UNIFIED COUNCIL
Foundation for Success

UNIFIED COUNCIL OLYMPIADS

nstse
Test • Assess • Achieve

NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

CLASS - 10

Question Paper Code : 10109

KEY

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

SOLUTIONS

MATHEMATICS

01. (D) $\cos30°\cos45° - \sin30°\sin45°$

$$= \frac{\sqrt{3}}{2}\times\frac{1}{\sqrt{2}} - \frac{1}{2}\times\frac{1}{\sqrt{2}}$$

$$= \frac{1}{\sqrt{2}}\left(\frac{\sqrt{3}}{2} - \frac{1}{2}\right)$$

$$= \frac{1}{\sqrt{2}}\left(\frac{\sqrt{3}-1}{2}\right) = \frac{\sqrt{3}-1}{2\sqrt{2}}\times 2$$

$$= \frac{\sqrt{2}(\sqrt{3}-1)}{4}$$

02. (C) Given $\sin\theta - \cos\theta = 0$

$\sin\theta = \cos\theta$

$\Rightarrow \theta = 45°$

$\therefore \sin^4\theta + \cos^4\theta = (\sin45°)^4 + (\cos45°)^4$

$$= \left(\frac{1}{\sqrt{2}}\right)^4 + \left(\frac{1}{\sqrt{2}}\right)^4$$

$$= \frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$$

03. (C) Let's the point (o, y) divide the line segment joinily the point (–3, 4) and (2, 6) in the ratio m:n, then,

$$\frac{2m-3n}{m+n} = 0 \Rightarrow 2m = 3n \text{ (or) } \frac{m}{n} = \frac{3}{2}$$

04. (B) Mid point of QS =

$$\left(\frac{6+18}{2},\frac{10+10}{2}\right)=(12,10)$$

Given (12, 10) be the midpoint of PR.

Let R be (x, y)

$$\therefore \left(\frac{10+x}{2},\frac{4+y}{2}\right)=(12,10)$$

$\frac{10+x}{2}=12$ and $\frac{y+4}{2}=10$

$\therefore$ 10 + x = 24 and y + 4 = 20

$\Rightarrow$ x = 24 – 10 and y = 20 – 4 = 16

x = 14 and y = 16

$\therefore$ R = (x, y) = (14, 16)

05. (B) Given AD = 14 cm

Given $DF = FG = \frac{AD}{2} = 7\,cm$

$$DE = EF = \frac{DF}{2} = \frac{7cm}{2}$$

Area of shaded region

$$= \frac{60^\circ}{360^\circ_{6}}\pi\left[3.5\times3.5+14\times14-7\times7\right]cm^2$$

$$= \frac{1}{6_3}\times\frac{22^{11}}{7}\left[12.25+196-49\right]cm^2$$

$$= \frac{11}{21}\times159.25\,cm^2$$

$$= \frac{11}{21_3}\times\frac{637^{91}}{4}cm^2 = \frac{1001}{12}cm^2$$

$\therefore$ Area of unshaded portion

$$= \frac{1}{4}\times\pi\times14\times14\ cm^2 - \frac{1001}{12}\ cm^2$$

$$= \frac{1}{\cancel{4}_{\cancel{2}}}\times\frac{22}{\cancel{7}_1}\times\cancel{14}^{\cancel{7}^1}\times\cancel{14}^{7}\ cm^2 - \frac{1001}{12}\ cm^2$$

$$= 154\ cm^2 - \frac{1001}{12}\ cm^2 = \frac{1848-1001}{12}\ cm^2$$

$$= \frac{847}{12}\ cm^2 = 70\frac{7}{12}\ cm^2$$

06. (B) Given $\left(2^4\right)^{\left(x^2+3x-1\right)} = \left(2^3\right)^{\left(x^2+3x+2\right)}$

$2^{4x^2+12x-4} = 2^{3x^2+9x+6}$

$\therefore$ $4x^2 + 12x - 4 = 3x^2 + 9x + 6$

$4x^2 - 3x^2 + 12x - 9x - 4 - 6 = 0$

$x^2 + 3x - 10 = 0$

$x^2 + 5x - 2x - 10 = 0$

$x(x + 5) - 2(x + 5) = 0$

$(x + 5)(x - 2) = 0$

$\therefore$ x = –5 (or) 2

$\therefore$ sum of all values of x = –5 + 2 = –3

07. (B) LHS = (1 + 2 + 3 – 4) + (5 + 6 + 7 – 8) + (9 + 10 +11 – 12) + ... +(197 + 198 + 199 – 200)

= 2 + 10 +18 + 26 + ... + 394

[$\because$ They are in AP $l_n = \frac{n}{2}(a + l)$]

$= \frac{50}{2}[2 + 394] = 396 \times \frac{100}{4} = 9900$

08. (A) Given LCM + ~~HCF~~ = 1,94,292_____ (1)

LCM – ~~HCF~~ = 1,93,788_____ (2)

(–) (–)

2 LCM = 388080

$LCM = \frac{388080}{2} = 1,94,040$

1,94,040 + HCF = 1,94,292

HCF = 1,94,292 – 1,94,040

= 252

But product of two numbers

= LCM × HCF

2520 × x = 194040 × 252

$x = \frac{194040\times252}{2520} = 19404$

09. (A) Given $4\sin^2\theta + 10\sin^2\theta + 10\cos^2\theta = 11$

$4\sin^2\theta + 10 = 11$

$4\sin^2\theta = 1$

$\therefore \sin^2\theta = \frac{1}{4}$

$\sin\theta = \frac{1}{2} = \sin 30°$

$\therefore \theta = 30°$

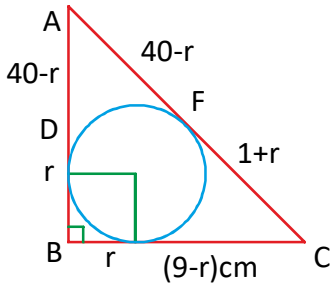
$\tan\theta + \cot\theta = \tan 30° + \cot 30°$

$= \frac{1}{\sqrt{3}} + \sqrt{3} = \frac{1+3}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

10. (C) Given $\angle B = 90°$

$AC^2 = AB^2 + BC^2$

$= 40^2 + 9^2$



$AC = \sqrt{1681} = 41$

Let the radius of the circle be 'r'

$\therefore$ BD = r & AD = 40 – r

AF = 40 – r

BE = r

CE = 9 – r

CF = AC – AF = 41 cm – (40 – r)cm = (41 – 40 + r)cm

CF = (1 + r)cm

But CE = CF

9 – r = 1 + r

2r = 8

r = 4 cm (or) $\Delta = rs$

$r = \frac{\Delta}{s} = \frac{\frac{1}{2}\times 40\times 9\,cm^2}{\frac{1}{2}(40+41+9)cm}$

$= \frac{40\times 9\ cm}{90} = 4\ cm$

11. (C) Area of circle A = $3.14 \times 10 \times 10\ cm^2$

$= 314\ cm^2$

Area of circle B = $3.14 \times 8 \times 8\ cm^2$

$= 200.96\ cm^2$

Area of square = $7 \times 7\ cm^2 = 49\ cm^2$

Area of shaded regin Q

$= \frac{1}{\cancel{8}} \times 3.14 \times \cancel{8} \times 8 = 25.12$

$\therefore 4x = 25.12$

$\therefore x = \frac{25.12}{4}$

Area of shaded region P = $5x$

$= 5 \times \frac{\cancel{25.12}^{6.28}}{\cancel{4}_{1}}$

$= 31.4\ cm^2$

Area of shaded part = Area of (circle A + circle B) + Area of square – 2 times area of P – 2 times area of Q

$= (314 + 200.96 + 49 - 2 \times 25.12 - 2 \times 31.4)\ cm^2$

$= 450.92\ cm^2$

12. (D) Given $\sqrt{x+1} + \sqrt{x-2} = \sqrt{x+3}$

squaring on both sides

$x+1+x-2+2\sqrt{(x+1)(x-2)} = x+3$

$2\sqrt{(x^2-x-2)} = (4-x)$

squaring on both sides

$4(x^2 - x - 2) = 16 - 8x + x^2$

$4x^2 - x^2 - 4x + 8x - 8 - 16 = 0$

$3x^2 + 4x - 24 = 0$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-4 \pm \sqrt{16+288}}{2\times 3}$

$= \frac{-4 \pm \sqrt{304}}{6}$

$= \frac{-4 \pm \sqrt{4\times 4\times 19}}{6} = \frac{-4 \pm 4\sqrt{19}}{6}$

$x = \frac{\cancel{2}(-2 \pm 2\sqrt{19})}{\cancel{6}_{3}}$

13. (C) Given $4\pi r^2 \times \frac{20p}{cm^2} = ₹\ 1108.8$

$\frac{88}{7} \times r^2 \times ₹\ \frac{1}{5\ cm^2} = ₹\ 1108.8$

$\therefore r^2 = ₹\ 1108.8 \times 5\ cm^2 \times \frac{7}{88}$

$= ₹\ 5544 \times \frac{7}{88}$

$r = \sqrt{3\times3\times7\times7}$ cm

r = 21 cm

Volume = $\frac{4}{3}\pi r^2$

$= \frac{4}{3}\times\frac{22}{7} \times 21 \times 21 \times 21\ cm^3$

$= 38808\ cm^3$

14. (A) Given volume of cone = volume of cuboid

$\Rightarrow \frac{1}{3}\pi r^2 H = lbh$

$\Rightarrow \frac{1}{3}\times\frac{22}{7_1}\times r^2 \times \cancel{28}^{4}\ cm^3 = 64\times44\times24\ cm^3$

$r^2 = 64 \times 44 \times 24 \times 3 \times \frac{1}{22}\times\frac{1}{4}$

$r^2 = 2304\ cm^2$

$\therefore$ r = 48 cm

15. (B) Given $a = 3\sqrt{2}$ & $d = 4\sqrt{2} - 3\sqrt{2} = \sqrt{2}$

$a_{10} = a + 9d = 3\sqrt{2} + 9\sqrt{2} = 12\sqrt{2}$

$= \sqrt{144\times2} = \sqrt{288}$

16. (C) Factors of 5 are 1 & 5 (or) –5 & –1

Given $f(x) = x^3 - ax^2 - 69x + 5$

f(1) = 13 – 9(1)2 – 69(1) + 6

= –72

$f(1) \neq 0$

$f(-5) = (-5)3 - 9(-5)^2 - 69(-5) + 5$

$= -125 - 225 + 345 + 5 = 0$

$(x + 5)$ is a factor of $f(x)$

$x + 5 \overline{)\ x^3 - 9x^2 - 69x + 5\ \big|\ x^2 - 14x + 1}$

$x^3 + 5x^2$

(–) (–)

$-14x^2 - 69x + 5$

$-14x^2 - 70x$

$x + 5$

$x + 5$

0

$x^2 - 14x + 1 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{-(-14) \pm \sqrt{196 - 4\times1}}{2}$

$= \frac{14 \pm \sqrt{192}}{2}$

$= \frac{14 \pm 8\sqrt{3}}{2}$

$= 7 \pm 4\sqrt{3}$

17. (A) $18(6x^4 + x^3 - x^2) = 18x^2(6x^2 + x - 1)$

$= 18x^2\ (6x^2 + 3x - 2x - 1)$

$= 18x^2[3x(2x + 1) - 1(2x + 1)]$

$= 9x^2\ (2x + 1)(3x - 1)$

$45(2x^6 + 3x^5 + x^4) = 45x^4(2x^2 + 3x + 1)$

$= 45x^2(2x^2 + 2x + x + 1)$

$= 45x^2[2x(x + 1) + 1(x + 1)]$

$= 9 \times 5x^2\ (x + 1)(2x + 1)$

$\therefore$ HCF of $18(6x^4 + x^3 - x^2)$ and $45(2x^6 + 3x^5 + x^4) = 9x^2(2x + 1)$

18. (D) Let GK be the upper surface of the lake, C be the position of the cloud and O be the point of observation. Let D be the reflection of the cloud C in the lake.

Then, in the figure we have :

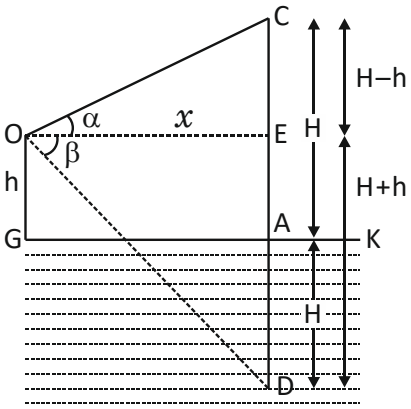
OG = h, $\angle COE = \alpha$ and $\angle EOD = \beta$

Let OE = x and CA = AD = H

Then, CE = CA – EA = CA – OG = H – h

and ED = AD + EA = AD = OG = H + h

In rt. ΔOCE, we have :



$$\frac{CE}{OE} = \tan\alpha \quad \Rightarrow \frac{H-h}{x} = \tan\alpha$$

$\Rightarrow$ H – h = x tanα

$\Rightarrow$ H = h + x tanα ..... (i)

In rt. ΔODE, we have :

$$\frac{ED}{OE} = \tan\beta \Rightarrow \frac{H+h}{x} = \tan\beta$$

$\Rightarrow$ H + h = x tanβ

$\Rightarrow$ H = x tanβ – h ..... (ii)

From (i) and (ii), we get :

h + x tanα = x tanβ – h

$$\Rightarrow x = \frac{2h}{(\tan\beta - \tan\alpha)} \quad \text{.... (iii)}$$

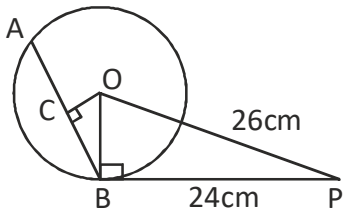
Now, in rt. ΔOCE, we have :

$$\frac{OC}{OE} = \sec\alpha \Rightarrow OC = x\sec\alpha$$

$$\Rightarrow OC = \frac{2h\sec\alpha}{(\tan\beta - \tan\alpha)} \quad \text{[Using (ii)]}$$

Thus, the distance of the cloud from the point of observation is $\frac{2h\sec\alpha}{(\tan\beta - \tan\alpha)}$.

19. (A) In ΔPOB, B = 90°



[$\because$ A tangent is perpendicular to radius]

$\therefore$ $OB^2 = OP^2 - PB^2$

= 676 cm^2 – 576 cm^2

= 100 cm^2

$OB = \sqrt{100\ cm^2} = 10$ cm

In ΔBOC, OC = 8 cm [given] and $\angle C = 90°$

$\therefore$ $BC^2 = OB^2 - OC^2$

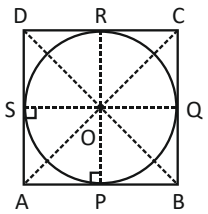
= $(10\ cm)^2 - (8\ cm)^2$

= 36 cm^2

BC = $\sqrt{36\ cm^2} = 6$ cm

$\therefore$ AC = 2 × BC = 12 cm.

20. (C) Const: Join OA, OB, OC, OD, OP, OQ, OR, and OS



$\therefore \angle AOP = \angle AOS = x$ [$\because$ CPCT]

$\Delta AOP \cong \Delta AOS$ [$\because$ RHS congruency]

Similarly $\angle POB = \angle BOQ = y$

$\angle QOC = \angle COR = l$

$\angle ROD = \angle DOS = m$

But $\angle AOP + \angle POB + \angle BOQ + \angle QOC + \angle COR + \angle ROD + \angle DOS = 360°$

$\therefore x + y + y + l + l + m + n + x = 360°$

$x + y + l + m = 180°$

$x + m + y + l = 180°$

$\Rightarrow \angle AOS + \angle SOD + \angle BOQ + \angle QOC = 180°$

$\Rightarrow \angle AOD + \angle BOC = 180°$

21. (D) Given $\alpha+\beta=\frac{-b}{a}=\frac{-11}{3}$

$\alpha\beta=\frac{c}{a}=\frac{-4}{3}$

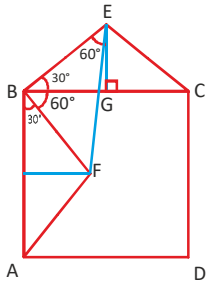
$\therefore \frac{\alpha}{\beta}+\frac{\beta}{\alpha}=\frac{\alpha^2+\beta^2}{\alpha\beta}$

$\frac{\alpha}{\beta}+\frac{\beta}{\alpha}=\frac{(\alpha+\beta)^2-2\alpha\beta}{\alpha\beta}=\frac{\left(\frac{-11}{3}\right)^2-2\left(\frac{-4}{3}\right)}{\frac{-4}{3}}$

$=\frac{\frac{121}{9}+\frac{8}{3}}{\frac{-4}{3}}=\frac{145}{\cancel{9}_3}\times\frac{-\cancel{3}}{4}$

$=\frac{-145}{12}$

22. (D) Const: Draw EG BC



Construction = EG ⊥ BC and Join EF

In ΔBEG, $\angle BEG = \frac{120°}{2} = 60°$

In ΔBEG, 90° + 60° + ∠EBG = 180°

$\therefore$ ∠EBG = 180° – 150° = 30°

$\therefore$ ∠FBA = 30° [$\because$ ΔFBA ≅ ΔECB]

$\therefore$ ∠FBG = 90° – 30° = 60°

$\therefore$ ∠FBE = 60° + 30° = 90°

In ΔEFB, ∠FBE = 90° & BE = BF

$\therefore$ $\sqrt{2}$ BE = EF = 16 cm

BE = $\frac{16\text{cm}}{\sqrt{2}}\times\frac{\sqrt{2}}{\sqrt{2}}=8\sqrt{2}$ cm

In ΔBEG, ∠G = 90° & ∠BEG = 60°

$\therefore$ $\sin 60° = \frac{BG}{BE}$

$\frac{\sqrt{3}}{2}=\frac{BG}{8\sqrt{2}\text{ cm}}$

BG = $4\sqrt{6}$ cm

BC = 2 × $\overline{BG}$ = $8\sqrt{6}$ cm

Perimeter of square = 4 × $\overline{BC}$

= $32\sqrt{6}$ cm

23. (D) Let speed of the sailer in still water be x kmph and speed of the stream be y kmph

$\frac{8h}{x+y}$ = 40 min = $\frac{2}{3}$ hour

$\therefore$ $x+y=\frac{24}{2}=12 \longrightarrow$ ①

Given $\frac{8h}{x-y}$ = 1 hour

$\therefore$ $x-y=8 \longrightarrow$ ②

Eq. ① + ② $\Rightarrow x+\cancel{y}+x-\cancel{y}=12+8$

$2x$ = 20

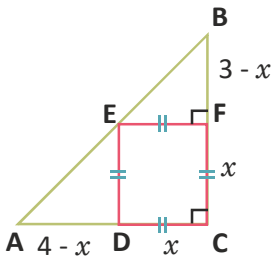
x = 10 kmph

24. (C) $\frac{1}{p}+\frac{1}{q}+\frac{1}{r}=\frac{pq+qr+rp}{pqr}$

$=\frac{\left(\frac{c}{\cancel{a}}\right)}{\left(\frac{-d}{\cancel{a}}\right)}$

$=\frac{-c}{d}$

25. (A)



Let CF be x cm

$\Rightarrow$ BF = $(3-x)$ cm & AD = $(4-x)$ cm

$\Delta BEF \sim \Delta BAC$ [$\because$ A A similarity)

$\therefore \quad \frac{EF}{AC} = \frac{BF}{BC}$

$\Rightarrow \quad \frac{x}{4} = \frac{3-x}{3}$

$3x = 12 - 4x$

$7x = 12$

$x = \frac{12}{7}$ cm

PHYSICS

26. (C) Slope of V–I graph (V/I) for T_2 is higher than that for T_1. So, resistance (=V/I) is higher for T_2 than that for T_1. As resistance for a metal increases with temperature, $T_1 < T_2$ or $T_2 > T_1$

27. (A) Convex lens has positive power and positive focal length.

$P = \frac{1}{f} \quad \therefore f = \frac{1}{P} = \frac{1}{4} = 0.25$ m

28. (C) Electricity in domestic circuits passes from main fuse box to electric meter and next to main switch.

29. (C) $A = 60°, \quad \mu = \sqrt{3}, \quad , \quad \delta = ?$

As, $\mu = \frac{\sin\frac{A+\delta_m}{2}}{\sin\frac{A}{2}}$

Or, $\frac{\sin(A+\delta_m)}{2} = \mu \sin\frac{A}{2}$

$\frac{\sin(A+\delta_m)}{2} = \sqrt{3}\sin 30°$

$\frac{\sin(A+\delta_m)}{2} = \sqrt{3} \times \frac{1}{2}$

$\frac{A+\delta_m}{2} = \sin 60°$

So, $\delta_m = 120° - A - 60° = 60°$

30. (A) When a tubelight that draws 10 W when connected to a 12 V supply is connected to a 6 V supply, its resistance will remain the same.

31. (C) As per the given figure

ni sin i = nr sin r, (1) sin (i) 60° = (1.5) sin (r)

$= 1 \times \frac{\sqrt{3}}{2} = 1.5 \times \sin(r)$,

sin r = 0.577 , r = 35.3°

32. (A) A magnetic field is produced when the current is passing through a long straight wire. The strength of the magnetic field increases, if the magnitude of the current increases.

33. (B) In the case of myopic defeet, the object's image is formed in front of the retina instead of falling on the retina. To correct this defect, a concave lens of suitable power is fixed in the spectacles. The parallel rays coming from the distant object (at infinity) are first diverged by the concave lens forming a virtual image. As the rays of light appear to be coming from the eye's far point (F), they can be easily focussed by the eye-lens to form an image on the retina.

34. (B) To get an image larger than the object i.e., a magnified image, one can use a concave mirror because it forms magnified, real or virtual images.

(a) a convex mirror always forms virtual and diminished images.

(b) a plane mirror always forms virtual and same sized images.

35. (B) Diameter of the wire (d) = 1 mm = 1×10^{-3}m,

Radius of the wire (r) = $10^{-3/2}$ m,

Length of wire (l) = 2 m and Resistance of a metal wire (R) = 40 Ω

$$\Rightarrow \rho = \frac{RA}{l} = \frac{R \times \pi r^2}{l}$$

$$\Rightarrow \rho = \frac{40 \times 3.14 \times 10^{-6}}{2 \times 4} = 15.7 \times 10^{-6}\,\Omega m$$

CHEMISTRY

36. (B) In the given reactions, metal oxides are reduced to metal.

37. (D) Both the reactions (ii) and (iii) are the examples of combination reactions. Chemical reactions given in (i) is of Decomposition whereas in (iv) it is a Redox reaction.

38. (C) Ethene and propene are unsaturated hydrocarbons that undergo addition reactions with bromine to form colourless dibromoethane and dibromopropane respectively.

39. (B) In both the cases, precipitation occurs. A white precipitate of BaSO4 is formed as shown below.

(i) $Ba(OH)_2 + H_2SO_4 \rightarrow BaSO_4 + 2H_2O$

(ii) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$

40. (C) Concentration of bauxite ore is by chemical separation. By adding NaOH to the ore, Al_2O_3 reacts with NaOH to form sodium aluminate due to amphoteric nature of Al_2O_3.

41. (D) Metal M (an element) reacts with oxygen (an element) to form a single compound $2M_2O_3$. So, it is a combination reaction of two elements, a metal and a non-metal. Oxygen is added to metal M to form a compound $2M_2O_3$. As oxygen is added to metal M it is an oxidation reaction.

42. (C) The given chemical reaction is used in the manufacture/preparation of soap.

Vegetable oil (Castor, cotton, linseed or soyabean oil) + Alkali (Sodium hydroxide) $\xrightarrow{\Delta}$ Soap (Sodium salt of fatty acid) + Glycerol (P) (An alcohol)

So, 'P' is glycerol.

43. (B) Statements (ii) and (iii) are correct.

44. (C) Statements (i) and (iv) are correct about the given activity.

Beaker P	Beaker Q	Beaker R
25 mL of water + Small amount of NaOH ⟶ Temperature increased	25 mL of water + Small amount of $CuSO_4$ ⟶ Temperature increased	25 mL of water + Small amount of $NaCl$ ⟶ Temperature decreased

Thus, we can conclude that there is an increase in the temperature in beakers P and Q. So, exothermic process has occurred. In beaker R, there is a decrease in the temperature. So, endothermic process has occurred.

45. (D) Thermite welding is done to join the broken pieces of girders, railway tracks and cracked machine parts.

BIOLOGY

46. (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.

47. (A) Substance P is referred to water. During transpiration water is passed out through stomata of leaves.

48. (C) The process which a cell uses its plasma membrane to engulf a large particle giving rise to an internal compartment called the phagosome. This process is called phagocytosis.

49. (A) The plant produce more oxygen when there is more carbon dioxide concentration in water in bright light with warm temperature.

50. (C) Pulmonary vein carries oxygenated blood from lungs.

51. (B) Amniotic fluid acts as a shock absorber and helps to protect the foetus from mechanical injury.

52. (D) The breakdown of proteins

1. Occurs in the stomach due to the action of pepsin. It is a form of chemical digestion.

2. The churning action of the stomach helps to break the foood into smaller pieces. This is a form of physical digestion.

3. The hydrochloric acid produced helps to kill any micro-organisms that may have been ingested.

4. It also provides a suitable pH for the action of pepsin and rennin.

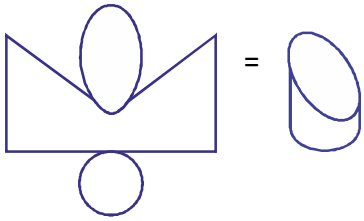
53. (C) He can use the Benedict's test to test for the presence of reducing sugars, and the iodine test to test for the presence of starch. The Biuret test is used to indicate the presence of proteins while the ethanol-emulsion test is used to indicate the presence of fats.

54. (B) In aerobic respiration, glucose is broken down in the presence of oxygen to produce carbon dioxide and water. A large amount of energy is released in the process.

55. (D) The pollen tube grows from the pollen grain, secreting enzymes that digest through the tissue of the stigma, followed by the tissue of the style, and finally the ovary wall to reach the ovule(S).

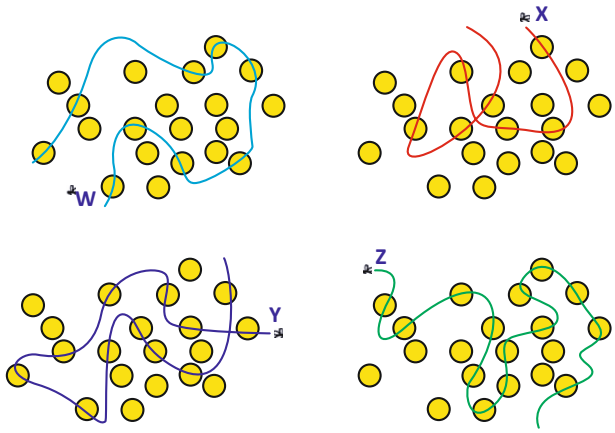
CRITICAL THINKING

56. (A) It seems quite evident that the parents have instructed their wards to abstain from private tuitions on Sundays and attend special classes organised by the school.

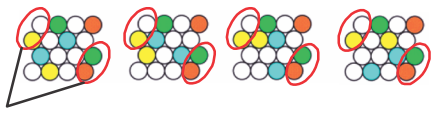
57. (B) 

58. (D) When bulb-R shown in given diagram is blown off then all four bulbs will get disconnected from the battery because they are connected in series. So, all the bulbs P, Q, R and S will not glow.

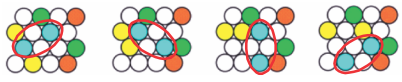
59. (B) W = 9 ; X = 7 ; Y = 12 ; Z = 14



60. (B)



These two repeated in the pattern



This is repeated in the pattern