)		✔			
Karnataka (S)	✔				
Odisha (R)					✔

59. (C) 

60. (B) Analyzing the paragraph, we can see the reason for Coca-Cola's investment:

"The move...again puts the spotlight on how critical growth in emerging markets like India is for multinational firms dealing with slowdown or stagnant sales in the US and European markets."

"India has passed a certain threshold for the Coca-Cola system; we see this market as a determining factor in our growth story."

These statements highlight the primary reason for the investment.

Therefore, the correct answer is (B) To capitalize on the critical growth in emerging markets like India.

The End