D.S.B. INTERNATIONAL PUBLIC SCHOOL
RISHIKESH (UTTARAKHAND)

HOLIDAY HOMEWORK (Class XII)

CHEMISTRY

Prepare a practical notebook (ruled on one side) and write the following experiments-

(a) Volumetric Experiments

(i) To prepare a standard solution of Mohr's salt and using this solution, find out the strength of given $KMnO_4$ solution.

(ii) To prepare a standard solution of Oxalic acid and using this solution, find out the strength of given $KMnO_4$ solution.

(b) Salt Analysis

(i) To analyse the given sample of salt for one acidic and one basic radical.

BIOLOGY

Making an Investigatory project helps the student to develop a scientific look and make them think analytically and logically.

Kindly complete your Investigatory project on the given topics. The project file should be at least 10 pages.

MATHEMATICS

Do any 10 Maths activities from Maths Lab manual. Activities can be done in Maths Lab Manual or loose sheets with stick file.

Worksheet based on first four chapters is attached with this file. Do all questions in Maths notebook.

REVISION WORKSHEET 1

RELATION AND FUNCTION& ITF

Q1. Let R be the relation over a set of all straight lines in a plane such that $l_1 R l_2 \Leftrightarrow l_1 \perp l_2$. Then R is

(a) symmetric relation (b) reflexive (c) transitive (d) an equivalence

Q2. If R is the largest equivalence relation on a set A and S is any relation on A, then

(a) $R \subset S$ (b) $S \subset R$ (c) $R = S$ (d) none of these

Q3. The number of possible reflexive relations on a set consisting of 3 elements is

(a) 512 (b) 64 (c) 256 (d) 128

Q4. The number of possible symmetric relations on a set consisting of 4 elements is

(a) 1024 (b) 512 (c) 32 (d) 256

Q5. In the set Z of all integers, which of the following relation R is not an equivalence relation?

(a) x R y : if $x \leq y$ (b) x R y : if $x = y$(c) x R y : if $x - y$ is an even integer d) x R y : if $x \equiv y \pmod 3$

Q6. S is a relation over the set R of all real numbers and it is given by (a, b) $\in$ S $\Leftrightarrow ab \geq 0$.

(a) Symmetric and transitive only (b) reflexive & symmetric only

(c) antisymmetric only (d) an equivalence relation

Q7. The relation R = {(1, 1), (2, 2), (3, 3)} on the set {1, 2, 3} is

(a) Symmetric only (b) reflexive only (c) an equivalence relation (d) transitive only

Q8. Let X = {1, 2, 3} and a relation R is defined in X as R = {(1, 3), (2, 2), (3, 2)}, then minimum ordered pairs which

Should be added in a relation R to make it reflexive and symmetric are

(a) {(1, 1), (2, 3), (1, 2)} (b) {(3, 3), (3, 1), (1, 2)}

(c) {(1, 1), (3, 3), (3, 1), (2, 3)} (d) {(1, 1), (3, 3), (3, 1), (1, 2)}

Q9. 4. Let A = {1, 2, 3, ……n} and B = {a, b}. Then the number of surjections from A into B is

(a) ${}^nP_2$ (b) $2^n - 2$ (c) $2^n - 1$ (d) none of these

Q10. How many one – one relation is possible in set A = {1, 2, 3}?

(a) 1 (b) 6 (c) 8 (d) 9

Q11. Consider the set A containing n elements, then the total number of injective functions from set A onto itself is/are

(a) n (b) n^n (c) $\frac{n}{2}$ (d) n!

Q12. Let X = $\{x^2 : x \in N\}$ and the function f: N $\rightarrow$ X is define by $f(x) = x^2$, $x \in N$. Then this function is

(a) injective only (b) not bijective (c) surjective only (d) bijective

Q13. Let N be the set of natural numbers and the function f: N $\rightarrow$ N be defined by f(n) = 2n + 3 for all $n \in N$. Then f is

(a) surjective (b) injective (c)bijective (d) none of these

Q14.If the set A contains 5 elements and set B containing 6 elements, then the number of one-one and onto mapping from A to B is

(a) 720 (b) 120 (c)0 (d) none of these

Q15. Which of the following functions from Z to Z is a bijective?

(a) $f(x) = x^3$ (b)g(x) = x + 2 (c) f(x) = 2x + 1 (d) $f(x) = x^2 + 1$

Q16. Let R be a relation on the set N of natural numbers defined by nRm, if n divides m, then R is

(a) reflexive & symmetric (b) transitive and symmetric (c) equivalence (d) symmetric

Q17. Let f: R $\rightarrow$ R be defined by $f(x) = \frac{1}{x}$ for all $x \in R$. Then f is

(a) one-one (b) onto (c) bijective (d) f is not defined

Q18. Let Z be the set of integers and R be a relation defined in Z such that a R b if (a – b) is divisible 5. Then number of equivalence classes are

(a) 2 (b) 3 (c)4 (d) 5

ASSERTION – REASON BASED QUESTIONS

In the following questions a statement of Assertion(A) is followed by a statement of Reason(R). Choose the correct answer out of the following choices:

(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.

Q19. Assertion(A): Let f: R $\rightarrow$ R be defined by $f(x) = x^3 + 4x - 5$ is a bijective.

Reason(R):Every odd degree polynomial has a least one real root.

Q20. (i) Assertion(A): The number of reflexive relations on a set A = {1, 2, 3, 4, 5} is 220.

Reason(R): The number of reflexive relations on set A consisting of n elements is $2^{n(n-1)}$.

(ii) Assertion(A): If n (A) =p and n (B) = q then the number of relations from Ato B is 2^{pq}.

Reason(R): A relation from A to B is a subset of A x B.

(iii) Assertion(A): A relation R ={(1,1),(1,2),(2,2),(2,3), (3,3)}defined on the setA={1,2,3} is reflexive.

Reason(R) : A relation R on the set A is reflexive if (a,a)ϵ R, a ϵA.

(iv) Assertion(A): A={1,2,3},B={4,5,6,7}, f={(1,4),(2,5),(3,6)} is a function from A to B.Then f is one-one

Reason(R): A function f is one –one distinct elements of A have distinctimages in B.

(v) Assertion(A): Consider the function f:R R defined by $f(x)=\frac{x}{x^2+1}$.Then f isone – one.

Reason(R): $f(4)=\frac{4}{17}$ and $f(\frac{1}{4})=\frac{4}{17}$.

Q21. The domain of $\cos^{-1}(3x-2)$ is

(a) $(\frac{1}{3}, 2)$ (b) $[\frac{1}{3}, 1]$ (c) [-1, 1] (d) $[\frac{1}{3}, \frac{1}{3}]$

Q22. The domain of $\sin^{-1}\sqrt{x-1}$ is

(a) [1, 2] (b) [-1, 1] (c) [0, 1] (d) none of these

Q23. The domain of $\sin^{-1}(-x^2)$ is

(a) [0, 1] (b) (0, 1) (c) [-1, 1] (d) ϕ

Q24. $\text{Sec}\{\tan^{-1}(\frac{y}{3})\}$ is equal to

(a) $\frac{\sqrt{9+y^2}}{9}$ (b) $\frac{\sqrt{9+y^2}}{3}$ (c) $\frac{3}{\sqrt{9+y^2}}$ (d) $\frac{9}{\sqrt{9+y^2}}$

Q25. The greatest and least value of $(\sin^{-1} x)^2 + (\cos^{-1}x)^2$ are respectively

(a) $\frac{\pi^2}{8}, \frac{5\pi^2}{4}$ (b) $\frac{\pi^2}{4}, \frac{5\pi^2}{8}$ (c) $\frac{5\pi^2}{4}, \frac{\pi^2}{8}$ (d) $\frac{5\pi^2}{8}, \frac{\pi^2}{4}$

Q26. The domain of $\sin^{-1}x + \cos x$ is

(a) [-1, 1] (b) $[-1, \pi + 1]$ (c) $(-\infty, \infty)$ (d) ϕ

Q27. The value of $\sin^{-1}(\sin \frac{3\pi}{5})$ is

(a) $\frac{3\pi}{5}$ (b) $\frac{2\pi}{5}$ (c) $\frac{\pi}{5}$ (d) none of these

Q28. The value of $\sin^{-1}(\cos\frac{33\pi}{5})$ is

(a) $\frac{3\pi}{5}$ (b) $-\frac{7\pi}{5}$ (c) $\frac{\pi}{10}$ (d) $-\frac{\pi}{10}$

Q29. If $\cos(\sin^{-1}\frac{2}{5} + \cos^{-1} x) = 0$, then x is equal to

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) 0 (d) 1

Q30. The value of $\cot\{\cos^{-1}(\frac{7}{25})\}$ is

(a) $\frac{24}{25}$ (b) $\frac{25}{7}$ (c) $\frac{25}{24}$ (d) $\frac{7}{24}$

Q31. If $\cos(\tan^{-1} x + \cot^{-1}\sqrt{3}) = 0$, then x is equal to

(a) $\frac{1}{\sqrt{3}}$ (b) $-\sqrt{3}$ (c) $-\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

Q32. The value of expression $\tan(\frac{1}{2}\cos^{-1}\frac{2}{\sqrt{5}})$ is

(a) $2 + \sqrt{5}$ (b) $\sqrt{5} - 2$ (c) $\frac{\sqrt{5}+2}{2}$ (d) $\sqrt{5} + 2$

Q33. If $\cos^{-1} x > \sin^{-1} x$ then

(a) $\frac{1}{\sqrt{2}} < x \leq 1$ (b) $0 \leq x < \frac{1}{\sqrt{2}}$ (c) $-1 \leq x < \frac{1}{\sqrt{2}}$ (d) $x > 0$

Q34. The value of $\sin\{2\sin^{-1}(0.6)\}$ is

(a) 0.48 (b) 0.96 (c) 1.2 (d) sin1.2

Q35. The value of $\tan(\cos^{-1}\frac{3}{5} + \tan^{-1}\frac{1}{4})$ is

(a) $\frac{19}{8}$ (b) $\frac{8}{19}$ (c) $\frac{19}{12}$ (d) $\frac{3}{4}$

Q36. The value of expression $\sin(\cot^{-1}(\cos(\tan^{-1}1))\}$ is

(a) 0 (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{\frac{2}{3}}$

Q37. If $\sin^{-1} x - \cos^{-1} x = \frac{\pi}{6}$, then x is equal to

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $-\frac{1}{2}$ (d)none of these

Q38. $\sin[\cot^{-1}\{\tan(\cos^{-1} x)\}]$ is equal to

(a) x (b)$\sqrt{1 - x^2}$ (c) $\frac{1}{x}$ (d) none of these

Q39. If $\tan^{-1}x = \frac{\pi}{10}$ for some $x \in R$, then the value of $\cot^{-1} x$ is

(a) $\frac{\pi}{5}$ (b) $\frac{2\pi}{5}$ (c) $\frac{3\pi}{5}$ (d) $\frac{4\pi}{5}$

Q40. The value of $\sec^2(\tan^{-1} 2) + \operatorname{cosec}^2(\cot^{-1} 3)$ is

(a) 5 (b) 10 (c) 15 (d) 12

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(c) A is true but R is false.

(d) A is false but R is true.

Q40. (i) ASSERTION: - If $\sin^{-1} x + \sin^{-1} y = \frac{\pi}{2}$, then $\cos^{-1}x + \cos^{-1} y = \frac{\pi}{2}$

REASON: $-\sin^{-1} x + \cos^{-1}x = \frac{\pi}{2}$

(ii) ASSERTION: - The domain of the function $f(x) = \cos^{-1}(3x + 1)$ is $[\frac{-2}{3}, 0]$

REASON: -Domain of $\cos^{-1} x$ is [-1, 1].

(iii) ASSERTION: - Range of $[\sin^{-1}x + 2\cos^{-1}x]$ is $[0, \pi]$

REASON: - Principal value branch of$\sin^{-1} x$ has range $[-\frac{\pi}{2}, \frac{\pi}{2}]$.

(iv) ASSERTION: - We can write $\sin^{-1}x = (\sin x)^{-1}$

REASON: - Any value in the range of principal value branch is called principal value of that inverse Trigonometric function.

(v) ASSERTION: - Let f: R ⟶ R be defined by f(x) = x2 + 1. Then , pre-images of 17 are ± 4.

REASON: - A function f: A ⟶ B is called a one-one function, if distinct elements of A have distinct Images in B.

Matrix and determinants

Q1. If $A = \begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$, then $A^2 - 6A$ is equal to

(b) 3I (b) -5I (c) 5I (d) none of these

Q2. If $A = \begin{bmatrix} \frac{1}{3} & 2 \\ 0 & 2x-3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$ and $AB = I_2$, then the value of x is

(a) -1 (b) 0 (c) 1 (d) 2

Q3. If A is a square matrix of order 3 and $|A| = 2$, then the value of $|AA'|$ is

(a) 4 (b) 2 (c) -2 (d) -4

Q4. If A is a non-singular square matrix of order 3 such that $A^2 = 3A$, hen the value of $|A|$ is

(b) -3 (b) 3 (c) 9 (d) 27

Q5. If $\begin{vmatrix} 2x & -1 \\ 4 & 2 \end{vmatrix} = \begin{vmatrix} 3 & 0 \\ 2 & 1 \end{vmatrix}$ then x is

(b) 3 (b) 2/3 (c) 3/2 (d) $-\frac{1}{4}$

Q6. If A and B are two matrices of order 3Xm and 3Xn respectively, and m = n, then the order of (5A – 2B)
is

(a) mX3 (b) 3X3 (c) mXn (d) 3Xn

Q7. If $A = [a_{ij}]$ is a square matrix of order 3 such that $a_{ij} = i^2 - j^2$, then A is

(a) A skew-symmetric matrix (b) a symmetric matrix
(c) a scalar matrix (d) an identity matrix

Q8. If $\begin{bmatrix} 2x+y & 4x \\ 5x-7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y-13 \\ y & x+6 \end{bmatrix}$, then the value of x + y is

(a) 4 (b) 5 (c) 6 (d) 9

Q9. If A and B are square matrices of the same order, then matrix $(AB^T - BA^T)$ is a

(a) A skew-symmetric matrix (b) a symmetric matrix

(c) null matrix (d) unit matrix

Q10. If $A = \begin{bmatrix} cos\theta & sin\theta \\ -sin\theta & cos\theta \end{bmatrix}$, then $A^2 = I$ is true for

(a) $\theta = 0$ (b) $\theta = \frac{\pi}{4}$ (c) $\theta = \frac{\pi}{2}$ (d) none of these

Q11. An n x n matrix is formed 0, 1 and -1 as its elements. The number of such matrices which are skew-matrices, is

(a) $\frac{n(n-1)}{n}$ (b) (n – 1)2 (c) $2^{\frac{n(n-1)}{n}}$ (d) $3^{\frac{n(n-1)}{n}}$

Q12. If A and B two matrices such that AB = B and BA = A, then $A^2 + B^2$ is equal to

(a) 2AB (b) 2BA (c) A + B (d) AB

Q13. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ and $A^2 - kA - I_2 = 0$, then the value of k is

(a) 4 (b) -4 (c) 8 (d) -8

Q14. If a matrix A is both symmetric and skew symmetric then A is necessarily a

(a) Diagonal matrix (b) zero square matrix

(c) square matrix (d) identity matrix

Q15. If a matrix has 6 elements, then number of possible orders of the matrix can be

(a) 2 (b) 4 (c) 3 (d) 6

Q16. If $\begin{bmatrix} 3c+6 & a-d \\ a+d & 2-3b \end{bmatrix} = \begin{bmatrix} 12 & 2 \\ -8 & -4 \end{bmatrix}$ then value of ab -cd is

(a) 4 (b) 16 (c) -4 (d) -16

Q17. If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, then $A^3 - 2A^2$ is

(a) a null matrix (b) an identity matrix (c) A (d) -A

Q18. If $A = \begin{bmatrix} 4 & x+2 \\ 2x-3 & x+2 \end{bmatrix}$ is a symmetric matrix, then x is equal to

(a) 3 (b) 5 (c) 2 (d) 4

Q19. If A is a square matrix, then AA is

(a) Skew-symmetric matrix (b) a symmetric matrix

(c) diagonal matrix (d) none of these

Q20. If A and B are symmetric matrices, then ABA is

(a) Skew-symmetric matrix (b) a symmetric matrix

(c) diagonal matrix (d) scalar matrix

Q21. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$ the value of x is

(a) 3 (b) ±3 (c) ±6 (d) 6

Q22. If A is a square matrix of order 3X3 such that $|A| = -3$, then $|-3AA'|$ equals to

(a) 243 (b) -243 (c) -27 (d) -81

Q23. If A and B are square matrices of order 3 such that AB = 6I. If $|A| = 12$, then $|B|$ is equal to

(a) $\frac{1}{2}$ (b) 2 (c) 18 (d) 54

Q24. Let A be square matrix of order 3 such that A(adj A) = 5I, where I is the identity matrix. Then, the value of $|adj\ A|$ is

(a) 8 (b) 25 (c) 12 (d) 16

Q25. A square non-singular matrix A satisfies $A^2 - A + 2I = 0$, then $A^{-1} =$

(a) I - A (b) $\frac{1}{2}$(I – A) (c) I + A (d)$\frac{1}{2}$(I + A)

Q26. If A is a singular matrix, then adj A is

(a) Non-singular (b) singular (c) symmetric (d) not define

Q27. If A = $\begin{bmatrix} a & 2 \\ 2 & a \end{bmatrix}$ and $|A|^3 = 125$, then a is

(a) ±3 (b) 5 (c) ±2 (d) 4

Q28. The area of a triangle with vertices (3, 2), (-1, 4) and (6, k) is 7 sq unit, then possible value of k is

(a) 3 (b) -4 (c) -3, 4 (d) 3, -4

Q29. Given a square matrix A of order 3X3 and such that $|A| = 12$, then the value of $|A.Adj\ A|$ is

(a) 12 (b) 144 (c) 1728 (d) 72

Q30. If A is a skew symmetric matrix of order 3X3, then value of $|A|$ is

(a) 3 (b) 0 (c) 9 (d) 27

YOGA
Practical File-1
Topics

1. Introduction Of Yoga

* Importance of Yoga

*Ashtang Yoga

*Brief history of Yoga

*Yoga Benefits

2. ASANAS

*Introduction of Asanas

*Types of Asanas

*Write about any two standing, sitting, supine, Prone and Relaxative Asanas with detail procedure, benefits and contraindications.

*Write the effects of Surya-Namaskar on Physical Health

3. PRANAYAMA

*Introduction of Pranayama

*Types of Pranayama

(Explain any three with benefits and precautions)

a. Nadi shodhan
b. Sheetli
c. Bhramari
d. Surya bhedi
e. Sheetkari
f. Ujjayi

4. MUDRA

a. Intro of Mudra
b. Explain any five Mudra
c. Benefits of Mudra

5. BANDH

a. Intro of Bandh
b. Explain types of Bandh
c. Benefits of Bandh

6. SHATKARMA

a. Intro of Shatkarma
b. Types of Shatkarma
c. Benefits of Shatkarma
d. Explain any two Shatkarma

(Draw or paste picture of Asana, Pranayam, Shatkarma, Mudra and Bandh)

Instructions- Make this project work in Science practical notebook.

(Acknowledgement, Certificate, Index)

PHYSICS

Complete your Annual Physics Investigatory Project.

1. Make a file on any topic, minimum 15 pages.
2. Complete the topic (from the syllabus) thoroughly with related diagrams.
3. Project will be checked after the summer break.