

KENDRIYA VIDYALAYA, PANISAGAR
AUTUMN HOLIDAY HOMEWORK
CLASS XI
SUBJECT- BIOLOGY

- Q1. Write three processes which take place in interphase.
- Q2. Enumerate the significance of mitosis.
- Q3. List down the differences between mitosis and meiosis.
- Q4. What are homologous chromosomes? What happens to homologous chromosomes during meiosis.
- Q5. What will be the DNA content of a cell at G₁, after S and G₂ if the content after M phase is 2C?
- Q6. Differentiate between nucleotides and nucleosides.
- Q7. Enumerate differences between DNA and RNA.
- Q8. Amino acids exist as zwitterions. Give its structure. Why is it formed?
- Q9. Describe the lock and key hypothesis of enzyme action.
- Q10. Explain briefly the four levels of protein structure.

EXERCISE 9.1

1. Draw a quadrilateral in the Cartesian plane, whose vertices are $(-4, 5)$, $(0, 7)$, $(5, -5)$ and $(-4, -2)$. Also, find its area.
2. The base of an equilateral triangle with side $2a$ lies along the y -axis such that the mid-point of the base is at the origin. Find vertices of the triangle.

Rationalised 2023-24

STRAIGHT LINES 159

3. Find the distance between $P(x_1, y_1)$ and $Q(x_2, y_2)$ when : (i) PQ is parallel to the y -axis, (ii) PQ is parallel to the x -axis.
4. Find a point on the x -axis, which is equidistant from the points $(7, 6)$ and $(3, 4)$.
5. Find the slope of a line, which passes through the origin, and the mid-point of the line segment joining the points $P(0, -4)$ and $B(8, 0)$.
6. Without using the Pythagoras theorem, show that the points $(4, 4)$, $(3, 5)$ and $(-1, -1)$ are the vertices of a right angled triangle.
7. Find the slope of the line, which makes an angle of 30° with the positive direction of y -axis measured anticlockwise.
8. Without using distance formula, show that points $(-2, -1)$, $(4, 0)$, $(3, 3)$ and $(-3, 2)$ are the vertices of a parallelogram.
9. Find the angle between the x -axis and the line joining the points $(3, -1)$ and $(4, -2)$.
10. The slope of a line is double of the slope of another line. If tangent of the angle between them is $\frac{1}{3}$, find the slopes of the lines.
11. A line passes through (x_1, y_1) and (h, k) . If slope of the line is m , show that $k - y_1 = m(h - x_1)$.

In Exercises 1 to 8, find the equation of the line which satisfy the given conditions:

1. Write the equations for the x - and y -axes.
2. Passing through the point $(-4, 3)$ with slope $\frac{1}{2}$.
3. Passing through $(0, 0)$ with slope m .
4. Passing through $(2, 2\sqrt{3})$ and inclined with the x -axis at an angle of 75° .
5. Intersecting the x -axis at a distance of 3 units to the left of origin with slope -2 .
6. Intersecting the y -axis at a distance of 2 units above the origin and making an angle of 30° with positive direction of the x -axis.

7. Passing through the points $(-1, 1)$ and $(2, -4)$.
8. The vertices of ΔPQR are $P(2, 1)$, $Q(-2, 3)$ and $R(4, 5)$. Find equation of the median through the vertex R .
9. Find the equation of the line passing through $(-3, 5)$ and perpendicular to the line through the points $(2, 5)$ and $(-3, 6)$.
10. A line perpendicular to the line segment joining the points $(1, 0)$ and $(2, 3)$ divides it in the ratio $1 : n$. Find the equation of the line.
11. Find the equation of a line that cuts off equal intercepts on the coordinate axes and passes through the point $(2, 3)$.
12. Find equation of the line passing through the point $(2, 2)$ and cutting off intercepts on the axes whose sum is 9.
13. Find equation of the line through the point $(0, 2)$ making an angle $\frac{2\pi}{3}$ with the positive x -axis. Also, find the equation of line parallel to it and crossing the y -axis at a distance of 2 units below the origin.
14. The perpendicular from the origin to a line meets it at the point $(-2, 9)$, find the equation of the line.
15. The length L (in centimetre) of a copper rod is a linear function of its Celsius temperature C . In an experiment, if $L = 124.942$ when $C = 20$ and $L = 125.134$ when $C = 110$, express L in terms of C .
16. The owner of a milk store finds that, he can sell 980 litres of milk each week at Rs 14/litre and 1220 litres of milk each week at Rs 16/litre. Assuming a linear relationship between selling price and demand, how many litres could he sell weekly at Rs 17/litre?
17. $P(a, b)$ is the mid-point of a line segment between axes. Show that equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$.
18. Point $R(h, k)$ divides a line segment between the axes in the ratio $1 : 2$. Find equation of the line.
19. By using the concept of equation of a line, prove that the three points $(3, 0)$, $(-2, -2)$ and $(8, 2)$ are collinear.

AUTUMN HOLIDAY HOMEWORK

CLASS –XI

SUBJECT- COMPUTER SCIENCE

- 1. Write 20 programs of Python in your Practical File.**

[Note – Write all questions in your practical file & each program in separate pages & make front page and Contents .]

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- 6.1** Give the location of the centre of mass of a (i) sphere, (ii) cylinder, (iii) ring, and (iv) cube, each of uniform mass density. Does the centre of mass of a body necessarily lie inside the body ?
- 6.2** In the HCl molecule, the separation between the nuclei of the two atoms is about 1.27 \AA ($1 \text{ \AA} = 10^{-10} \text{ m}$). Find the approximate location of the CM of the molecule, given that a chlorine atom is about 35.5 times as massive as a hydrogen atom and nearly all the mass of an atom is concentrated in its nucleus.
- 6.3** A child sits stationary at one end of a long trolley moving uniformly with a speed V on a smooth horizontal floor. If the child gets up and runs about on the trolley in any manner, what is the speed of the CM of the (trolley + child) system ?
- 6.4** Show that the area of the triangle contained between the vectors \mathbf{a} and \mathbf{b} is one half of the magnitude of $\mathbf{a} \times \mathbf{b}$.
- 6.5** Show that $\mathbf{a} \cdot (\mathbf{b} \times \mathbf{c})$ is equal in magnitude to the volume of the parallelepiped formed on the three vectors, \mathbf{a} , \mathbf{b} and \mathbf{c} .
- 6.6** Find the components along the x , y , z axes of the angular momentum \mathbf{l} of a particle, whose position vector is \mathbf{r} with components x , y , z and momentum is \mathbf{p} with components p_x , p_y and p_z . Show that if the particle moves only in the x - y plane the angular momentum has only a z -component.
- 6.7** Two particles, each of mass m and speed u , travel in opposite directions along parallel