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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION (UPDATED)

CLASS - 10

Question Paper Code : UN499

KEY

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

SOLUTIONS

MATHEMATICS

1. (B) $\angle ACB \sim \Delta ADC$ [$\because$ A.A. similarly]

$$\frac{AC}{AD} = \frac{BC}{DC} = \frac{AB}{AC}$$

$$\frac{\sqrt{52}}{4} = \frac{BC}{6} = \frac{AB}{\sqrt{52}} \quad [\because \quad AC^2 - 4^2 + 6^2]$$

$$4AB = \sqrt{52} \times \sqrt{2}$$

$$AB = \frac{52}{4} = 13$$

$$\text{Area of } \Delta ABC = \frac{1}{2} \times AB \times CD$$

$$= \frac{1}{\cancel{2}} \times 13 \times \cancel{6}^{3} \text{ units}^2$$

$$= 39 \text{ square units}$$

02. (B) $AC^2 = AB^2 + BC^2$

$\therefore$ AC = 10 cm

$$S = \frac{a+b+c}{2} = \frac{24\,cm}{2} = 12\ cm$$

$\frac{1}{2} \times 6 \text{ cm} \times 8 \text{ cm} = rs$

$\frac{24 \text{ cm}^2}{12 \text{ cm}} = r$

$r = 2$ cm

$= \frac{1}{2} \times 6 \times 8 \text{cm}^2 - \frac{22}{7} \times 2 \times 2 \text{ cm}^2$

$= 24 \text{ cm}^2 - 12.57 \text{ cm}^2$

$= 11.43 \text{ cm}^2$

03. (A) Let $a_1, a_2, a_3 \ldots a_n$ are the Am's between a & b

$\therefore$ a, $a_1, a_2, a_3 \ldots a_n$, b are in Ar

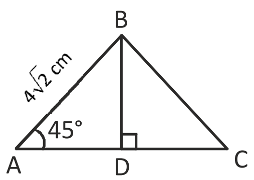
$\therefore a_1 = a + d$ $\qquad a_n = b - d$

Sum of 'n' Am's $= a_1 + a_2 + a_3 + \ldots + a_n$

$= \frac{n}{2}(a_1 + a_n) = \frac{n}{2}[a + d + b - d]$

$= \frac{n}{2}[a + b]$

04. (B) Const:- BD $\perp$ AC



In ΔABD $\sin 45° = \frac{BD}{AB}$

$\frac{1}{\sqrt{2}} = \frac{BD}{4\sqrt{2} \text{ cm}}$

BD = 4 cm

Area of $\Delta ABC = \frac{1}{2} \times BD \times AC$

$= \frac{1}{2} \times 4 \text{ cm} \times 7 \text{ cm} = 14 \text{ cm}^2$

05. (D) $3748x + 5467y = 10085$

$1731x + 7484y = 4034$
(–) (–) (–)

$2017x - 2017y = 6051$

$2017(x - y) = 6051$

$x - y = \frac{6051}{2017} = 3$

06. (C) If $\cos\theta = \frac{1}{2}$ then $\sec\theta = 2$

$\Rightarrow \sec\theta + \cos\theta = 2 + \frac{1}{2} = \frac{5}{2}$

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

$\therefore \sin^2\theta = \sin^2 60° = \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{3}{4}$

(or)

Given $\frac{1}{\cos\theta} + \cos\theta = \frac{5}{2}$

$\Rightarrow \frac{1 + \cos^2\theta}{\cos\theta} = \frac{5}{2}$

$\Rightarrow 2\cos^2\theta - 5\cos\theta + 2 = 0$

$\Rightarrow 2\cos^2\theta - 4\cos\theta - \cos\theta + 2 = 0$

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

$\therefore \cos\theta = 2$ (or) $\cos\theta = \frac{1}{2}$

But $\cos\theta$ never be greater than 1

$\therefore \cos\theta = 2$ is refected

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

$\therefore \theta = 60°$

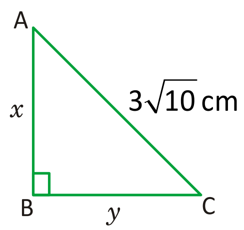
$\sin^2\theta = (\sin 60°)^2$

$= \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{3}{4}$

07. (D) Given in ΔABC

$\angle B = 90°$ & $AC = 3\sqrt{10}$ cm

Let AB = x & BC = y



$\therefore x^2 + y^2 = \left(3\sqrt{10}\right)^2 = 90 \rightarrow (1)$

Given $(3x)^2 + (2y)^2 = (9\sqrt{5})^2$

$\Rightarrow 9x^2 + 4y^2 = 405 \quad \rightarrow \quad (2)$

eq (2) – eq (1) × 4 $\Rightarrow (9x^2 + 4y^2) - (4x^2 + 4y^2) = 405 - 4 \times 90$

$5x^2 = 45$

$$x^2 = \frac{45}{5} = 9$$

$$x = \sqrt{9} = 3$$

$9 + y^2 = 90 \quad \rightarrow \quad (1)$

$y^2 = 90 - 9 = 81$

$$y = \sqrt{81} = 9$$

$x + y = 3 + 9 = 12$ cm

08. (A) Given $S_n = (3n^2 + 5n)$

∴ $S_{n-1} = 3(n-1)^2 + 5(n-1) = 3(n^2 - 2n + 1) + 5n - 5$

$= 3n^2 - 6n + 3 + 5n - 5$

$s_{n-1} = 3n^2 - n - 2$

∴ $a_n = s_n - s_{(n-1)} = (3n^2 + 5n) - (3n^2 - n - 2)$

$$= \cancel{3n^2} + 5n - \cancel{3n^2} + n + 2$$

$= 6n + 2$

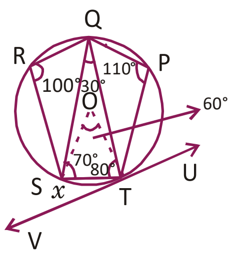
Given $a_n = 152$

∴ $6n + 2 = 152$

$6n = 152 - 2 = 150$

$$n = \frac{150}{6} = 25$$

09. (D) Construction: - Join SQ. Join OS, OT.



QRST is a cycle quadrilateral

∴ ∠STQ = 180° – ∠R = 80°

QSTP is a cyclic quadrilateral

∴ ∠QST = 180° – 110° = 70°

In ΔQST, 70° + 80° + ∠SQT = 180°

∠SQT = 30°

∴ ∠SOT = 2 ∠SQT = 60°

In ΔSOT, ∠SOT = 60° & OS = OT

$\Rightarrow$ ∠OTS = 60°

But ∠OTV = 90°

[∵ A tangent is perpendicular to radius]

∴ 60° + x = 90°

x = 90° – 60° = 30°

10. (B) Given

(secA – tanA)(secB + tanB)(secC – tanC)

= (secA + tanA)(secB – tanB)(secC + tanC)

Multiplify

(secA + tanA)(secB – tanB)(secC + tanC) on both sides

∴ $(\sec A + \tan A)^2(\sec B - \tan B)^2(\sec C + \tan C)^2$

$= (\sec^2 A - \tan^2 A)(\sec^2 B - \tan^2 B)(\sec^2 C - \tan^2 C)$

= 1

∴ (secA + tanA)(secB – tanB)(secC + tanC)

$= \pm\sqrt{1} \quad = \pm 1$

11. (C) Given

$$\sqrt{(a+b-x)^2 + (b-a-y)^2} = \sqrt{(a-b-x)^2 + (a+b-y)^2}$$

Squaring on both sides

$$\cancel{a^2} + \cancel{b^2} + \cancel{x^2} + \cancel{2ab} - 2bx - \cancel{2ax} + \cancel{b^2} + \cancel{a^2} + \cancel{y^2} - \cancel{2ab} + 2ay - \cancel{2yb}$$

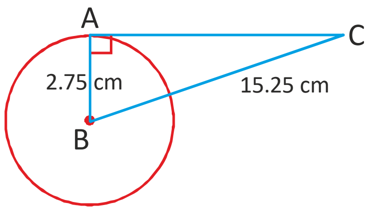
$$= \cancel{a^2} + \cancel{b^2} + \cancel{x^2} - 2ab + 2bx - 2ax + \cancel{a^2} + \cancel{b^2} + \cancel{y^2} + 2ab - 2by - 2ay$$

$2ay + 2ay = 2bx + 2bx$

$4ay = 4bx$

∴ $bx = ay$

12. (C)



In ΔABC, $\angle BAC = 90°$

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

$AC^2 = \sqrt{BC^2 - AB^2}$

$= \sqrt{(15.25)^2 - (2.75)^2}$

$= \sqrt{232.5625 - 7.5625}$

$= \sqrt{225}$ cm $= 15$ cm

13. (A) $\text{LHS} = \frac{\sqrt{a_1}-\sqrt{a_2}}{a_1 - a_2} + \frac{\sqrt{a_2}-\sqrt{a_3}}{a_2 - a_3}$

$+ \frac{\sqrt{a_3}-\sqrt{a_4}}{a_3 - a_4} + \ldots\ldots\ldots + \frac{\sqrt{a_{n-1}}-\sqrt{a_n}}{a_{n+} - a_n}$

$= \frac{\sqrt{a_1}-\sqrt{a_2}}{-d} + \frac{\sqrt{a_2}-\sqrt{a_3}}{-d}$

$+ \frac{\sqrt{a_3}-\sqrt{a_4}}{-d} + \ldots\ldots\ldots + \frac{\sqrt{a_{n-1}}-\sqrt{a_n}}{-d}$

$= \frac{\sqrt{a_1} - \cancel{\sqrt{a_2}} - \cancel{\sqrt{a_2}} - \cancel{\sqrt{a_3}} + \cancel{\sqrt{a_3}} - \cancel{\sqrt{a_4}} + \ldots.. + \cancel{\sqrt{a_{n-1}}} - \sqrt{a_n}}{(-d)}$

$= \frac{\sqrt{a_1}-\sqrt{a_n}}{(-d)} \times \frac{\sqrt{a_1}+\sqrt{a_n}}{\sqrt{a_1}+\sqrt{a_n}}$

$= \frac{a_1 - a_n}{-d\,(\sqrt{a_1}+\sqrt{a_n})}$

$= \frac{a_n - a_1}{d\,(\sqrt{a_1}+\sqrt{a_n})}$

$= \frac{\cancel{a} + (n-1) - \cancel{a}}{d\,(\sqrt{a_1}+\sqrt{a_n})}$

$= \frac{(n-1)\cancel{d}}{\cancel{d}(\sqrt{a_1}+\sqrt{a_n})}$

14. (D) $p = \sqrt{\frac{1-\sin x}{1+\sin x} \times \frac{1-\sin x}{1-\sin x}}$

$= \sqrt{\frac{(1-\sin x)^2}{1-\sin^2 x}}$

$= \sqrt{\frac{(1-\sin x)^2}{\cos^2 x}}$

$= \sqrt{\left(\frac{1-\sin x}{\cos x}\right)^2}$

$p = \frac{1-\sin x}{\cos x} = q$ and

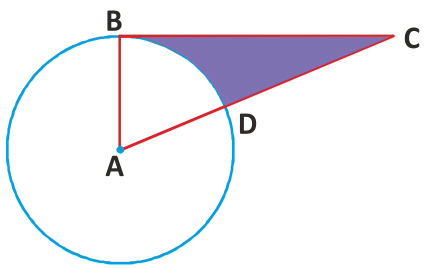
$\frac{1-\sin x}{\cos x} = \frac{(1-\sin x)\cos x}{\cos^2 x}$

$= \frac{(1-\sin x)(\cos x)}{(1-\sin^2 x)}$

$= \frac{\cancel{(1-\sin x)}(\cos x)}{\cancel{(1-\sin x)}(1+\sin x)} = r$

$\therefore$ $p = q = r$

15. (A)



Given $\angle ACB = 30°$ and $\angle ABC = 90°$

$\tan C = \frac{AB}{BC}$

$\tan 30° = \frac{AB}{6\,\text{cm}}$

$AB = \frac{6\text{ cm}}{\sqrt{3}} = 2\sqrt{3}\,\text{cm}$

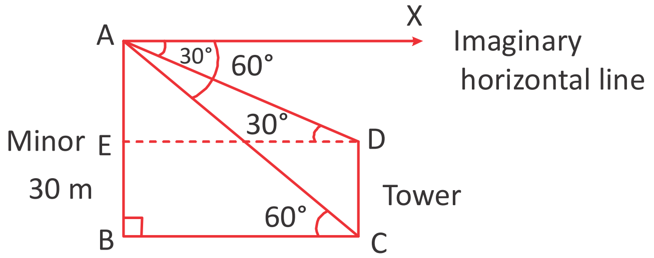
Area of the shaded region = Area of ΔABC – Area of the sector ABD

$= \frac{1}{\cancel{2}} = \cancel{2}\sqrt{3} \times 6cm^2 - \frac{1}{6} \times \pi \times \left(2\sqrt{3}\right)^2$

$= (6\sqrt{3} - 2\pi)\ cm^2$

16. (B) Given $\angle XAD = 30° \Rightarrow \angle ADE = 30°$

[$\because$ Alternative angles]



$\angle XAC = \angle ACB = 60°$

[$\because$ Alternative angles]

In Δ ABC, $\angle B = 90°$ & $\angle ACB = 60°$

$\Rightarrow \tan 60° = \frac{AB}{BC}$

$\sqrt{3} = \frac{30\text{ m}}{BC}$

$BC = \frac{30\text{ m}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$BC = 10\sqrt{3}$ metres

In ΔADE $\tan 60° = \frac{AE}{ED}$

$\frac{1}{\sqrt{3}} = \frac{AE}{10\sqrt{3}}$

$AE = \frac{10\sqrt{3}}{\sqrt{3}}$

$\therefore$ CD = BE = 30 – 10 = 20 cm

17. (B) $6x^2 + 17x + 12 = 6x^2 + 8x + 9x + 12$

$= 2x(3x + 4) + 3(3x + 4)$

$= (3x + 4)(2x + 3)$

$12x^2 + 7x - 12 = 12x^2 + 16x - 9x - 12$

$= 4x(3x + 4) - 3(3x + 4)$

$= (3x + 4)(4x - 3)$

HCF of $(6x^2 + 17x + 12)$ and

$(12x^2 + 7x - 12) = (3x + 4)$

18. (B) Given area of $(\Delta ABC) = 16 \times$ area of ΔPQR

$\Rightarrow \frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{16}{1}$

$\Rightarrow \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2} = \frac{16}{1}$

$\Rightarrow \frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR} = \sqrt{\frac{16}{1}} = \frac{4}{1}$

$\therefore$ Perimeters ratio of DABC and DPQR = (AB + BC + CD) = (PQ + QR + RP)

= 12 : 3

= 4 : 1

19. (D) Given PQRS is a rectangle

$\Rightarrow$ Mid point of PR = Mid point of QS

$\therefore \left(\frac{9+m}{2}, \frac{2+13}{2}\right) = \left(\frac{15+5}{2}, \frac{5+n}{2}\right)$

$\therefore$ m = 11 & n = 10

m – n = 1

20. (D) $2 + 8 = -a \Rightarrow a = -10$

$3 \times 3 = b \Rightarrow b = 9$

$\therefore x^2 - 10x + 9 = 0$

$x = 9$ (or) 1

21. (B) $\alpha + \beta + \gamma = -\frac{b}{a} = -(-17) = 17 = -3+9+11$

$\alpha\beta + \beta\gamma + \gamma\alpha = 39$

$= -3 \times 9 + 9 \times 11 + (-3)(11) = 39$

$\alpha + \gamma = -\frac{d}{a} = -297 = (-3)(9)(11)$

$\therefore$ –3, 9, 11 are the zeros

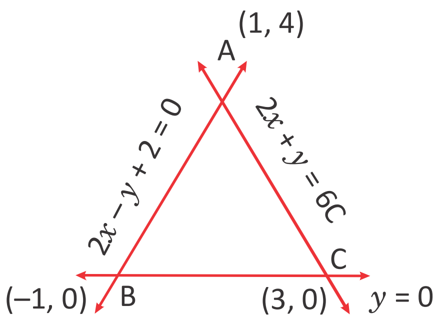
22. (B) $G = \left(\frac{2 \times 5 + 2}{3}, \frac{2 \times 0 + 3}{3}\right)$

= (4, 1)

23. (D) $2x + y = 6$ & $y = 0$ lines intersect at (3, 0)

$2x - y + 2 = 0$ & $y = 0$ lines intersect at (–1, 0)

$2x + y = 6$ and $2x - y = -2$ lines intersect at (1, 4)



A(1, 4) B(–1, 0) C(3, 0)

Area of the ΔABC

$$= \frac{1}{2}\left|1(0-0)-1(0-4)+3(4-0)\right|$$

$$= \frac{1}{2}\left|4+12\right|$$

= 8 sq units

24. (A) Breadth = radius = $\frac{14 \text{ cm}}{2}$ = 7 cm

Area of ΔABD = $\frac{1}{2}$ × 7 cm × 14 cm = 49 cm^2

Area of unshaded part of ΔABD

$$= \frac{1}{2} \times 7 \times 7 \text{ cm}^2 - \frac{45°}{360°} \times \frac{22}{7} \times 7 \times 7 \text{ cm}^2$$

= 24.5 cm^2 – 19.25 cm^2

= 5.25 cm^2

Area of shaded region = Area of ΔABD – Area of unshaded part of ΔABD

= 49 cm^2 – 5.25 cm^2

= 43.75 cm^2

25. (C) Let $\sqrt{\frac{3}{x}}$ be 'a'

Given $5a + \frac{7}{a} = \frac{68}{3}$

$5a^2 + 7 = \frac{68a}{3}$

$15a^2 - 68a + 21 = 0$

$15a^2 - 63a - 5a + 21 = 0$

$3a(5a - 21) - 1(5a - 21) = 0$

$a = \frac{1}{3}$ or $a = \frac{21}{5}$

$\therefore \sqrt{\frac{3}{x}} = \frac{1}{3}$

$\frac{3}{x} = \frac{1}{9}$

$x = 27$

$\sqrt{\frac{3}{x}} = \frac{21}{5}$

$\frac{3}{x} = \frac{441}{25}$

$x = \frac{25}{147}$

PHYSICS

26. (C) The voltmeter must be connected in parallel with the resistor while the ammeter must be connected in series.

27. (D) Refracting index of a medium is the ratio between the speed of light in air or vacuum and the speed of light in a medium.

28. (B) As $f = \frac{1}{P}$

$\therefore f = \frac{1}{-4.5} = -22.2$ cm

29. (A) The reflected ray follows the laws of the reflection. The refracted ray bends away from normal because light is travelling from optically denser (glass) to optically less dense medium (air).

30. (A) An ideal electromagnet has very strong magnetic strength when it is in operation and zero magnetic strength when the flow of electric current is switched off. To achieve that, the core of the electromagnet must not retain any magnetism when it is taken out from the coil.

31. (B) $\frac{1}{F}=\frac{1}{f_1}+\frac{1}{f_2}=\frac{1}{40}-\frac{1}{25}=\frac{5-8}{200}=-\frac{3}{200}$

$$P=\frac{100}{F}=\frac{-3}{2}=-1.5\text{ D}$$

32. (B) Refractive index of glass

$$=\frac{\sin i}{\sin r}=\frac{\frac{0.438}{0.267}+\frac{0.629}{0.383}}{2}=1.64$$

33. (A) The magnitude of the force experienced by a current-carrying conductor when placed in a magnetic field will be maximum if the directions of current and magnetic field are perpendicular to each other.

34. (A) Here u = –25 cm, v = –100 cm, f = ?

$$\frac{1}{f}=\frac{1}{v}-\frac{1}{u}=\frac{1}{-100}+\frac{1}{25}=\frac{3}{100}$$

$$f=\frac{100}{3}\text{ cm}$$

$$P=\frac{100}{f}=\frac{100}{\frac{100}{3}}=3\text{ D}$$

35. (C) The resistance of a wire is proportional to its length. Hence, the 2.0 m wire has a resistance of 2(2.0) = 4.0 Ω. Using Ohm's law, the new current is halved, i.e. 1.5 A,

CHEMISTRY

36. (B) Following are the colours of the given non-metals:

Chlorine – Greenish yellow

Bromine – Reddish Brown

Iodine – Purple

Nitrogen – Colourless

37. (D) We can balance a chemical equation by adjusting the coefficients in front of the chemical formulae.

38. (A) Hydrogen is used to convert unsaturated compounds into saturated compounds.

39. (D) 20 cm^3 of dil. HCl when added to 10 cm^3 of dil. HCl will not change its pH.

40. (D) Metal gold is used in making jewellery as it has high malleability, highly lustrous in nature and non-reactive towards atmospheric gases and chemicals.

41. (B) An acidic gas turns universal indicator paper red and oxygen gas relights a glowing splinter.

42. (Delete)

43. (C) According to the International Union of Pure and Applied Chemistry (IUPAC), alcohols are named by changing the ending of the parent alkane name to -ol. Here are some basic IUPAC rules for naming alcohols :

1. The longest continuous chain (LCC) of carbon atoms containing the OH group is taken as the parent compound —an alkane with the same number of carbon atoms. The chain is numbered from the end nearest the OH group.

2. The number that indicates the position of the OH group is prefixed to the name of the parent hydrocarbon, and the -e ending of the parent alkane is replaced by the suffix -ol. Substituents are named and numbered as in alkanes.

In the given question :

Four carbon atoms in the LCC makes the compound a derivative of butane (rule 1), and the OH on the second carbon atom makes it a 2-butane (rule 2).

$$\begin{array}{ccccccc} \mathit{4} & & \mathit{3} & & \mathit{2} & & \mathit{1} \\ CH_3 & - & CH & - & CH & - & CH_3 \\ & & | & & | & & \\ & & CH_3 & & CH & & \end{array}$$

The carbon atoms are numbered from the end closest to the OH group. That fixes the methyl (CH3) group at the third position. The name is 3-methyl-2-butane.

Option (C) is the correct answer.

44. (D) Sodium carbonate on reaction with dilute nitric acid produces CO_2 gas. This gas dissolves in water to produce carbonic acid whose pH is less than 7.

45. (C) The oxides formed by non-metals are acidic and neutral in nature. Among the given options only nitric oxide and carbon dioxide are non-metallic oxides. Nitric oxide is neutral whereas carbon dioxide is acidic in nature. Potassium oxide being a metallic oxide is basic in nature.

BIOLOGY

46. (D) The process of photosynthesis takes place in two phases-photochemical phase and biosynthetic phase. Photochemical phase involves absorption of light energy, photolysis of water with the release of O, and production of assimilatory power (ATP+NADPH). CO_2 fixation occurs during biosynthetic phase of photosynthesis.

47. (D) The left ventricle possesses a thicker wall than the right ventricle because it pumps the oxygenated blood at a higher pressure to all areas of the body while the right ventricle only has to pump blood to the lungs which is a much shorter distance, therefore less pressure is required.

48. (B) The option (B), i.e., Medulla oblongata – Temperature regulation is incorrectly matched as the function of temperature regulation is performed by hypothalamus.Medulla oblongata controls blood pressure,heart beat ect.

49. (B) The hormones secreted by the human placenta are estrogen, progesterone and human chorionic gonadotropin.

50. (C) The dominant traits studied by Mendel are violet flower colour, green pod colour and round seed shape.

51. (A) The correct matching is :

P-(iii),Q-(i),R-(iv),S-(ii)

Lungs: Removes large amount of CO_2.

Liver: Removes bilirubin, bilivirdin, cholesterol, degraded steroids, hormones, vitamins, and drugs.

Skin: Sweat glands help in removal of sweat containing NaCl, small amount of urea, lactic acid, etc. Sebaceous glands helps in removal of sterols, hydrocarbons and waxes through sebum.

Kidneys: The kidneys filter out the waste products and excess fluids from the body and dispose them in the form of urine, via the bladder.

52. (D) Human beings have one pair of sex chromosomes (XX in females; XY in males).

53. (A) The first link in any food chain is green plants because only they have the capacity to trap sunlight and synthesise food.

54. (B) The electrons released are used for photophosphorylation. Oxygen released during photosynthesis comes from water and not from CO_2. ATP and NADPH molecules produced during light reaction are utilized to convert CO_2 into carbohydrates in the dark reaction.

The hydrogen ions are carried to NADPH which are used to reduce CO_2 in the dark reaction.

55. (D) The organism shows holozoic nutrition, as the organism feeds on complex organic matter by the process of ingestion which later gets digested and absorbed.

CRITICAL THINKING

56. (B) The answer is B. Since the combined weight of the two cars is twice as much as that of the single car, the distance of the left car from the fulcrum needs to be twice the distance as the cars on the right in order to balance.

57. (A) According to a statement (1), 5 percent of the people who own an automatic transmission vehicle also own a manual transmission vehicle. The question also indicates that 12 percent of the people who own a manual transmission vehicle also own an automatic transmission vehicle. Both figures relate to the total number who own both, so that means that 5 percent of the automatic transmission owners = 12 percent of the manual transmission owners. The overlap in ownership makes up a smaller percentage of those who own automatic transmission vehicles, so there must be more people who own automatic transmission vehicles. Statement (1) is sufficient, so you can eliminate choices (B), (C)

Statement (2) indicates that 15 people own both an automatic transmission vehicle and a manual transmission vehicle, so you know that 12 percent of the people who own a manual transmission is equal to 15 people. 12 / 100 = 15, so x = 125. Thus, 125 people own a manual transmission vehicle. However, you have no further information to allow you to calculate the number of people who own automatic transmission vehicles, so statement (2) is insufficient.

58. (B) fig. (X), one of the dots lies in the region common to the circle and the triangle only, another dot lies in the region common to the circle, the square and the triangle only and the third dot lies in the region common to the circle, the square and the rectangle only. In each of the figures (1) and (3) there is no region common to the circle and the triangle only. In fig. (4) there is no region common to the circle, the square and the rectangle only. Only fig. (2) consists of all the three types of regions.

59. (A) Purple is combination of blue and red together

Green is combination of blue and yellow

60. (D) According to the statement, 80% of the total runs were made by spinners. So, I does not follow. Nothing about the opening batsmen is mentioned in the statement. So, II also does not follow.