



4. What is meant by reverse osmosis?
5. Explain Raoult's law and Henry's law. How Raoult's law is related to Henry's Law.
6. Write difference between ideal and non-ideal solution.

### SUBJECT: MATHEMATICS

1. Let S be the set of all real numbers and let R be a relation in S, defined by  $R = \{(a, b) : a \leq b^3\}$ . Show that it does not satisfy any of reflexivity, symmetry and transitivity.

2. Let  $A = \mathbb{R} - \{3\}$  and  $B = \mathbb{R} - \{1\}$ . Consider the function  $f: A \rightarrow B$  defined by  $f(x) = \frac{x-2}{x-3}$ . Show that f is one-one and onto.

3. Find the domain of  $\sin^{-1}(x^2 - 4)$

4. Find the value of  $\sin^{-1}\left(\cos\left(\frac{33\pi}{5}\right)\right)$

5. If  $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 2 & 1 \end{bmatrix}$ , then show that  $A^3 - 23A - 40I = O$

6. Prove that  $\tan^{-1}\left(\frac{63}{16}\right) =$

$\sin^{-1}\left(\frac{5}{13}\right) + \cos^{-1}\left(\frac{3}{5}\right)$

7. The sum of three numbers is 6. If we multiply third number by 3 and add second number to it, we get 11. By adding first and third numbers, we get double of the second number. Represent it algebraically and find the numbers using matrix method.

8. If  $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$ , Find  $A^{-1}$ . Using  $A^{-1}$  solve the system of the equations

$$2x - 3y + 5z = 11$$

$$3x + 2y - 4z = -5$$

$$x + y - 2z = -3$$

### SUBJECT – BIOLOGY

1. Draw a labelled diagram of an anther lobe at microspore mother cell stage. Mention the role of different wall layers of anther.
2. What are the Assisted Reproductive Techniques practised to help infertile couple? Describe any three techniques.
3. Describe the role of pituitary and ovarian hormones during the menstrual cycle in a human female.
4. State difference between spermatogenesis and oogenesis.
5. Draw a diagram of mature embryo sac of an angiosperm and label the following in it:-(i) filiform apparatus (ii) Synergids (iii) Central cell (iv) Egg cell (v) Polar nuclei (vi) Antipodal cell

### SUBJECT -PHYSICS

EXERCISE -1 QN. 2.1 to 2.15

ग्रीष्मावकाश दिनांक 25 मई 2024 से 19 जून 2024 तक है, पुनः विद्यालय 20 जून 2024 दिन गुरुवार को अपने निधारित समय पर खुलेगा।