**KENDRIYA VIDYALAYA, PANISAGAR**
AUTUMN HOLIDAY HOMEWORK
CLASS XII
SUBJECT- BIOLOGY

1. (a) A recombinant vector with a gene of interest inserted within the gene of α-galactosidase enzyme is introduced into a bacterium. Explain the method that would help in selection of recombinant colonies from non-recombinant colonies.
    (b) Why is this method of selection referred to as insertional inactivation?

2. Study the diagram given below and answer the following questions.
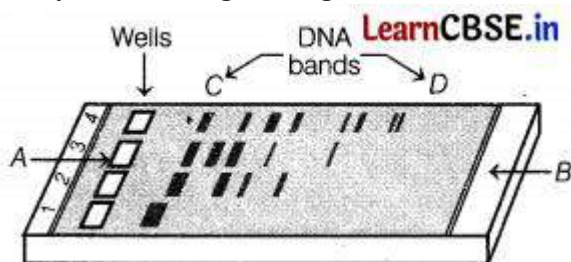
    (i) Why have DNA fragments in band D moved farther away in comparison to those in band C?
    (ii) Identify the anode end in the diagram.
    (iii) How are these DNA fragments visualised?

3. (i) Illustrate the recognition sequence of Eco RI and mention what such sequences are called?
    (ii) How does restriction endonuclease act on a DNA molecule?

4. How does p-galactosidase coding sequence act as a selectable marker? Why is it a preferred selectable marker to antibiotic resistance genes? Explain.

5. Prepare a flow chart information of recombinant DNA by the action of restriction endonuclease enzyme Eco RI.

6. Mention the chemical change that proinsulin undergoes, to be able to act as mature insulin.

7. How does recombinant DNA technology help in detecting the presence of mutant gene in cancer patients?

8. How has the use of Agrobacterium as vectors helped in controlling *Meloidogyne incognita* infestation in tobacco plants? Explain in correct sequence.

9. Why do lepidopterans die when they feed on Bt cotton plant? Explain how does it happen.

10. What is GMO? List any five possible advantages of a GMO to a farmer.

In each of the Exercises 1 to 10, show that the given differential equation is homogeneous and solve each of them.

1. $(x^2 + xy) \, dy = (x^2 + y^2) \, dx$

2. $y' = \dfrac{x+y}{x}$

3. $(x - y) \, dy - (x + y) \, dx = 0$

4. $(x^2 - y^2) \, dx + 2xy \, dy = 0$

5. $x^2 \dfrac{dy}{dx} = x^2 - 2y^2 + xy$

6. $x \, dy - y \, dx = \sqrt{x^2 + y^2} \, dx$

7. $\left\{ x\cos\left(\dfrac{y}{x}\right) + y\sin\left(\dfrac{y}{x}\right) \right\} y \, dx = \left\{ y\sin\left(\dfrac{y}{x}\right) - x\cos\left(\dfrac{y}{x}\right) \right\} x \, dy$

8. $x\dfrac{dy}{dx} - y + x\sin\left(\dfrac{y}{x}\right) = 0$

9. $y \, dx + x\log\left(\dfrac{y}{x}\right) dy - 2x \, dy = 0$

10. $\left(1 + e^{\frac{x}{y}} \right) dx + e^{\frac{x}{y}} \left(1 - \dfrac{x}{y} \right) dy = 0$

For each of the differential equations in Exercises from 11 to 15, find the particular solution satisfying the given condition:

11. $(x + y) \, dy + (x - y) \, dx = 0$; $y = 1$ when $x = 1$

12. $x^2 \, dy + (xy + y^2) \, dx = 0$; $y = 1$ when $x = 1$

13. $\left[x\sin^2\left(\dfrac{y}{x}\right) - y \right] dx + x \, dy = 0$; $y = \dfrac{\pi}{4}$ when $x = 1$

14. $\dfrac{dy}{dx} - \dfrac{y}{x} + \csc\left(\dfrac{y}{x}\right) = 0$; $y = 0$ when $x = 1$

15. $2xy + y^2 - 2x^2 \dfrac{dy}{dx} = 0$; $y = 2$ when $x = 1$

16. A homogeneous differential equation of the from $\dfrac{dx}{dy} = h\left(\dfrac{x}{y}\right)$ can be solved by making the substitution.

    (A) $y = vx$ (B) $v = yx$ (C) $x = vy$ (D) $x = v$

1. Class 12 - Exercise of Haloalkane and Halo arene chapter

AUTUMN HOLIDAY HOMEWORK

CLASS –XII

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 .]

HOME – WORK FOR NEXT POOJA VACATION

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9.18 The image of a small electric bulb fixed on the wall of a room is to be obtained on the opposite wall 3 m away by means of a large convex lens. What is the maximum possible focal length of the lens required for the purpose?

9.19 A screen is placed 90 cm from an object. The image of the object on the screen is formed by a convex lens at two different locations separated by 20 cm. Determine the focal length of the lens.

9.20 (a) Determine the 'effective focal length' of the combination of the two lenses in Exercise 9.10, if they are placed 8.0cm apart with their principal axes coincident. Does the answer depend on which side of the combination a beam of parallel light is incident? Is the notion of effective focal length of this system useful at all?

(b) An object 1.5 cm in size is placed on the side of the convex lens in the arrangement (a) above. The distance between the object and the convex lens is 40 cm. Determine the magnification produced by the two-lens system, and the size of the image.

9.21 At what angle should a ray of light be incident on the face of a prism of refracting angle 60° so that it just suffers total internal reflection at the other face? The refractive index of the material of the prism is 1.524.

9.22 A card sheet divided into squares each of size 1 mm² is being viewed at a distance of 9 cm through a magnifying glass (a converging lens of focal length 9 cm) held close to the eye.

(a) What is the magnification produced by the lens? How much is the area of each square in the virtual image?

(b) What is the angular magnification (magnifying power) of the lens?

(c) Is the magnification in (a) equal to the magnifying power in (b)? Explain.