

MATHS PAGE 1 SCI PAGE 14
SST PAGE 70 ENG PAGE 90 HINDI PAGE 114

Test / Exam Name: Maths Mcqs Pyqs

- Q1.** The pair of linear equations $y = 0$ and $y = -6$ has. 1 M
A A unique solution **B** No solution
C Infinitely many solutions **D** Only solution (0, 0)
- Q2.** If $\triangle ABC \sim \triangle DEF$ such that $AB = 1.2\text{cm}$ and $DE = 1.4\text{cm}$, the ratio of the areas of $\triangle ABC$ and $\triangle DEF$ is: 1 M
A 49 : 36 **B** 6 : 7 **C** 7 : 6 **D** 36 : 49
- Q3.** If k , $2k - 1$ and $2k + 1$ are three consecutive terms of an A.P., the value of k is: 1 M
A 2 **B** 3 **C** -3 **D** 5
- Q4.** If the coordinates of one end of a diameter of a circle are (2, 3) and the coordinates of its centre are (-2, 5), then the coordinates of the other end of the diameter are: 1 M
A (-6, 7) **B** (6, -7) **C** (6, 7) **D** (-6, -7)
- Q5.** The number of solid spheres, each of diameter 6cm that can be made by melting a solid metal cylinder of height 45 cm and diameter 4cm, is: 1 M
A 3 **B** 5 **C** 4 **D** 6
- Q6.** The sum of first 20 odd natural numbers is: 1 M
A 100 **B** 210 **C** 400 **D** 420
- Q7.** The graph of $y = p(x)$ is given in the adjoining figure. Zeroes of the polynomial $p(x)$ are: 1 M
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- A** -5, 7 **B** $\frac{-5}{2}, \frac{-7}{2}$
C -5, 0, 7 **D** -5, $\frac{-5}{2}, \frac{-7}{2}, 7$
- Q8.** If $P\left(\frac{a}{2}, 4\right)$ is the mid-point of the line-segment joining the point (-6, 5) and B(-2, 3), then the value of a is: 1 M
A -8 **B** 3 **C** -4 **D** 4
- Q9.** The quadratic equation $x^2 - 4x + k = 0$ has distinct real roots if: 1 M
A $k = 4$ **B** $k > 4$ **C** $k = 16$ **D** $k < 4$
- Q10.** The angle of depression of a car, standing on the ground, from the top of a 75 m high tower, is 30° . The distance of the car from the base of the tower (in m.) is: 1 M
A $25\sqrt{3}$ **B** $50\sqrt{3}$ **C** $75\sqrt{3}$ **D** 150
- Q11.** If the difference between the circumference and the radius of a circle is 37 cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is: 1 M
A 154 **B** 14 **C** 44 **D** 7

Q12. The exponent of 2 in the prime factorization of 144, is: 1 Mark

- A** 2 **B** 4 **C** 1 **D** 6

Q13. The value of p, for which the points A(3, 1), B(5, p) and C(7, -5) are collinear, is: 1 M

- A** -2 **B** 2 **C** -1 **D** 1

Q14. A sphere of diameter 18 cm is dropped into a cylindrical vessel of diameter 36 cm, partly filled with water. If the sphere is completely submerged, then the water level rises (in cm) by 1 M

- A** 3 **B** 4 **C** 5 **D** 6

Q15. In Figure 1, O is the centre of a circle, PQ is a chord and PT is the tangent at P. If $\angle POQ = 70^\circ$, then $\angle TPQ$ is equal to: 1 M

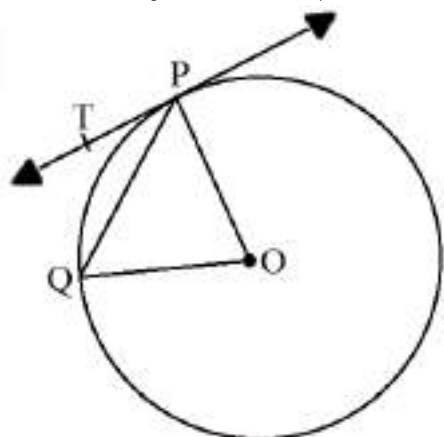
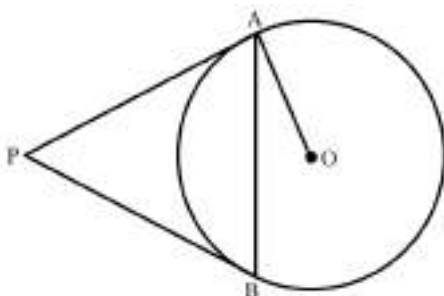


Figure 1

- A** 55° **B** 70° **C** 45° **D** 35°

Q16. In Fig. 2, PA and PB are tangents to the circle with centre O. If $\angle APB = 60^\circ$ then $\angle OAB$ is: 1 M



- A** 30° **B** 60° **C** 90° **D** 15°

Q17. Cards bearing numbers 2, 3, 4, ..., 11 are kept in a bag. A card is drawn at random from the bag. The probability of getting a card with a prime number is: 1 M

- A** $\frac{1}{2}$ **B** $\frac{2}{5}$ **C** $\frac{3}{10}$ **D** $\frac{5}{9}$

Q18. The point P which divides the line segment joining the points A(2, -5) and B(5, 2) in the ratio 2 : 3 lies in the quadrant: 1 M

- A** I **B** II **C** III **D** IV

Q19. The value of x for which 2x, (x + 10) and (3x + 2) are the three consecutive terms of an AP, is: 1 M

- A** 6 **B** -6 **C** 18 **D** -18

Q20. A card is drawn from a well-shuffled deck of 52 playing cards. The probability that the card will not be an ace is: 1 M

- A** $\frac{1}{13}$ **B** $\frac{1}{4}$ **C** $\frac{12}{13}$ **D** $\frac{3}{4}$

Q21. The radii of two circles are 4cm and 3cm respectively. The diameter of the circle having area equal to the sum of the areas of the two circles (in cm) is: 1 M

- A** 5 **B** 7 **C** 10 **D** 14

Q22. 1 Mark

One card is drawn at random from a well shuffled deck of 52 playing cards. The probability that it is a red ace card, is:

- A $\frac{1}{13}$ B $\frac{1}{26}$ C $\frac{1}{52}$ D $\frac{1}{2}$

- Q23.** The roots of the equation $x^2 - 3x - m(m + 3) = 0$, where m is a constant, are: 1 M
 A $m, m + 3$ B $-m, m + 3$ C $m, -(m + 3)$ D $-m, -(m + 3)$
- Q24.** The degree of polynomial having zeroes -3 and 4 only is: 1 M
 A 2 B 1 C More than 3 D 3
- Q25.** If $p - 1$, $p + 1$ and $2p + 3$ are in A.P., then the value of p is: 1 M
 A -2 B 4 C 0 D 2
- Q26.** The HCF of 135 and 225 is: 1 M
 A 15 B 75 C 45 D 5
- Q27.** n^{th} term of an A.P. is $7n + 4$. The common difference is: 1 M
 A $7n$ B 4 C 7 D 1
- Q28.** If the radius of the base of a right circular cylinder is halved, keeping the height the same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is: 1 M
 A $1 : 2$ B $2 : 1$ C $1 : 4$ D $4 : 1$
- Q29.** If one of the zeroes of the quadratic polynomial $x^2 + 3x + k$ is 2 , then the value of k is: 1 M
 A 10 B -10 C -7 D -2
- Q30.** In what ratio, does x -axis divide the line segment joining the points $A(3, 6)$ and $B(-12, -3)$? 1 M
 A $1 : 2$ B $1 : 4$ C $4 : 1$ D $2 : 1$
- Q31.** In Question an Assertion (A) statement is followed by a statement of Reason (R). Select the correct option out of the following: 1 M
Assertion (A): Point $P(0, 2)$ is the point of intersection of y -axis with the line $3x + 2y = 4$.
Reason (R): The distance of point $P(0, 2)$ from x -axis is 2 units.
 A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). B Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 C Assertion (A) is true but Reason (R) is false. D Assertion (A) is false but Reason (R) is true.
- Q32.** In Figure, from an external point P , two tangents PQ and PR are drawn to a circle of radius 4cm with centre O . If $\angle QPR = 90^\circ$, then length of PQ is: 1 M
 A 3cm B 4cm C 2cm D $2\sqrt{2}\text{cm}$
- Q33.** If the point $P(k, 0)$ divides the line segment joining the points $A(2, -2)$ and $B(-7, 4)$ in the ratio $1 : 2$, then the value of k is: 1 M
 A 1 B 2 C -2 D -1
- Q34.** The circumference of a circle is 22cm . The area of its quadrant (in cm^2) is: 1 M
 A $\frac{77}{2}$ B $\frac{77}{4}$ C $\frac{77}{8}$ D $\frac{77}{16}$
- Q35.** The n^{th} term of the A.P. $a, 3a, 5a, \dots$ is. 1 M
 A na B $(2n - 1)a$ C $(2n + 1)a$ D $2na$

- Q36.** The total number of factors of a prime number is: 1 Mark
A 1 **B** 0 **C** 2 **D** 3
- Q37.** If the roots of equation $ax^2 + bx + c = 0$, $a \neq 0$ are real and equal, then which of the following relation is true? 1 M
A $a = \frac{b^2}{c}$ **B** $b^2 = ac$
C $ac = \frac{b^2}{4}$ **D** $c = \frac{b^2}{a}$
- Q38.** The distance between the points $(m, -n)$ and $(-m, n)$ is: 1 M
A $\sqrt{m^2 + n^2}$ **B** $m + n$
C $2\sqrt{m^2 + n^2}$ **D** $\sqrt{2m^2 + n^2}$
- Q39.** The common difference of the A.P. $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$ is: 1 M
A 1 **B** $1p$ **C** -1 **D** $-1p$
- Q40.** The angle of depression of a car parked on the road from the top of a 150m high tower is 30° . The distance of the car from the tower (in metres) is: 1 M
A $50\sqrt{3}$ **B** $150\sqrt{3}$ **C** $150\sqrt{2}$ **D** 75
- Q41.** If $\sin A = \frac{2}{3}$, then value of $\cot A$ is: 1 M
A $\frac{\sqrt{5}}{2}$ **B** $\frac{3}{2}$ **C** $\frac{5}{4}$ **D** $\frac{2}{3}$
- Q42.** The common difference of an AP, whose n^{th} term is $a_n = (3n + 7)$, is: 1 M
A 3 **B** 7 **C** 10 **D** 6
- Q43.** In a family of 3 children, the probability of having at least one boy is: 1 M
A $\frac{7}{8}$ **B** $\frac{1}{8}$ **C** $\frac{5}{8}$ **D** $\frac{3}{4}$
- Q44.** If the sum of zeroes of the polynomial $p(x) = 2x^2 - k\sqrt{2}x + 1$ is $\sqrt{2}$, then value of k is: 1 M
A $\sqrt{2}$ **B** 2 **C** $2\sqrt{2}$ **D** $\frac{1}{2}$
- Q45.** If the n^{th} term of an A.P. is $(2n + 1)$, then the sum of its first three terms is: 1 M
A $6n + 3$ **B** 15 **C** 12 **D** 21
- Q46.** In Fig. 1, O is the centre of a circle, AB is a chord and AT is the tangent at A. If $\angle AOB = 100^\circ$ then $\angle BAT$ is equal to: 1 M

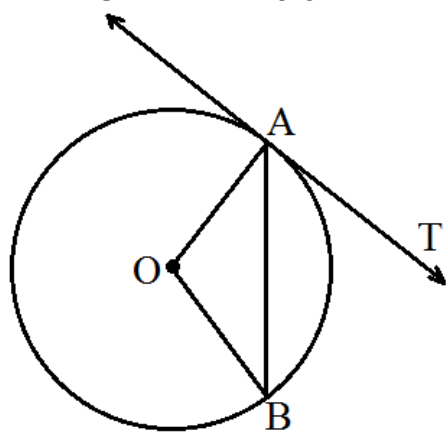


Fig. 1

- A** 100° **B** 40° **C** 50° **D** 90°
- Q47.** A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45° . Then the height (in meters) of the tower is: 1 M
A $25\sqrt{2}$ **B** $25\sqrt{3}$ **C** 25 **D** 12.5

- Q48.** In a right triangle ABC, right-angled at B, BC = 12cm and AB = 5 cm. The radius of the circle inscribed in the triangle (in cm) is: **1 Mark**
A 4 **B** 3 **C** 2 **D** 1
- Q49.** If the common difference of an A.P. is 3, then $a_{20} - a_{15}$ is: **1 M**
A 5 **B** 3 **C** 15 **D** 20
- Q50.** If the points A(x, 2), B(-3, -4) and C(7, -5) are collinear, then the value of x is: **1 M**
A -63 **B** 63 **C** 60 **D** -60
- Q51.** On dividing a polynomial p(x) by $x^2 - 4$, quotient and remainder are found to be x and 3 respectively. The polynomial p(x) is: **1 M**
A $3x^2 + x - 12$ **B** $x^3 - 4x + 3$ **C** $x^2 + 3x - 4$ **D** $x^3 - 4x - 3$
- Q52.** The pair of linear equations.
 $\frac{3x}{2} + \frac{5y}{3} = 7$ and $9x + 10y = 14$ is: **1 M**
A Consistent. **B** Inconsistent.
C Consistent with one solution. **D** Consistent with many solutions.
- Q53.** If α, β are the zeroes of a polynomial $p(x) = x^2 + x - 1$, then, $\frac{1}{\alpha} + \frac{1}{\beta}$ equals to: **1 M**
A 1 **B** 2 **C** -1 **D** $-\frac{1}{2}$
- Q54.** In an A.P., if the first term $a = 7$, nth term $a_n = 84$ and the sum of first n terms $s_n = \frac{2093}{2}$, then n is equal to: **1 M**
A 22 **B** 24 **C** 23 **D** 26
- Q55.** If two different dice are rolled together, the probability of getting an even number on both dice, is: **1 M**
A $\frac{1}{36}$ **B** $\frac{1}{2}$ **C** $\frac{1}{6}$ **D** $\frac{1}{4}$
- Q56.** The equation $x^2 - 8x + k = 0$ has real and distinct roots if: **1 M**
A $k = 16$ **B** $k > 16$ **C** $k = 8$ **D** $k < 16$
- Q57.** In a survey, it is found that every fifth person has a vehicle. The probability of a person NOT having a vehicle, is: **1 M**
A $\frac{1}{5}$ **B** 5% **C** $\frac{4}{5}$ **D** 95%
- Q58.** The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is: **1 M**
A 4 **B** ± 4 **C** -4 **D** 0
- Q59.** A box contains 90 discs, numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears a prime - number less than 23, is: **1 M**
A $\frac{7}{20}$ **B** $\frac{10}{90}$ **C** $\frac{4}{45}$ **D** $\frac{9}{89}$
- Q60.** The first three terms of an AP respectively are $3y - 1$, $3y + 5$ and $5y + 1$. Then y equals: **1 M**
A -3 **B** 4 **C** 5 **D** 2
- Q61.** The length of shadow of a tower on the plane ground is $\sqrt{3}$ times the height of the tower. The angle of elevation of sun is: **1 M**
A 45° **B** 30° **C** 60° **D** 90°
- Q62.** Which of the following can not be the probability an event? **1 Mark**

A 1.5

B $\frac{3}{5}$

C 25%

D 0.3

Q63. The co-ordinates of the point which is reflection of point $(-3, 5)$ in x-axis are.

1 M

A $(3, 5)$

B $(3, -5)$

C $(-3, -5)$

D $(-3, 5)$

Q64. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is:

1 M

A 1 : 2

B 1 : 4

C 1 : 6

D 1 : 8

Q65. Two dice are rolled together. The probability of getting sum of numbers on the two dice as 2, 3 or 5, is:

1 M

A $\frac{7}{36}$

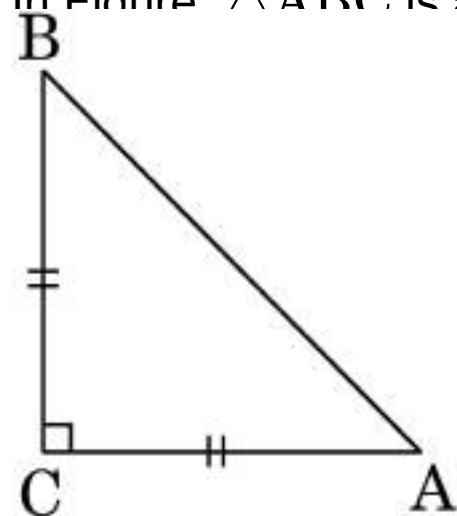
B $\frac{11}{36}$

C $\frac{5}{36}$

D $\frac{4}{9}$

Q66. In Figure $\triangle ABC$ is an isosceles triangle, right-angled at C. Therefore.

1 M



A $AB^2 = 2AC^2$

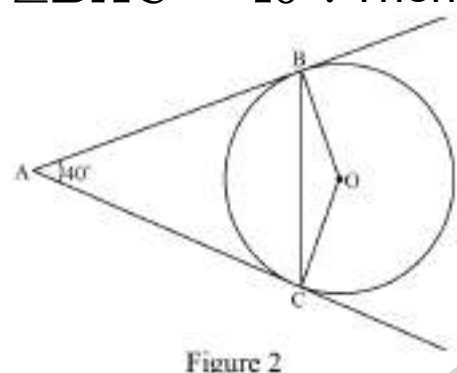
B $BC^2 = 2AB^2$

C $AC^2 = 2AB^2$

D $AB^2 = 4AC^2$

Q67. In Figure 2, AB and AC are tangents to the circle with centre O such that $\angle BAC = 40^\circ$. Then $\angle BOC$ is equal to:

1 M



A 40°

B 50°

C 140°

D 150°

Q68. A bag contains 3 red, 5 black and 7 white balls. A ball is drawn from the bag at random. The probability that the ball drawn is not black, is:

1 M

A $\frac{1}{3}$

B $\frac{9}{15}$

C $\frac{5}{10}$

D $\frac{2}{3}$

Q69. The value of k, for which the pair of linear equations $kx + y = k^2$ and $x + ky = 1$ have infinitely many solutions is:

1 M

A ± 1

B 1

C -1

D 2

Q70. The value of k for which the points A $(0, 1)$, B $(2, k)$ and C $(4, -5)$ are collinear is:

1 M

A 2

B -2

C 0

D 4

Q71. Two circles touch each other externally at P. AB is a common tangent to the circles touching them at A and B. The value of $\angle APB$ is:

1 M

A 30°

B 45°

C 60°

D 90°

Q72. If α, β are the zeroes of the polynomial $6x^2 - 5x - 4$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to:

1 M

A $\frac{5}{4}$

B $-\frac{5}{4}$

C $\frac{4}{5}$

D $\frac{5}{24}$

- Q73.** Curved surface area of a cylinder of height 5cm is 94.2cm². Radius of the cylinder is (Take $\pi = 3.14$). 1 Mark
A 2cm **B** 3cm **C** 2.9cm **D** 6cm
- Q74.** Two dice are thrown together. The probability of getting the same number on both dice is: 1 M
A $\frac{1}{2}$ **B** $\frac{1}{3}$ **C** $\frac{1}{6}$ **D** $\frac{1}{12}$
- Q75.** The value of λ for which $(x^2 + 4x + \lambda)$ is a perfect square, is: 1 M
A 16 **B** 9 **C** 1 **D** 4
- Q76.** If the point P (6, 2) divides the line segment joining A (6, 5) and B (4, y) in the ratio 3 : 1, then the value of y is. 1 M
A (2, 0) **B** (0, 2) **C** (3, 0) **D** (2, 2)
- Q77.** If $\cos(\alpha + \beta) = 0$, then value of $\cos\left(\frac{\alpha + \beta}{2}\right)$ is equal to: 1 M
A $\frac{1}{\sqrt{2}}$ **B** $\frac{1}{2}$ **C** 0 **D** $\sqrt{2}$
- Q78.** The roots of the equation $x^2 + x - p(p + 1) = 0$, where p is a constant, are: 1 M
A p, p + 1 **B** -p, p + 1 **C** p, -(p + 1) **D** -p, -(p + 1)
- Q79.** Which of the following is a quadratic polynomial with zeroes $\frac{5}{3}$ and 0? 1 M
A $3x(3x - 5)$ **B** $3x(x - 5)$
C $x^2 - \frac{5}{3}$ **D** $\frac{5}{3}x^2$
- Q80.** The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is: 1 M
A $x^2 + 5x + 6$. **B** $x^2 - 5x + 6$. **C** $x^2 - 5x - 6$. **D** $-x^2 + 5x + 6$.
- Q81.** If $2 \tan A = 3$, then the value of $\frac{4 \sin A + 3 \cos A}{4 \sin A - 3 \cos A}$ is: 1 M
A $\frac{7}{\sqrt{13}}$ **B** $\frac{1}{\sqrt{13}}$ **C** 3 **D** Does not exist
- Q82.** $\left[\frac{5}{8}\sec^2 60^\circ - \tan^2 60^\circ + \cos^2 45^\circ\right]$ is equal to 1 M
A $\frac{-5}{3}$ **B** $\frac{-1}{2}$ **C** 0 **D** $\frac{-1}{4}$
- Q83.** A number is selected at random from the numbers 1 to 30. The probability that it is a prime number is: 1 M
A $\frac{2}{3}$ **B** $\frac{1}{6}$ **C** $\frac{1}{3}$ **D** $\frac{11}{30}$
- Q84.** In Figure 2, P(5, -3) and Q(3, y) are the points of trisection of the line segment joining A(7, -2) and B(1, -5). Then y equals 1 M

A 2 **B** 4 **C** -4 **D** $-\frac{5}{2}$
- Q85.** **Directions:** In a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. 1 M
Assertion (A): The tangents drawn at the end points of a diameter of a circle, are parallel.
Reason (R): Diameter of a circle is the longest chord.

A Both, Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).

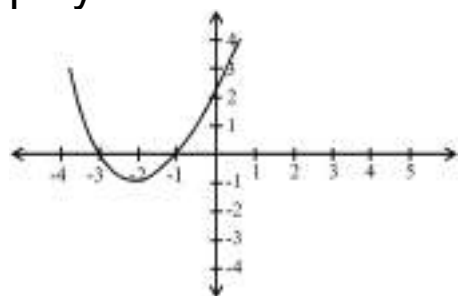
C Assertion (A) is true but Reason (R) is false.

B Both, Assertion (A) and Reason (R) are true but Reason (R) is not correct explanation for Assertion (A).

D Assertion (A) is false but Reason (R) is true.

Q86. In fig. the graph of the polynomial $p(x)$ is given. The number of zeroes of the polynomial is:

1 M



A 1

B 2

C 3

D 0

Q87. In Fig.2, a circle with centre O is inscribed in a quadrilateral ABCD such that, it touches the sides BC, AB, AD and CD at points P, Q, R and S respectively, If $AB = 29\text{cm}$, $AD = 23\text{cm}$, $\angle B = 90^\circ$ and $DS = 5\text{cm}$, then the radius of the circle (in cm.) is:

1 M

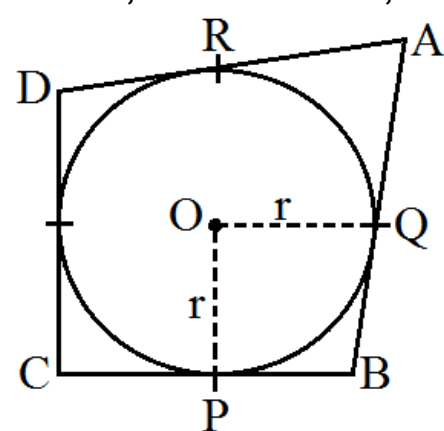


Fig. 2

A 11

B 18

C 6

D 15

Q88. The area of metal sheet required to make a closed hollow cylinder of height 2.4m and base radius 0.7m, is:

1 M

A 10.56m^2

B 13.52m^2

C 13.64m^2

D 14.08m^2

Q89. A chord of a circle of radius 10cm subtends a right angle at its centre. The length of the chord (in cm) is:

1 M

A $5\sqrt{2}$

B $10\sqrt{2}$

C $\frac{5}{\sqrt{2}}$

D $10\sqrt{3}$

Q90. The mid-point of segment AB is the point P(O, 4). If the coordinates of B are (-2, 3) then the coordinates of A are:

1 M

A (2, 5)

B (-2, -5)

C (2, 9)

D (-2, 11)

Q91. In Figure, PQ is tangent to the circle with centre at O, at the point B. If $\angle AOB = 100^\circ$, then $\angle ABP$ is equal to:

1 M

A 50°

B 40°

C 60°

D 80°

Q92. If 1 is a root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then ab equals:

1 M

A 3

B $-\frac{7}{2}$

C 6

D -3

Q93. The radius (in cm) of the largest right circular cone that can be cut out from a cube Of edge 4.2 cm is

1 M

A 4.2

B 2.1

C 8.4

D 1.05

Q94. From a point Q, 13cm away from the centre of a circle, the length of tangent PQ to the circle is 12cm. The radius of the circle (in cm) is:

1 M

A 25

B $\sqrt{313}$

C 5

D 1

- Q95.** The angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of the tower is 45° . The height of the tower (in metres) is: **1 M**
 A 15 B 30 C $30\sqrt{3}$ D $10\sqrt{3}$
- Q96.** Which of the following is not probability of an event? **1 M**
 A 0.89 B 52% C $\frac{1}{13}\%$ D $\frac{1}{0.89}$
- Q97.** The least positive value of k, for which the quadratic equation $2x^2 + kx - 4 = 0$ has rational roots, is: **1 M**
 A $\pm 2\sqrt{2}$ B 2 C ± 2 D $\sqrt{2}$
- Q98.** If the area of a circle is equal to sum of the areas of two circles of diameters 10cm and 24cm, then the diameter of the larger circle (in cm) is: **1 M**
 A 34 B 26 C 17 D 14
- Q99.** In a group of 20 people, 5 can't swim. If one person is selected at random, then the probability that he/ she can swim, is: **1 M**
 A $\frac{3}{4}$ B $\frac{1}{3}$ C 1 D $\frac{1}{4}$
- Q100. Directions:** In a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1 M**
Assertion (A): If the graph of a polynomial touches x-axis at only one point, then the polynomial cannot be a quadratic polynomial.
Reason (R): A polynomial of degree $n(n > 1)$ can have at most n Zeroes.
 A Both, Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A). B Both, Assertion (A) and Reason (R) are true but Reason (R) is not correct explanation for Assertion (A).
 C Assertion (A) is true but Reason (R) is false. D Assertion (A) is false but Reason (R) is true.
- Q101.** The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$ is : **1 M**
 A P B -P C -1 D 1
- Q102.** The distance between the points $(0, 2\sqrt{5})$ and $(-2\sqrt{5}, 0)$ is: **1 M**
 A $2\sqrt{10}$ units B $4\sqrt{10}$ units
 C $2\sqrt{20}$ units D 0
- Q103.** A kite is flying at a height of 30m from the ground. The length of string from the kite to the ground is 60m. Assuming that there is no slack in the string, the angle of elevation of the kite at the ground is: **1 M**
 A 45° B 30° C 60° D 90°
- Q104.** The first three terms of an AP respectively are $3y - 1$, $3y + 5$ and $5y + 1$. Then y equals: **1 M**
 A -3 B 4 C 5 D 2
- Q105.** ABCD is a rectangle whose three vertices are B(4, 0), C(4, 3) and D(0, 3). The length of one of its diagonals is: **1 M**
 A 5 B 4 C 3 D 25
- Q106.** In an A.P., if the first term (a) = -16 and the common difference (d) = -2, then the sum of first 10 terms is: **1 M**

A - 200

B - 70

C - 250

D 250

Q107. The sum of exponents of prime factors in the prime-factorisation of 196 is: 1 M

A 3

B 4

C 5

D 2

Q108. The first term of an AP is p and the common difference is q , then its 10th term is: 1 M

A $q + 9p$.

B $p - 9q$.

C $p + 9q$.

D $2p + 9q$.

Q109. In Fig. 1, the sides AB, BC and CA of a triangle ABC, touch a circle at P, Q and R respectively. If $PA = 4\text{cm}$, $BP = 3\text{cm}$ and $AC = 11\text{cm}$, then the length of BC (in cm) is: 1 M

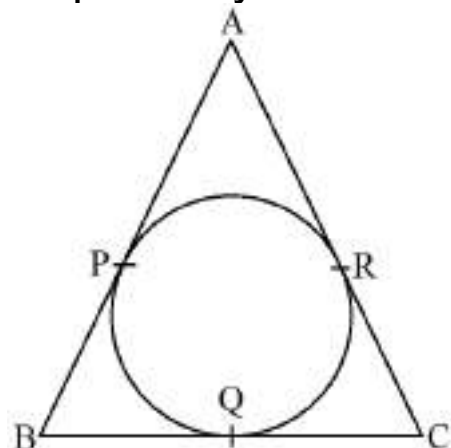


Fig.1

A 11

B 10

C 14

D 15

Q110. If (a, b) is the mid-point of the line segment joining the points $A(10, -6)$ and $B(k, 4)$ and $a - 2b = 18$, the value of k is: 1 M

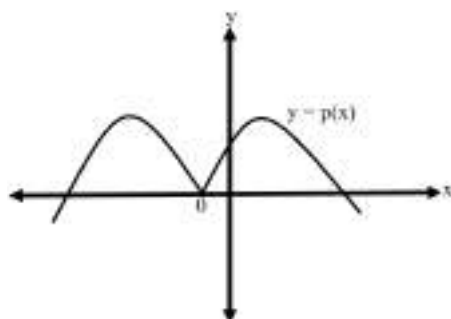
A 30

B 22

C 4

D 40

Q111. The number of zeroes for a polynomial $p(x)$ where graph of $y = p(x)$ is given in Figure, is: 1 M



A 3

B 4

C 0

D 5

Q112. The perimeter (in cm) of a square circumscribing a circle of radius a cm, is 1 M

A $8a$

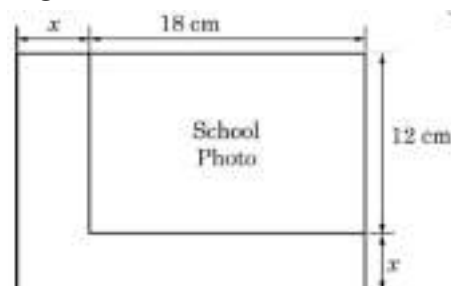
B $4a$

C $2a$

D $16a$

Q113. While designing the school year book, a teacher asked the student that the length and width of a particular photo is increased by x units each to double the area of the photo. The original photo is 18cm long and 12cm wide. Based on the above information, answer the following questions: 4 M

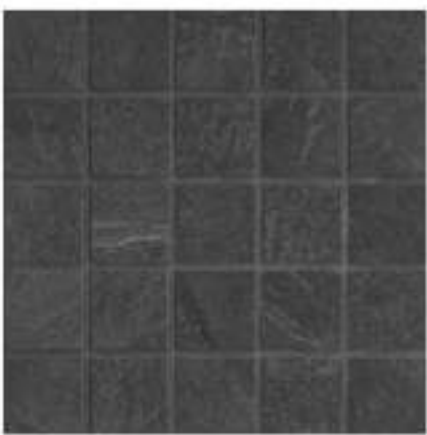
1. Write an algebraic equation depicting the above information.
2. Write the corresponding quadratic equation in standard form.
3. What should be the new dimensions of the enlarged photo?



OR

3. Can any rational value of x make the new area equal to 220cm?

Q114. A rectangular floor area can be completely tiled with 200 square tiles. If the side length of each tile is increased by 1 unit, it would take only 128 tiles to cover the floor. 4 M



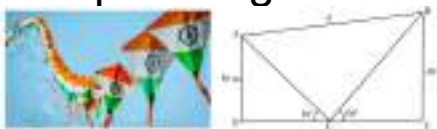
1. Assuming the original length of each side of a tile be x units, make a quadratic equation from the above information.
2. Write the corresponding quadratic equation in standard form.
- 3.
1. Find the value of x , the length of side of a tile by factorisation.

OR

2. Solve the quadratic equation for x , using quadratic formula.

Q115. Kite festival is celebrated in many countries at different times of the year. In India, every year 14th January is celebrated as International Kite Day. On this day many people visit India and participate in the festival by flying various kinds of kites. The picture given below, shows three kites flying together:

4 M



In Fig. the angles of elevation of two kites (Points A and B) from the hands of a man (Point C) are found to be 30° and 60° respectively. Taking $AD = 50\text{m}$ and $BE = 60\text{m}$ find:

1. The lengths of strings used (take them straight) for kites A and B as shown in the figure.
2. The distance 'd' between these two kites.

Q116. India meteorological department observes seasonal and annual rainfall every year in different sub-divisions of our country.

4 M



It helps them to compare and analyse the results. The table given below shows sub-division wise seasonal (monsoon) rainfall (mm) in 2018:

Rainfall (mm)	Number of Sub-divisions
200-400	2
400-600	4
600-800	7
800-1000	4
1000-1200	2
1200-1400	3
1400 -1600	1
1600-1800	1

Based on the above information, answer the following questions:

1. Write the modal class.

2. Find the median of the given data.

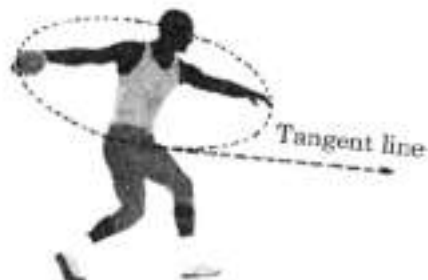
OR

2. Find the mean rainfall in this season.

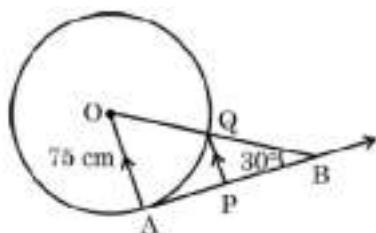
3. If sub-division having at least 1000 mm rainfall during monsoon season, is considered good rainfall sub-division, then how many sub-divisions had good rainfall?

Q117. The discus throw is an event in which an athlete attempts to throw a discus. The athlete spins anti-clockwise around one and a half times through a circle, then releases the throw. When released, the discus travels along tangent to the circular spin orbit.

4 M



In the given figure, AB is one such tangent to a circle of radius 75cm. Point O is centre of the circle and $\angle ABO = 30^\circ$. PQ is parallel to OA.



Based on above information:

1. Find the length of AB.
2. Find the length of OB.
3. Find the length of AP.

OR

3. Find the length of PQ.

Q118. Yoga is an ancient practice which is a form of meditation and exercise. By practising yoga, we not even make our body healthy but also achieve inner peace and calmness. The International Yoga Day is celebrated on 21st of June every year since 2015.

4 M

To promote Yoga, Green park society in Pune organised a 7-day Yoga camp in their society. The number of people of different age groups who enrolled for this camp is given as follows:



Age Group	15-25	25-35	35-45	45-55	55-65	65-75	75-85
Number of People	8	10	15	25	40	25	18

Based on the above, find the following:

1. Find the median age of people enrolled for the camp:
2. If x more people of age group 65-75 had enrolled for the camp, the mean age would have been 58. Find the value of x :

Q119. BINGO is game of chance. The host has 75 balls numbered 1 through 75. Each player has a BINGO card with some numbers written on it. The participant cancels the number on the card when called out a number written on the ball selected at random. Whosoever cancels all the numbers on his/her card, says BINGO and wins the game.

6 M



The table given below, shows the data of one such game where 48 balls were used before Tara said 'BINGO'.

Numbers announced	Number of times
0-15	8
15-30	9
30-45	10
45-60	12
60-75	9

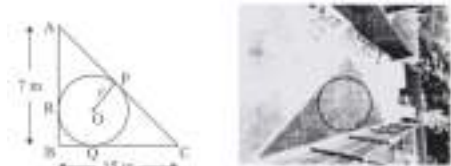
Based on the above information, answer the following:

- Write the median class.
- When first ball was picked up, what was the probability of calling out an even number?
- Find median of the given data.

OR

- Find mode of the given data.

Q120. A backyard is in the shape of a triangle ABC with right angle at B. $AB = 7\text{m}$ and $BC = 15\text{m}$. A circular pit was dug inside it such that it touches the walls AC, BC and AB at P, Q and R respectively such that $AP = x\text{ m}$. **6 M**



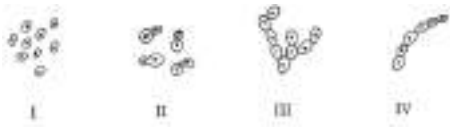
Based on the above information, answer the following questions:

- Find the length of AR in terms of x .
- Write the type of quadrilateral BQOR.
- Find the length PC in terms of x and hence find the value of x .

OR

- Find x and hence find the radius r of circle.

Test / Exam Name: Science Pyq

- Q1.** Four students P, Q, R and S differently reported the following set of organs to be analogous: 1 M
 16. Forelimb of a frog and forelimb of a lizard.
 17. Forelimb of a bird and forelimb of a human.
 18. Wings of a parrot and wings of a butterfly.
 19. Wings of a bird and wings of a bat.
 The two student who have reported correctly are:
A P and Q **B** Q and R **C** R and S **D** P and S
- Q2.** Acetic acid reacts with solid sodium hydrogen carbonate: 1 M
A Slowly forming no gas. **B** Vigorously with effervescence.
C Slowly without effervescence. **D** Vigorously without gas formation.
- Q3.** A student has to determine the focal length of a concave mirror by obtaining the image of a distant object on a screen. For getting best result he should focus: 1 M
A A distant tree or an electric pole. **B** A well-illuminated distant building.
C Well-lit grills of the nearest window. **D** A burning candle laced at the distant edge of the laboratory table.
- Q4.** In which of the following figures in budding *not* shown? 1 M

A I **B** II **C** III **D** IV
- Q5.** After viewing different slides, a student draws following diagrams. Select the one which depicts binary fission in amoeba. 1 M

A a **B** b **C** c **D** d
- Q6.** A student puts a drop of reaction mixture of a personification reaction first on a blue litmus paper and then on a red litmus paper. He may observe that: 1 M
A There is no change in the blue litmus paper and the red litmus paper turns white. **B** here is no change in the red litmus paper and the blue litmus paper turns red.
C There is no change in the blue litmus paper and the red litmus paper turns blue. **D** No change in colour is observed in both the litmus papers.
- Q7.** An optical device has been given to a student and he determines its focal length by focusing the image of the sun on a screen placed 24 cm from the device on the same side as the sun. Select the correct statement about the device. 1 M
A Convex mirror of focal length 12 cm. **B** Convex lens of focal length 24 cm.
C Concave mirror of focal length 24 cm. **D** Convex lens of focal length 12 cm.
- Q8.** A student very cautiously traces the path of a ray through a glass slab for different values of the angle of incidence refraction($\angle i$). He then measures the corresponding values of the angle of refraction ($\angle r$) and the angle of emergence ($\angle e$) for every 1 M

value of the angle of incidence. On analysing these measurements of angles, his conclusion would be.

A $\angle i > \angle r > \angle e$

B $\angle i = \angle e > \angle r$

C $\angle i < \angle r < \angle e$

D $\angle i = \angle e < \angle r$

- Q9.** These consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: 1 M

Assertion (A): The anaerobic respiration which takes place in yeast, has one of the end products as an acid.

Reason (R): During anaerobic respiration, there is incomplete breakdown of glucose.

A Both (A) and (R) are true and (R) is the correct explanation of (A).

B Both (A) and (R) are true, but (R) is not the correct explanation of (A).

C (A) is true, but (R) is false.

D (A) is false, but (R) is true.

- Q10.** Four students P, Q, R and S differently reported the following set of organs to be analogous: 1 M

16. Forelimb of a frog and forelimb of a lizard.

17. Forelimb of a bird and forelimb of a human.

18. Wings of a parrot and wings of a butterfly.

19. Wings of a bird and wings of a bat.

The two student who have reported correctly are:

A P and Q.

B Q and R.

C R and S.

D P and S.

- Q11.** $\text{MnO}_2 + x \text{HCl} \rightarrow \text{MnCl}_2 + y \text{H}_2\text{O} + z \text{Cl}_2$ 1 M
In order to balance the above chemical equation, the values of x, y and z respectively are:

A 6, 2, 2

B 4, 1, 2

C 4, 2, 1

D 2, 2, 1

- Q12.** Which one of the following sets of materials can be used to prepare soap? 1 M

A Neem oil and calcium hydroxide.

B Castor oil and sodium hydroxide.

C Mineral oil and sodium hydroxide.

D Neem oil and magnesium hydroxide.

- Q13.** The balanced chemical equation showing reaction between quicklime and water is: 1 M

A $2\text{CaO} + \text{H}_2\text{O} \rightarrow 2\text{CaOH} + \text{H}_2 + \text{Heat}$.

B $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{H}_2 + \text{Heat}$.

C $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{Heat}$.

D $2\text{CaO} + 3\text{H}_2\text{O} \rightarrow 2\text{Ca(OH)}_3 + \text{O}_2 + \text{Heat}$.

- Q14.** Fleming's Right-hand rule gives 1 M

A Magnitude of the induced current.

B Magnitude of the magnetic field.

C Direction of the induced current.

D Both, direction and magnitude of the induced current.

- Q15.** For demonstrating the preparation of soap in the laboratory which of the following combinations of an oil and a base would be most suitable? 1 M

A Mustard oil and calcium hydroxide.

B Castor oil and calcium hydroxide.

C Turpentine oil and sodium hydroxide.

D Mustard oil and sodium hydroxide.

- Q16.** In domestic electric circuits the wiring with 15 A current rating is for the electric devices which have: 1 M

A Higher power ratings such as geyser.

B Lower power ratings such as fan.

C Metallic bodies and low power ratings.

D Non-metallic bodies and low power ratings.

- Q17.** To determine the focal length of a convex lens by obtaining a sharp image of a distant object we generally follow the following steps which are not in proper sequence. 1 M

1. Hold the lens between the object and the screen.

2. Measure the distance between the lens and the screen.

Q26. Study the following statements:

1 Mark

1. Wings of birds and wings of bats are homologous organs.
2. Wings of birds and wings of insects are modified forelimbs.
3. Wings of birds and wings of insects are analogous organs.
4. Wings of birds and forelimbs of horse are homologous organs.

The correct statements are:

- A** I and II **B** II and III **C** III and IV **D** I and IV

Q27. Select the set of homologous organs from the following:

1 M

- A** Wings of pigeon and a butterfly. **B** Wings of bat and a pigeon.
C Forelimbs of cow, a duck and a lizard. **D** Wings of butterfly and a bat.

Q28. A student was asked by his teacher to find the image distance for various object distances in case of a given convex lens. He performed the experiment with all precautions and noted down his observations in the following table:

1 M

S. No.	Object distance (cm)	Image distance (cm)
1	60	15
2	48	16
3	36	21
4	24	24
5	18	36
6	16	48

After checking the observation table the teacher pointed out that there is mistake in recording the image distance in one of the observation. Find the serial number of the observation having faulty image distance:

- A** 2 **B** 3 **C** 5 **D** 6

Q29. A student adds a few drops of ethanoic acid to test tubes X, Y and Z containing aqueous solutions of sodium chloride, sodium hydroxide and sodium carbonate respectively. If he now brings a burning splinter near the mouth of the test tubes immediately after adding the ethanoic acid in each one of them, in which of the test tube or test tubes the flame gets extinguished?

1 M

- A** X and Y **B** Y and Z **C** X and Z **D** Only Z

Q30. While studying saponification reaction for the preparation of soap, the teacher suggested to a student to add a small quantity of common salt to the reaction mixture. The function of common salt in this reaction is to:

1 M

- A** Reduce the alkalinity of the soap. **B** Reduce the acidity of the soap.
C Enhance the cleansing capacity of soap. **D** Favour precipitation of soap.

Q31. The image distance from the eye lens in the normal eye when we increase the distance of an object from the eye.

1 M

- A** Increases. **B** Decreases.
C Remains unchanged. **D** Depends on the size of the eyeball

Q32. Hydronium ions are formed by the reaction between:

1 M

- A** Sodium hydroxide and water. **B** Calcium chloride and water.
C Hydrogen chloride gas and water. **D** Ethanol and water.

Q33. Assertion (A): The sex of a child in human beings will be determined by the type of chromosome he/ she inherits from the father.

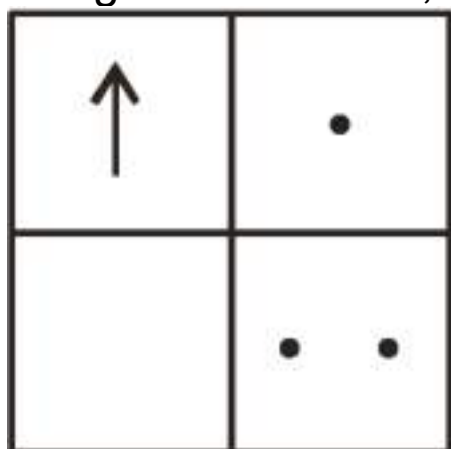
1 M

Reason (R): A child who inherits 'X' chromosome from his father would be a girl (XX), while a child who inherits a 'Y' chromosome from the father would be a boy (XY).

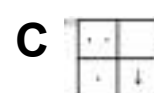
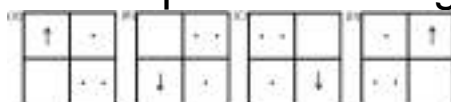
- A** Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).
C (A) is true, but (R) is false.

- B** Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
D (A) is false, but (R) is true.

Q34. If you focus the image of a distant object, whose shape is given below, on a screen using a convex lens, 1 M



the shape of the image of this object on the screen would be:



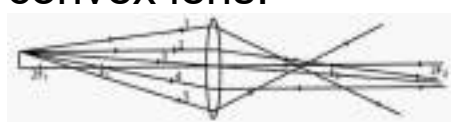
Q35. Identify the food chain in which the organisms of the second trophic level are missing: 1 M

- A** Grass, goat, lion
B Zooplankton, Phytoplankton, small fish, large fish
C Tiger, grass, snake, frog
D Grasshopper, grass, snake, frog, eagle

Q36. The shape of yeast cell is: 1 M

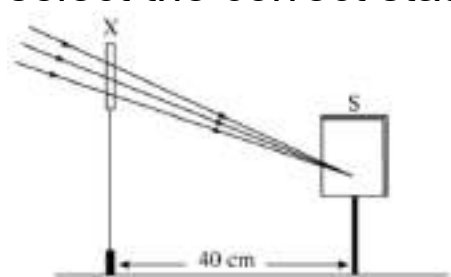
- A** Only spherical.
B Only oval.
C Irregular.
D Both oval and spherical.

Q37. Out of the five incident rays shown in the figure find the three rays that are obeying the laws of refraction and may be used for locating the position of image formed by a convex lens: 1 M



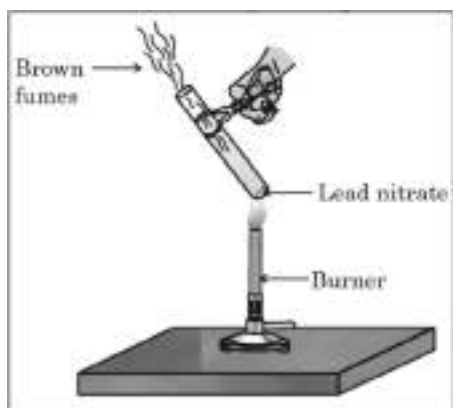
- A** 1,2 and 3
B 2,3 and 4
C 3,4 and 5
D 1,2 and 4

Q38. A student focused the image of a distant object using a device 'X' on a white screen 'S' as shown in the figure. If the distance of the screen from the device is 40 cm, select the correct statement about the device. 1 M



- A** The device X is a convex lens of focal length 20 cm.
B The device X is a concave mirror of focal length 40 cm.
C The device X is a convex mirror of radius of curvature 40 cm.
D The device X is a convex lens of focal length 40 cm.

Q39. The emission of brown fumes in the given experimental set-up is due to 1 M



- A** Thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.
- B** Thermal decomposition of lead nitrate which produces brown fumes of lead oxide.
- C** Oxidation of lead nitrate forming lead oxide and nitrogen dioxide.
- D** Oxidation of lead nitrate forming lead oxide and oxygen.

Q40. A student has to focus his compound microscope to observe a prepared slide showing different stages of binary fission in Amoeba. The steps he is likely to follow are listed below in a haphazard manner: **1 M**

1. Adjust the diaphragm and the mirror of the microscope so that sufficient light may enter to illuminate the slide.
2. Fix the slide on the stage carefully.
3. Adjust the microscope to high power and focus.
4. Adjust the microscope to low power and focus.

The correct sequence of the above steps to observe the slide under the microscope is:

- A** I, II, IV, III **B** II, I, IV, III **C** II, IV, I, III **D** I, IV, II, III

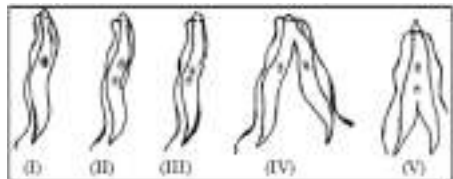
Q41. A student is using a convex lens of focal length 10 cm to study the image formation by a convex lens for the various positions of the object. In one of his observations, he may observe that when the object is placed at a distance of 20 cm from the lens, its image is formed at (select the correct option): **1 M**

- A** 20 cm on the other side of the lens and is of the same size, real and erect.
- B** 40 cm on the other side of the lens and is magnified, real and inverted.
- C** 20 cm on the other side of the lens and is of the same size, real and inverted.
- D** 20 cm on the other side of the lens and is of the same size, virtual and erect.

Q42. A student has obtained an image of a distant object on a screen to determine the focal length F_1 of the given lens. His teacher after checking the image, gave him another lens of focal length F_2 and asked to focus the same object on the same screen. The student found that to obtain a sharp image he has to move the lens away from the screen. From this finding we may conclude that both the lenses given to the student were: **1 M**

- A** Concave and $F_1 < F_2$ **B** Convex and $F_1 < F_2$
- C** Convex and $F_1 > F_2$ **D** Concave and $F_1 > F_2$

Q43. Choose the correct order of the stages of binary fission in Leishmania. **1 M**



- A** I, II, III, IV, V **B** I, III, II, V, IV **C** I, III, V, II, IV **D** I, II, III, V, IV

Q44. Q. No. 17 to 20 are Assertion — Reasoning based questions. These consist of two statements — Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below. **1 M**

Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) is responsible for brown eyes, then the colour of eyes of the progeny having gene combination Bb, bb or BB will be black only.

Reason (R): The black colour of the eyes is a dominant trait.

A Both (A) and (R) are true and (R) is the correct explanation of (A).
C (A) is true but (R) is false.

B Both (A) and (R) are true but (R) is not the correct explanation of (A).
D (A) is false but (R) is true.

Q45. An object is placed in front of a convex mirror at infinity. According to the New Cartesian Sign Convention, the sign of the focal length and the sign of the image distance in this case are respectively:

1 M

A +, - **B** -, + **C** -, - **D** +, +

Q46. A student obtained a sharp image of a burning candle, placed at the farther end of a laboratory table, on a screen using a concave mirror. For getting better value of focal length of the mirror, the subject teacher suggested him for focusing a well illuminated distant object. What should the student do?

1 M

A He should move the mirror away from the screen. **B** He should move the mirror slightly towards the screen.
C He should move the mirror as well as the screen towards the newly selected object. **D** He should move only the screen towards the newly selected object.

Q47. Read the following statements:

1 M

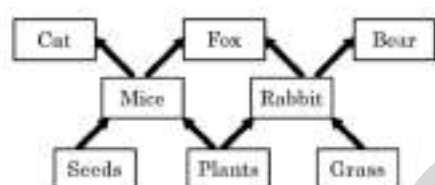
1. When a red litmus paper is dipped into reaction mixture of a saponification reaction, it turns blue and the reaction is exothermic.
2. When a blue litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is exothermic.
3. When a red litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is endothermic.
4. When a blue litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is endothermic.

Which of the above statements are correct?

A I and II **B** II and III **C** III and IV **D** I and IV

Q48. Study the given figure of a Food web and identify the primary consumer in the food web:

1 M



A Mice and Bear **B** Rabbit and Cat **C** Rabbit and Fox **D** Mice and Rabbit

Q49. A stomata closes when:

1 M

1. it needs carbon dioxide for photosynthesis.
2. it does not need carbon dioxide for photosynthesis.
3. water flows out of the guard cells.
4. water flows into the guard cells.

The correct reason(s) in this process is/ are:

A (i) only **B** (i) and (iii) **C** (ii) and (iii) **D** (ii) and (iv)

Q50. When aqueous solutions of potassium iodide and lead nitrate are mixed, an msoluble substance separates out. The chemical equation for the reaction mvolved is:

1 M

A $KI + PbNO_3 \rightarrow PbI + KNO_3$ **B** $2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$
C $KI + Pb(NO_3)_2 \rightarrow PbI + KNO_3$ **D** $KI + PbNO_3 \rightarrow PbI_2 + KNO_3$

Q51. Three students A, B and C focussed a distant building on a screen with the help of a concave mirror. To determine focal length of the concave mirror they measured the distances as given below:

1 M

Student A : From mirror to the screen.
 Student B : From building to the screen.
 Student C : From building to the mirror.

3. 57.7cm.

4. 72.7cm.

The correct position of the screen was suggested by.

A A

B B

C C

D D

Q68. A student while observing an embryo of a pea seed in the laboratory listed various parts of the embryo as given below: Testa, Tegmen, Radicle, Plumule, Micropyle, Cotyledon.

1 M

On examining the list the teacher remarked that only three parts are correct. Select three correct parts from the above list:

A Testa, Radicle, Cotyledon.

B Tegmen, Radicle, Micropyle.

C Cotyledon, Plumule, Testa.

D Radicle, Cotyledon, Plumule.

Q69. A student traces the path of a ray of light through a rectangular glass slab for the different values of angle of incidence. He observes all possible precautions at each step of the experiment. At the end of the experiment, on analysing the measurements, which of the following conclusions is he likely to draw?

1 M

A $\angle i = \angle e < \angle r$

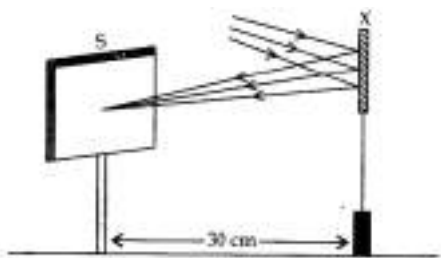
B $\angle i < \angle e < \angle r$

C $\angle i > \angle e > \angle r$

D $\angle i = \angle e > \angle r$.

Q70. A student focussed the image of a distant object using a device X on a white screen S as shown in the figure. If the distance of the screen from the device is 30cm, select the correct statement about the device X.

1 M



A The device X is a concave mirror of focal length 15cm

B The device X is a concave mirror of focal length 30cm.

C The device X is a concave mirror of radius of curvature 30m.

D The device X is a convex mirror of focal length 30cm.

Q71. A student has to observe a permanent slide of binary fission in amoeba. Find the correct sequence of steps given below for focussing the object under a microscope.

1 M

1. Place the slide on the stage, look through the eye-piece and adjust the mirror to get proper illumination.

2. Focus the Slide Share using fine adjustment screw.

3. Look through the eye-piece and raise the objective lens using coarse adjustment screw tin the object is focussed.

4. Look through the eye-piece and move the slide till the object is visible.

A d, c, b, a

B a, b,d, c

C a, d, c, b

D a, c, d, b

Q72. Oxides of aluminium and zinc are:

1 M

A acidic

B basic

C amphoteric

D neutral

Q73. From the following diagrams, select the correct ones showing stages of binary fission in Amoeba:

1 M



A I, II, III

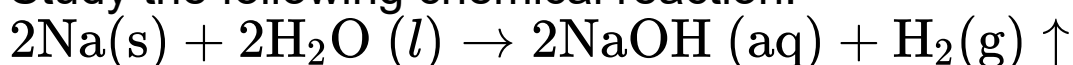
B IV, II, III

C V, II, III

D IV, I, III

Q74. Study the following chemical reaction:

1 M



The reducing agent in this reaction is:

A Na

B H₂O

C NaOH

D H₂

Q75.

1 Mark

After tracing the path of a ray of light passing through a rectangular glass slab for four different values of the angle of incidence, a student reported his observations in tabular form as given below:

S. No.	$\angle i$	$\angle r$	$\angle e$
I	30^0	19^0	29^0
II	40^0	28^0	40^0
III	50^0	36^0	50^0
IV	60^0	40^0	59^0

The best observation is:

- A I** **B II** **C III** **D IV**

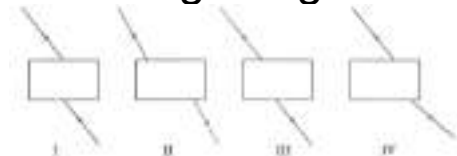
Q76. An electric kettle consumes 1kW of electric power when operated at 220V. The minimum rating of the fuse wire to be used for it is: **1 M**

- A 1A** **B 2A** **C 4A** **D 5A**

Q77. A student obtained a sharp image of a candle flame placed at the distant end of the laboratory table on a screen using a concave mirror to determine its focal length. The teacher suggested him to focus a distant building about 1 km far from the laboratory, for getting more correct value of the focal length. In order to focus the distant building on the same screen the student should slightly move the: **1 M**

- A** Mirror away from the screen. **B** Screen away from the mirror.
C Screen towards the mirror. **D** Screen towards the building.

Q78. Four students showed the following traces of the path of a ray of light passing through a rectangular glass slab. **1 M**



The trace most likely to be correct is that of student:

- A I** **B II** **C III** **D IV**

Q79. Identify the figures showing the process of budding in yeast. **1 M**



- A I, II and III** **B II, III and IV** **C I, II and IV** **D III, IV and I**

Q80. A student prepared 20% sodium hydroxide solution in a beaker containing water. The observations noted by him are given below. **1 M**

1. Sodium hydroxide is in the form of pellets.
2. It dissolves in water readily.
3. The beaker appears cold when touched from outside.
4. The red litmus paper turns blue when dipped into the solution.

The correct observations are:

- A I, II and III** **B II, III and IV** **C III, IV and I** **D I, II and IV**

Q81. Which of the following is a correct set of homologous organs? **1 M**

- A** Forelimbs of frog, bird and lizard. **B** Spine of cactus and thorn of bougainvillea.
C Wings of bat and wings of butterfly. **D** Wings of a bird and wings of a bat.

Q82. Which one of the following is responsible for the sustenance of underground water? **1 M**

- A** Loss of vegetation cover. **B** Diversion for high water demanding crops.
C Pollution from urban wastes. **D** Afforestation.

Q83. Sodium hydroxide is termed an alkali while Ferric hydroxide is not because: **1 Mark**

A Sodium hydroxide is a strong base, while Ferric hydroxide is a weak base.

C Sodium hydroxide is a strong base while Ferric hydroxide is a strong acid.

B Sodium hydroxide is a base which is soluble in water while Ferric hydroxide is also a base but it is not soluble in water.

D Sodium hydroxide and Ferric hydroxide both are strong base but the solubility of Sodium hydroxide in water is comparatively higher than that of Ferric hydroxide.

Q84. A student adds 4 ml of acetic acid to a test tube containing 4 mL of distilled water. He then shakes the test tube and leaves it to settle. After about 10 minutes he observes: **1 M**

A A layer of water over the layer of acetic acid.

C A precipitate settling at the bottom of the test tube.

B A layer of acetic acid over the layer of water.

D A clear colorless solution.

Q85. Select endothermic reaction from the following: **1 M**

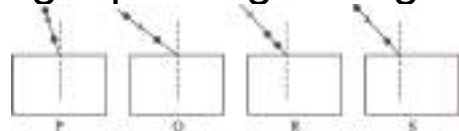
A Decomposition of vegetable matter into compost.

C Burning of a candle.

B Decomposition of calcium carbonate to form quick lime and carbon dioxide.

D Process of respiration.

Q86. Select from the following the best experimental set-up for tracing the path of a ray of light passing through a rectangular glass slab: **1 M**



A P.

B Q.

C R.

D S.

Q87. For two statements are given — One labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1 M**

Assertion (A): The rate of breathing in aquatic organisms is much faster than in terrestrial organisms.

Reason (R): The amount of oxygen dissolved in water is very high as compared to the amount of oxygen in air.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

D Assertion (A) is false, but Reason (R) is true.

Q88. A student after viewing a prepared slide illustrates the budding in yeast in the following order which is not correct: **1 M**



The correct order should be:

A b, c, d, e, a

B b, e, d, c, a

C b, d, e, c, a

D b, d, c, e, a

Q89. In a nerve cell, the site where the electrical impulse is converted into a chemical signal is known as: **1 M**

A Axon

B Dendrites

C Neuromuscular junction

D Cell body

Q90. When you add about 2 ml of acetic acid to a test tube containing an equal amount of distilled water and leave the test tube to settle after shaking its contents, then after about 5 minutes what will you observe in the test tube: **1 M**

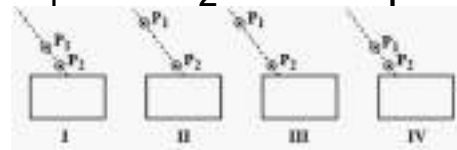
- A** A very blurred image on the wall opposite to the mirror.
C No image as the screen has been removed.

- B** An erect and magnified image of the tree in the mirror.
D A highly diminished inverted image of the tree at the focus of the mirror.

Q99. While performing the experiment on tracing the path of a ray of light through a rectangular glass slab, in which of the following experimental set-ups is a student likely to get best results?

1 M

P_1 and P_2 are the positions of pins fixed by him.



- A** I **B** II **C** III **D** IV

Q100. Iron nails were dipped in an aqueous solution of copper sulphate. After about 30 minutes, it was observed that the colour of the solution changed from:

1 M

- A** Colourless to light green. **B** Blue to light green.
C Blue to colourless. **D** Green to blue.

Q101. Bronze is an alloy of:

1 M

- A** Copper and Zinc **B** Aluminium and Tin **C** Copper, Tin and Zinc **D** Copper and Tin

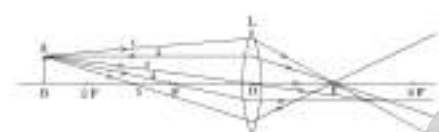
Q102. To show that zinc is a more active metal than copper, the correct procedure is to:

1 M

- A** Add dilute nitric acid on strips of both the metals. **B** Observe transmission of heat through strips of zinc and copper.
C Prepare solution of zinc sulphate and hang strip of copper into it. **D** Prepare a solution of copper sulphate and hang strip of zinc into it.

Q103. A student is using a convex lens of focal length 18 cm to study the image formation by it for the various positions of the object. He observes that when he places the object at 27 cm, the location of the image is at 54 cm on the other side of the lens. Identify from the following diagram the three rays that are obeying the laws of refraction and may be used to draw the corresponding ray diagram.

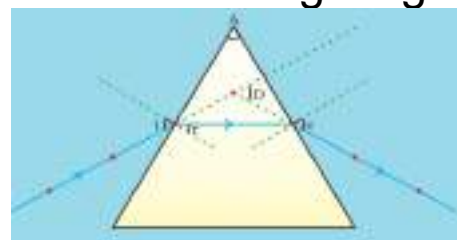
1 M



- A** 1, 2 and 4 **B** 1, 3 and 5 **C** 2, 4 and 5 **D** 2, 3 and 4

Q104. In the following diagram the correctly marked angles are:

1 M



- A** $\angle A$ and $\angle e$ **B** $\angle i$, $\angle A$ and $\angle D$
C $\angle A$, $\angle r$ and $\angle e$ **D** $\angle A$, $\angle r$ and $\angle D$

Q105. The following vegetables are kept in a basket:

1 M

Potato, Tomato, Radish, Brinjal, Carrot, Bottle-gourd.
 Which two of these vegetables correctly represent the homologous structures?

- A** Carrot and Tomato. **B** Potato and Brinjal.
C Radish and Carrot. **D** Radish and Bottle-gourd.

Q106. Select from the following the best set-up for tracing the path of a ray of light through a rectangular glass slab:

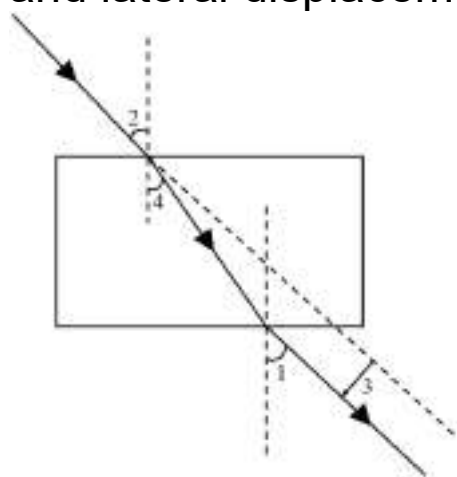
1 M



Q107. During vigorous exercise, the occurrence of cramps in the outer muscles of an athlete is due to the conversion of pyruvate to: 1 Mark

- A** Glucose **B** Ethanol **C** Lactic acid **D** Lactose

Q108. The correct sequencing of angle of incidence, angle of emergence, angle of refraction and lateral displacement shown in the following diagram by digits 1, 2, 3 and 4 is: 1 M



- A** 2, 4, 1, 3 **B** 2, 1, 4, 3 **C** 1, 2, 4, 3 **D** 2, 1, 3, 4

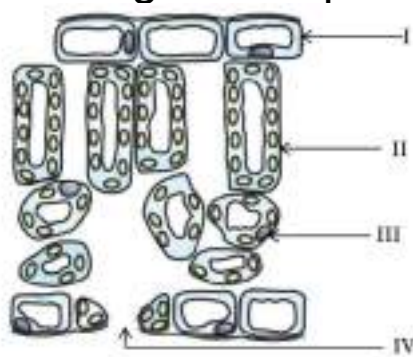
Q109. Consider the following two statements: 1 M

1. The trait that expresses itself in F_1 generation.
2. The trait that keeps on passing from one generation to another.

The appropriate terms for the statements (i) and (ii) respectively are:

- A** Recessive trait, Dominant trait. **B** Dominant trait, Recessive trait.
C Dominant trait, Inherited trait. **D** Recessive trait, Inherited trait.

Q110. In the following diagram, identify the cells through which massive amounts of gaseous exchange takes place for photosynthesis: 1 M



- A** I **B** IV **C** III **D** II

Q111. Among the following, the metal with lowest density is: 1 M

- A** Lithium **B** Lead **C** Magnesium **D** Aluminium

Q112. A student very cautiously traces the path of a ray through a glass slab for different values of the angle of incidence ($\angle i$). He then measures the corresponding values of the angle of refraction ($\angle r$) and the angle of emergence ($\angle e$) for every value of the angle of incidence. On analysing these measurements of angles, his conclusion would be 1 M

- A** $\angle i > \angle r > \angle e$ **B** $\angle i = \angle e > \angle r$
C $\angle i < \angle r < \angle e$ **D** $\angle i = \angle e < \angle r$

Q113. Select the correct statements for the process of budding in yeast: 1 M

1. A bud arises from a particular region on a parent body.
2. A parent cell divides into two daughter cells, here the parental identity is lost.
3. Before detaching from the parent body a bud may form another bud.
4. A bud when detaches from the parent body grows into a new individual.

- A** I, II and III **B** II, III and IV **C** III, IV and I **D** IV, I and II

Q114. An electric iron of 1500 W, 200 V and a flash light of 500 W, 200 V are used in homes. The rating of fuse to be used should be. 1 M

- A** 5A **B** 10A **C** 15A **D** 20A

Q115. A student while observing an embryo of a gram seed listed various parts of the embryo as listed below:
Testa, Micropyle, Cotyledon, Tegmen, Plumule, Radicle. On examining the list the teacher commented that only three parts are correct. Select these three correct parts:

1 Mark

- A** Cotyledon, Testa, Plumule. **B** Cotyledon, Plumule, Radicle.
C Cotyledon, Tegmen, Radicle. **D** Cotyledon, Micropyle, Plumule.

Q116. Plants which bear unisexual flowers are:

1 M

- A** Mustard and Papaya. **B** Hibiscus and Watermelon.
C Mustard and Hibiscus. **D** Watermelon and Papaya.

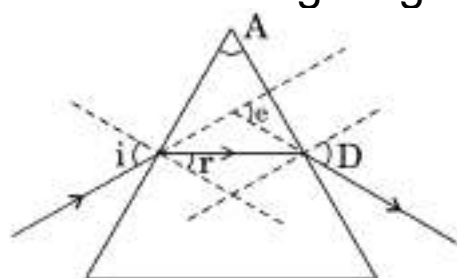
Q117. In an experiment to study the properties of acetic acid a student takes about 2 mL of acetic acid in a dry test tube. He adds about 2 mL of water to it and shakes the test tube well. He is likely to observe that:

1 M

- A** The acetic acid dissolves readily in water. **B** The solution becomes light orange.
C Water floats over the surface of acetic acid. **D** Acetic acid floats over the surface of water.

Q118. In the following diagram, the correctly marked angles are:

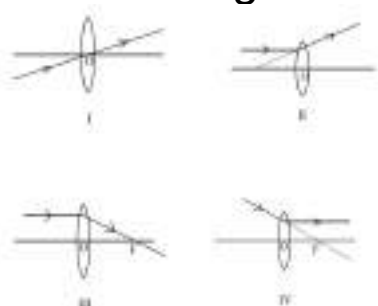
1 M



- A** All **B** Only $\angle i$ and $\angle A$
C $\angle i$, $\angle r$ and $\angle A$ **D** $\angle i$, $\angle A$ and $\angle D$

Q119. A student has obtained a magnified image of a flame on a screen using a convex lens. To draw the corresponding ray diagram, to show the image formation, which of the following two rays whose paths after refraction are shown he should select?

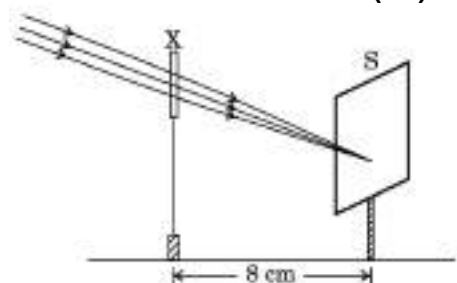
1 M



- A** I and II **B** II and III **C** III and IV **D** I and III

Q120. A student used a device (X) to obtain/focus the image of a well illuminated distant building on a screen (S) as shown below in the diagram. Select the correct statement about the device (X).

1 M



- A** This device is a concave lens of focal length 8 cm. **B** This device is a convex mirror of focal length 8 cm.
C This device is a convex lens of focal length 4 cm. **D** This device is a convex lens of focal length 8 cm.

Q121. A student takes 2 mL acetic acid in a dry test tube and adds a pinch of sodium hydrogen carbonate to it. He makes the following observations:

1 M

1. A colorless and odourless gas evolves with a brisk effervescence.
2. The gas turns lime water milky when passed through it.
3. The gas burns with an explosion when a burning splinter is brought near it.

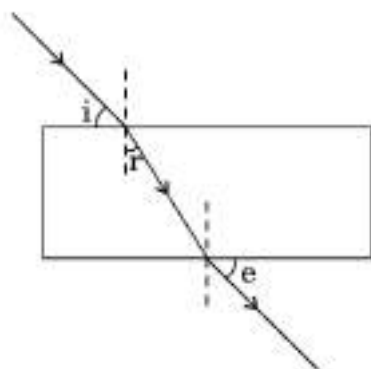
4. The gas extinguishes the burning splinter that is brought near it.
The correct observations are:

- A** I, II and III **B** II, III and IV **C** III, IV and I **D** IV, I and II

Q122. Select a pair of olfactory indicators from the following: 1 M

- A** Clove oil and vanilla essence. **B** Onion and turmeric.
C Clove oil and litmus solution. **D** Vanilla and methyl orange.

Q123. A student traces the path of a ray of light passing through a rectangular glass slab and marks the angle of incidence i , angle of refraction r and angle of emergence e , as shown. 1 M



The correctly marked angle(s) is/ are:

- A** $\angle i$ only. **B** $\angle e$ only.
C $\angle r$ only. **D** $\angle i$ and $\angle e$.

Q124. Assertion (A): Carbon has a strong tendency to either lose or gain electrons to attain noble gas configuration. 1 M

Reason (R): Carbon has four electrons in its outermost shell and has the tendency to share electrons with carbon or other elements.

- A** Both (A) and (R) are true and (R) is correct explanation of the assertion (A). **B** Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
C (A) is true, but (R) is false. **D** (A) is false, but (R) is true.

Q125. The colour of raisins as used in the experiment, 'to determine the percentage of water absorbed by raisins' was. 1 M

- A** White. **B** Yellow. **C** Dark brown. **D** Pink.

Q126. When sodium hydrogen carbonate is added to ethanoic acid a gas evolves. Consider the following statements about the gas evolved? 1 M

1. It turns lime water milky.
2. It is evolved with a brisk effervescence.
3. It has a smell of burning sulphur.
4. It is also a by-product of respiration.

The correct statements are:

- A** (A) and (B) only. **B** (B) and (D) only. **C** (A), (C) and (D). **D** (A), (B) and (D).

Q127. To determine the percentage of water absorbed by raisins, raisins are soaked in water for: 1 M

- A** 30 seconds. **B** 10 minutes. **C** 2 to 3 hours. **D** 24 hours.

Q128. To determine the focal length of a convex lens by obtaining a sharp image of a distant object, the following steps were suggested which are not in proper sequence: 1 M

1. Hold the lens between the object and the screen.
2. Adjust the position of the lens to form sharp image.
3. Select a suitable distant object.
4. Measure the distance between the lens and the screen.

The correct sequence of steps to determine the focal length of the lens is:

- A** III, I, II, IV **B** III, I, IV, II **C** III, IV, II, I **D** I, II, III, IV

Q180. While tracing the path of a ray of light passing through a rectangular glass slab student tabulated his observations given below: 1 Mark

S. No.	$\angle i$	$\angle r$	$\angle e$
I	60^0	40^0	61^0
II	50^0	36^0	51^0
III	40^0	28^0	39^0
IV	30^0	20^0	31^0

The correct observation is:

- A** I **B** II **C** III **D** IV

Q181. Vapours of acetic acid smell: 1 M

- A** Pungent like vinegar. **B** Sweet like rose.
C Suffocating like sulphur dioxide. **D** Odourless like water.

Q182. You are asked by your teacher to study the different parts of an embryo of a gram seed. Given below are the steps to be followed for the experiment. 1 M

1. Soak the gram seeds in plain water and keep them over night.
2. Cut open a soaked seed and observe its different parts.
3. Take some dry gram seeds in a petri dish.
4. Drain the excess water.
5. Cover the soaked seed with a wet cotton cloth and leave them for a day.

The correct sequence of these steps is:

- A** III, I, V, IV, II **B** III, I, II, IV, V **C** III, IV, V, I, II **D** III, I, IV, V, II

Q183. The Reni village of Garhwal is famous for: 1 M

- A** Monocultures of pine, teak and eucalyptus. **B** Chipko Movement.
C Extensive biodiversity. **D** Participation of local people in efficient management of forests.

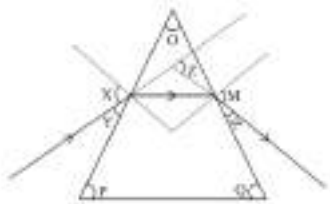
Q184. Rahim recorded the following sets of observations while tracing the path of ray of light passing through a rectangular glass slab for different angles of incidence. 1 M

S. No.	Angle of incidence	Angle of refraction	Angle of emergence
I	45^0	41^0	45^0
II	40^0	38^0	38^0
III	45^0	41^0	40^0
IV	41^0	45^0	41^0

The correct observation is recorded at serial number:

- A** I **B** II **C** III **D** IV

Q185. The path of a ray of light passing through a glass prism is shown below: 1 M



In this diagram the angle of prism, angle of incidence, angle of emergence and angle of deviation respectively have been represented by:

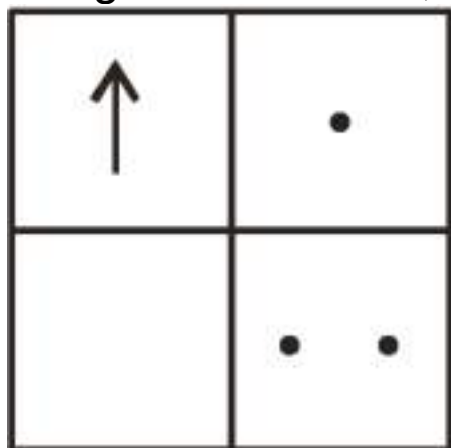
- A** O, Y, Z and N. **B** P, Y, M and Z. **C** O, X, M and Z. **D** P, X, Z and N.

Q186. Dry raisins were soaked in water for 2 hours, to determine the percentage of water absorbed by raisins. Before final weighing of swollen raisins, the extra water left on the surface of soaked raisins was removed by: 1 M

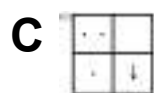
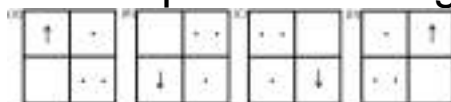
- A** Gently rubbing with cotton cloth **B** Hot air blower

Q194. If you focus the image of a distant object, whose shape is given below, on a screen using a convex lens,

1 Mark



the shape of the image of this object on the screen would be:



Q195. On adding acetic acid to sodium hydrogen carbonate in a test tube, a student observes:

1 M

- A** No reaction. **B** A colourless gas with pungent smell.
C Bubbles of a colourless and odourless gas. **D** A strong smell of vinegar.

Q196. The chemical mostly used in the preparation of most of the soaps we use is.

1 M

- A** Sodium chloride. **B** Potassium hydroxide. **C** Sodium hydroxide. **D** Potassium chloride.

Q197. Opening and closing of stomata is due to:

1 M

- A** High pressure of gases inside the cells. **B** Movement of water in and out of the guard cells.
C Stimulus of light in the guard cells. **D** Diffusion of CO_2 in and out of the guard cells.

Q198. A metal 'X' is used in thermite process. When X is burnt in air it gives an amphoteric oxide Y. 'X' and Y' are respectively.

1 M

- A** Fe and Fe_2O_3 **B** Al and Al_2O_3 **C** Fe and Fe_3O_4 **D** Al and Al_3O_4

Q199. Select the correct observation about dilute solution of acetic acid:

1 M

- A** It smells like rotten egg and turns blue litmus red. **B** It smells like vinegar and turns red litmus blue.
C It smells like rotten egg and turns red litmus blue. **D** It smells like vinegar and turns blue litmus red.

Q200. If four identical resistors, of resistance 8 ohm, are first connected in series so as to give an effective resistance R_s , and then connected in parallel so as to give an effective resistance R_p , then the ratio $\frac{R_s}{R_p}$ is:

1 M

- A** 32 **B** 2 **C** 0.5 **D** 16

Q201. Select the INCORRECT match (between the plant and its vegetative part) from the following:

1 M

- A** Bryophyllum, leaf **B** Potato, stem **C** Money-plant, stem **D** Rose, root

Q202. An organism which breaks down the food material outside the body and then absorbs it is:

1 M

- A** A plant parasite, Cuscuta **B** An animal parasite, Tapeworm
C A bacteria, Rhizobium **D** A fungi, Rhizopus

