LEARNING REDEFINED

SARASWATI DEVI INTERNATIONAL SCHOOL

BANKURA

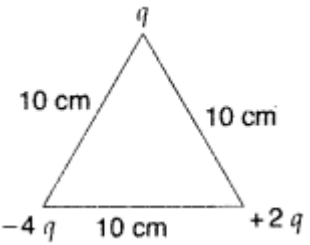
Class : XII SCIENCE

Paubagan, Damodarpur, Bankura, West Bengal
Web.: www.sdisbankura.in Mail : sdisbankura@gmail.com

PHYSICS:

1. What is the geometrical shape of equipotential surface due to a single isolated charge?
2. Why do the electric field lines never cross each other?
3. In which orientation, a dipole placed in a uniform electric field is in (i) stable, (ii) unstable equilibrium?
4. Draw a graph to show the variation of E with perpendicular distance r from the line of charge.
5. An electric dipole of length 4 cm, when placed with its axis making an angle of 60° with a uniform electric field, experiences a torque of 4√3 Nm. Calculate the potential energy of the dipole, if it has charge ± 8 nC
6. A charge is distributed uniformly over a ring of radius 'a'. Obtain an expression for the electric intensity E at a point on the axis of the ring. Hence show that for points at large distances from the ring, it behaves like a point charge.
7. Why must electrostatic field be normal to the surface at every point of a charged conductor?
8. Draw a plot showing variation of electric field with distance from the centre of a solid conducting sphere of radius R, having a charge of +Q on its surface.
9. A point charge Q is placed at point O as shown in the figure. Is the potential difference $V_A - V_B$ positive, negative or zero, if Q is
   (i) positive
   (ii) negative?
10. A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 V. What is the potential at the centre of the sphere?
11. Two point charges, $q_1 = 10 \times 10^{-8}C$, $q_2 = -2 \times 10^{-8}C$ are seperated by a distance of 60 cm in air.
    (i) Find at what distance from the 1^{st} charge, q_1 would the electric potential be zero.
    (ii) Also calculate the electrostatic potential energy of the system.
12. Two point charges 4Q, Q are separated by lm in air. At what point on the line joining the charges is the electric field intensity zero?
    Also calculate the electrostatic potential energy of the system of charges, taking the value of charge, $Q = 2 \times 10^{-7}C$
13. Two point charges 20 x 10-6 C and -4 X 10-6 C are separated by a distance of 50 cm in air.
    (i) Find the point on the line joining the charges, where the electric potential is zero.
    (ii) Also find the electrostatic potential energy of the system.

14. Calculate the work done to dissociate the system of three charges placed on the vertices of a triangle as shown. (Delhi 2008)



15. (i) Can two equipotential surfaces intersect each other? Give reasons.
(ii) Two charges -q and + q are located at points A (0, 0, – a) and B (0, 0, +a) respectively. How much work is done in moving a test charge from point P (7, 0, 0) to Q (-3,0,0)?

ENGLISH:

1.15 PAGES HANDWRITING
TO BE DONE IN THE HOMEWORK NOTEBOOK
2.AUTOBIOGRAPHY
WORD LIMIT- 1500-2000 WORDS
TO BE DONE IN A SPIRAL FILE USING A-4 SIZE PAPER.
TOPIC
.1.YOUR IDENTITY
2.DAILY LIFESTYLE AND VALUES INCULCATED
3.YOUR OPINION ABOUT THE PRESENT GENERATION
4.VISION OF LIFE AND.PLAN TO ACHIEVE THE SAME
5.EXPECTATION FROM TEACHERS, SCHOOL, PARENTS AND FRIENDS
6.YOUR DREAM SCHOOL.

CHEMISTRY:

1. Define the following terms :
(i) Mole fraction
(ii) Isotonic solutions
(iii) van't Hoff factor
(iv) Ideal solution
2. A 1.00 molal aqueous solution of trichloroacetic acid (CCl3COOH) is heated to its boiling point. The solution has the boiling point of 100.18°C. Determine the van't Hoff factor for trichloroacetic acid. (Kb for water = 0.512 K kg mol^{-1})
3. Define the terms, 'osmosis' and 'osmotic pressure'.

4. What is the advantage of using osmotic pressure as compared to other colligative properties for the determination of molar masses of solutes in solutions?
5. Explain why aquatic species are more comfortable in cold water rather than in warm water.
6. State Raoult's law. How is it formulated for solutions of non-volatile solutes?
7. State Henry's law and mention two of its important applications.
8. Why do gases nearly always tend to be less soluble in liquids as the temperature is raised?
9. 18g of glucose, C6H12O6 (Molar mass – 180 g mol-1) is dissolved in 1 kg of water in a sauce pan. At what temperature will this solution boil? (Kb for water = 0.52 K kg mol-1, boiling point of pure water = 373.15 K)
10. An aqueous solution of sodium chloride freezes below 273 K. Explain the lowering in freezing points of water with the help of a suitable diagram.

MATH:

SHORT ANSWER TYPE QUESTIONS (3 Marks)

1) Check the following functions for one-one and onto.

(a) $f:R\to R,\ f(x)=\dfrac{2x-3}{7}$

(b) $f:R\to R, f(x)=x^2+2$

(c) $f:R\to R, f(x)=|x+1|$

2) Prove that the Greatest integer function $f:R\to R$, given by $f(X)=[x]$, is neither one-one nor onto, where $[x]$ denotes the Greatest integer less than or equal to x

3) **Consider $y:R^+\to[4,\infty)$ given by $y=x^2+4$. Show that f is both one-one and onto, where R^+ is the set of all non-negative real numbers. Express x in terms of y.**

4) f: R → R is the function $f(x)=9x^3$

5) Find the number of all onto functions from the set {1,2,3,4,.....} to itself.

6) Let A=R-{3}and B=R-{1},consider the function $f : A \to B$ defined by

$f(x) = \frac{x-1}{x-3}$ show that f is one-one and onto and hence find f^{-1}

7) Show that the modulus function $f : R \to R$ defined by f(x) = | 2x | is neither one-one nor onto.

8) Check the function $f : R \to R$ given by $f(x) = x^3 - 6x^2 + 11x - 6$ is one-one or not.

9) Let $f : X \to Y$ and $g : Y \to Z$ be two invertible function, then show that $(gof)^{-1} = f^{-1}og^{-1}$.

10) If $f : X \to Y$ and $g : Y \to Z$ are onto functions, then show that g of $X \to Z$ is also onto.

11) If L is the set of all lines in the plane and R is the relation in L defined by R = {$(l_1, l_2) : l_1$ is parallel to l_2}. Show that the relation R is equivalence relation.

12) Show that the relation R, defined in a set A of all triangles as {$(T_1, T_2) : T_1$ is similar triangle to T_2}, is equivalence relation.

13) Show that the relation Q in R defined as Q = {(a, b) : b ≥ a}, is reflexive and transitive but not symmetric.

14) Show that the relation R in the set A = {a, b, c} given by R = {(b, c), (c, b)} is symmetric but neither reflexive nor transitive.

15) State the reason for the relation R in the set {1, 2, **3} given by R = {(1, 2), (2, 1)} not to be transitive**

7 Find the value of x such that $\begin{bmatrix}1 & x & 1\end{bmatrix}\begin{bmatrix}1 & 3 & 2\\ 2 & 5 & 1\\ 15 & 3 & 2\end{bmatrix}\begin{bmatrix}1\\ 2\\ x\end{bmatrix} = 0$

8 Prove that the product of the matrices $\begin{bmatrix}\cos^2\theta & \cos\theta\sin\theta\\ \cos\theta\sin\theta & \sin^2\theta\end{bmatrix}$ and $\begin{bmatrix}\cos^2\phi & \cos\phi\sin\phi\\ \cos\phi\sin\phi & \sin^2\phi\end{bmatrix}$ is the null matrix, when θ and ϕ differ by an odd multiple of $\frac{\pi}{2}$.

9. If $A = \begin{bmatrix}5 & 3\\ 12 & 7\end{bmatrix}$ show that $A^2 - 12A - I = 0$. Hence find A^{-1}.

10 If $A = \begin{bmatrix}2 & 3\\ 4 & 7\end{bmatrix}$ find f(A) where $f(x) = x^2 - 5x - 2$.

11. If $A = \begin{bmatrix}4 & 3\\ 2 & 5\end{bmatrix}$, find x and y such that $A^2 - xA + yI = 0$.

12. Find the matrix x so that $x\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\end{bmatrix} = \begin{bmatrix}-7 & -8 & -9\\ 2 & 4 & 6\end{bmatrix}$.

13. If $A = \begin{bmatrix}2 & 3\\ 1 & -4\end{bmatrix}$ and $B = \begin{bmatrix}1 & -2\\ -1 & 3\end{bmatrix}$ then show that $(AB)^{-1} = B^{-1}A^{-1}$.

COMPUTER SCIENCE:

Assignment:

1) Research the Project Topic in Website with Project Description also. Submit Hardcopy
on School Reopen that Day.
2) To write all Datatypes Programs with all in-build-function () in (A4 Sheet)
3) Write Python Program with using of User-define function in A4 Sheet. (6 Questions
are Down Below)

Question:

1.Write a program that prompts for a phone number of 10 digits and two dashes, with dashes after the area code and the next three numbers. For example, 017-555-1212 is a legal input. Display if the phone number entered is valid format or not and display if the phone number is valid or not (ie., contains just the digits and dash at specific places).
2. Write a program that takes any two lists L and M of the same size and adds their elements
together to form a new list N whose elements are sums of the corresponding elements in L
and M. For instance, if L=[3, 1, 4] and M=[1, 5,9], then N should equal [4, 6, 13].
3. Write a program that rotates the elements of a list so that the element at the first index
moves to the second index, the element in the second index moves to the third index, etc.,
and the element in the last index moves to the first index.
4. Write a short Python code segment that prints the longest word in a list of words.
5. Write a program that creates a list of all the integers less than 100 that are multiples of 3 or 5.
6. Define two variables first and second so that first = "Jimmy" and second = "Johny". Write a short Python code segment that swaps the values assigned to these two variables and prints the results.

BIOLOGY:

1 In which of the following mammal estrous cycle is absent:
(a) cow (b) horse (c) monkey (d) rabbit
2. Identify the incorrect statement.
a. In asexual reproduction, the offspring produced are morphologically and genetically identical to the parent
b. Zoospores are sexual reproductive structures
c. In asexual reproduction, a single parent produces offspring with or without the

formation of gametes
d. Conidia are asexual structures in Penicillium
3. Asexual reproductive structure of sponge:
(a) Gemmules (b)conidia (c)bulb (d)none of these
4. Which of the following is developed by parthenogenesis:
(a)Drones (b)queen honey bee (c)worker honey bee (d) both b and c
5. ----- is formed immediately after fertilization
(a) morula (b)blastula (c)zygote (d) foetus
6. The process which results the formation of zygote
(a) Isogamy (b) Anisogamy (c) Triple fusion (d) Syngamy
7. Which of the following is not an asexual reproductive structure?
(a) zoospores (b) pollen (c) buds (d) conidia
8. Parthenogenesis is the development of an organism directly from:
(a) Female gametes (b) Vegetative cells (c) Fertilized ovum (d)none of these
9. Which of the following organism reproduces by multiple fission?
(a) Euglena (b) Paramecium (c)Trypanosoma (d)Plasmodium
10. Which type of stem modification is seen in banana?
(a) stem tuber (b) bulb (c)corn (d) rhizome
11. Which animals have developed capacity of regeneration ?
(a) Hydra, Starfish (b) Plasmodium (c) Leech (d) Paramoecium
12. Sporulation occurs in.....
(a) Plasmodium (b) Hydra (c) Starfish (d) Spongilla
13. Which plant reproduces vegetatively by roots ?
(a) Oxalis (b) Bryophyllum (c) Onion (d) Dahlia
14. Which plant performs vegetative reproduction with the help of floral buds ?
(a) Agave (b) Bryophyllum (c) Ginger (d) Asparagus
Q1. Write briefly the role of pollination in the growth and development in an angiosperm.

Note:

- **Students must submit their holiday homework as marks will be added to your internal assessment in Term End examination.**
- **Last date of submission 13th June 2025(Friday)**

Saraswati Devi International School, Bankura, WB

Co-Educational, English Medium, Sr. Secondary School, Affiliated To CBSE, Aff No: 2430231

DATE SHEET OF PA1 EXAM , 2025-26

TIME: (09:00-10:00)	02-07-2025	03-07-2025	04-07-2025	07-07-2025	08-07-2025	09-07-2025	10-07-2025
	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday
STD-XI SCI.	COMPUTER SCIENCE	ENGLISH	MATH	BIOLOGY	CHEMISTRY	PHYSICS	PHY. EDU.
STD-XI COM	COMPUTER SCIENCE	ENGLISH	APPLIED MATHS	ECONOMICS	BST	ACCOUNTANCY	PHY. EDU.
STD-XI ARTS	COMPUTER SCIENCE	ENGLISH	HISTORY	ECONOMICS	GEOGRAPHY	POL SCI.	PHY. EDU.
STD-XII SCI.	ENGLISH	CHEMISTRY	COMPUTER SCIENCE /WEB APPLICATION	PHYSICS	BIOLOGY	MATH	PHY. EDU.
STD-XII COM	ENGLISH	BST	COMPUTER SCIENCE	APPLIED MATHS	ECONOMICS	ACCOUNTANCY	PHY. EDU.
STD-XII ARTS	ENGLISH	GEOGRAPHY	LEGAL STUDIES	POL SCI.	ECONOMICS	HISTORY	PHY. EDU.

* Exam Hours : 1hr 30minutes Full Marks = 40

* There will be regular classes after examination.

Next Regular Weekly Test (MCQ) on 10th June, Subject- English, FM-20