DELHI PUBLIC SCHOOL
BHILAI

(SESSION 2023-2024)

VACATION HOMEWORK

FOR

CLASS - XII

CLASS XII BIOLOGY VACATION H.W

1. Biology project for practicals
2. Experiments to be written in the file in the following order:
   (i) T.S of blastula (1st dig only)
   (ii) Pollination by different agencies (wind - maize ; Salvia - insect (dig D))
   (iii) Stages of gamete development (T.S of testis (1st dig), T.S of ovary)
   (iv) Controlled pollination (Emasculation (flower with scissor), bagging and tagging (c) last dig - flower with bag)
   (v) Disease causing organisms (Ascaris, Entamoeba, Plasmodium, Ringworm)
   (vi) Pedigree charts of genetic traits
   (vii) Meiosis in onion bud cell.

English Vacation H.W

Project Work.

Any one to be done (in 800 to 1000 words)
use A4 size paper.

1. India's Antarctica Programme.

OR.

2. Gandhi ji's contributions towards freedom struggle.

(Note - use pictures, Maps and statistics for your project)

ECONOMICS

Summer Vacation Work – 2023

XII

Q1- "At the time of independence Indian economy had been turned into a backward economy." Explain.

Q2- State any three British Policies which created hurdles in the development of modern industries in India.

Q3- Narrate the primary objectives of economic planning in India. Also discuss the concept of social justice as adopted in five year plan.

Q4- Discuss the programmes for the uplift of agriculture during the planning period.

Q5- Write short notes on following—

a) Stock and flow

b) Depreciation and Capital loss

c) Intermediate goods and final goods.

d) Gross investment and Net investment

DELHI PUBLIC SCHOOL,BHILAI,C.G.
SUMMER VACATION HOLIDAY HOMEWORK 2023-24
CLASS-XII
SUBJECT- COMPUTER SCIENCE

Revision Tour of Python

1. Write a Python program to calculate the length of a string(without using len() function).
2. Write a Python program to count the number of characters (character frequency) in a string.
Sample String: 'google.com'
Expected Result: {'g': 2, 'o': 3, 'l': 1, 'e': 1,'.': 1, 'c': 1, 'm': 1}
3. Write a Python program to get a string from a given string where all occurrences of its first char have been changed to '$', except the first char itself.
Sample String: 'restart'
Expected Result: 'resta$t'
4. Write a Python program to remove the nth index character from a nonempty string.
5. Write a Python program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically).
Sample Words: red, white, black, red, green, black
Expected Result: black, green, red, white, red
6. Write a Python program
to get a string made of its first three characters of a specified string. If the length of the string is less than 3, then return the original string.
Sample function and result:
first_three('ipy') -> ipy
first_three('python') -> pyt
7. Write a Python program to check whether a string starts with specified characters.
Note: In cryptography, a Caesar cipher, also known as Caesar's cipher, the shift cipher, Caesar's code or Caesar shift, is one of the simplest and most widely known encryption techniques. It is a type of substitution cipher in which each letter in the plaintext is replaced by a letter some fixed number of positions down the alphabet. For example, with a left shift of 3, D would be replaced by A, E would become B, and so on. The method is named after Julius Caesar, who used it in his private correspondence.
8. Write a Python program to print the floating numbers with no decimal places.
9. Write a Python program to print the index of the character in a string.
Sample string: Python Program
Expected output:
Current character P position at 0
Current character y position at 1
Current character t position at 2
10. Write a Python program to count and display the vowels of a given text.
11. Write a Python program to sum all the items in a list.
12. Write a Python program to get the largest number from a list.
13. Write a Python program to remove duplicates from a list. a = [10,20,30,20,10,50,60,40,80,50,40]
14. Write a Python function that takes two lists and returns True if they have at least one common member.
15. Write a Python program to shuffle and print a specified list.
16. Write a Python program to count the number of elements in a list within a specified range.
17. Write a Python program to generate groups of five consecutive numbers in a list.
18. Write a Python program to replace the last element in a list with another list.
Sample data: [1, 3, 5, 7, 9, 10], [2, 4, 6, 8]
Expected Output: [1, 3, 5, 7, 9, 2, 4, 6, 8]
19. Write a Python program to create a dictionary from two lists without losing duplicate values.
Sample data: ['Class-V', 'Class-VI', 'Class-VII', 'Class-VIII'], [1, 2, 2, 3]
Expected Output: defaultdict(<class 'set'>, {'Class-V':{1}, 'Class-VI':{2}, 'Class-VII':{2}, 'Class-VIII':{3}})
20. Write a Python program to iterate over dictionaries using for loops.

VACATION HOME WORK

Physics Class XII Session -*2023-24*

Prepare a project file for AISSCE 2024 Practical on any of following topics :

1. Principle of metre bridge / potentiometer and its applications.
2. Force on a moving charge in cross electric and magnetic fields and Cyclotron.
3. EMI, Faraday's laws ,ac generator.
4. EM waves.
5. Dual nature of matter and radiations.
6. Energy band diagrams and p & n types.
7. Types of diodes and their applications
8. Transformer & LCR circuits.
9. Optical instruments
10. Bohr's Model and H –spectrum.
11. Nuclear Physics

OR

any similar topic of class XII after approval of concerned teacher.

NOTE:

1. Write in A4 size sheet and one side only.
2. It should be hand written.
3. Front page ,acknowledge and Index can be computer printed.
4. Minimum 10 pages.
5. Diagrams with pencil.(images can be pasted)
6. Use cardboard file only. Plastic files NOT allowed.
7. Sample files can be seen in Physics Lab.
8. Project file should be submitted in Physics Lab by 10-07-*2023.*
9. It carries 3 marks of your annual exam.

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Date _____

Expt. No. _____ Page No. _____

VACATION HOME WORK

CLASS XII

CHEMISTRY

⇒ Prepare a project file on the topic given by your Chemistry teacher

Important :

1) It should be handwritten
2) The certificate, Preface, Acknowledgement etc can be typed.
3) Plastic sheet or spiral binding should NOT be used.
4) The project file should have relevant coloured pictures pasted for the appropriate topic.

Komal
19/04/2023

Teacher's Signature _____

MATRICES AND DETERMINANTS

CLASS- 12 APPLIED MATHEMATICS VACATION HOMEWORK

1 Find the minors and co factors of the matrices $\begin{bmatrix} 5 & 6 & 7 \\ 65 & 66 & 67 \\ 105 & 106 & 107 \end{bmatrix}, \begin{bmatrix} -2 & 5 & 8 \\ -4 & 6 & -8 \\ 1 & 0 & -2 \end{bmatrix}$

2 Evaluate using properties of determinants $\begin{bmatrix} 13 & 16 & 19 \\ 14 & 17 & 20 \\ 15 & 18 & 21 \end{bmatrix}$.

3 Let a, b, c be all positive and not all equal, show that the value of the determinant $\begin{bmatrix} a & b & c \\ b & c & a \\ c & a & b \end{bmatrix}$ is negative

4 Evaluate by using properties of determinants $\begin{bmatrix} a^2+1 & ab & ac \\ ab & b^2+1 & bc \\ ac & bc & c^2+1 \end{bmatrix}$.

5 If a, b, c are all different and if $\begin{bmatrix} a & a^2 & 1+a^3 \\ b & b^2 & 1+b^3 \\ c & c^2 & 1+c^3 \end{bmatrix} = 0$, *prove that* $abc = -1$.

6 Using properties of determinants, solve for x : $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$

7 Using properties of determinants, prove that $\begin{vmatrix} b^2c^2 & bc & b+c \\ c^2a^2 & ca & c+a \\ a^2b^2 & ab & a+b \end{vmatrix} = 0$

8 Evaluate $\begin{vmatrix} {}^xC_1 & {}^xC_2 & {}^xC_3 \\ {}^yC_1 & {}^yC_2 & {}^yC_3 \\ {}^zC_1 & {}^zC_2 & {}^zC_3 \end{vmatrix}$.

9 Show that $\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$.

10 Evaluate $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix}$.

11 Show that $\begin{vmatrix} (b+c)^2 & a^2 & a^2 \\ b^2 & (c+a)^2 & b^2 \\ c^2 & c^2 & (a+b)^2 \end{vmatrix} = 2abc(a+b+c)^3$.

MATRICES AND DETERMINANTS

CLASS- 12 APPLIED MATHEMATICS VACATION HOMEWORK

12 If a, b, c are positive and are the pth, qth and rth terms respectively of a G,P., show without expanding that $\begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix} = 0$.

13 If a + b + c = 0, solve the equation $\begin{vmatrix} a-x & c & b \\ c & b-x & a \\ b & a & c-x \end{vmatrix} = 0$.

14 If A(x, y), B(1, 2) and C(2, 1) are the vertices of a triangle of area 6 square units, show that x + y = 15 or -9.

15 Find the equation of the line joining by the points (3, 1) and (9, 3) using determinants.

16 Using determinants show that the points (a, 0), (0, b) and (x, y) are collinear if $\frac{x}{a}+\frac{y}{b}=1$.

17 Find the adjoint of the following $\begin{vmatrix} 5 & 4 & 2 \\ 6 & 8 & 0 \\ 1 & 7 & 5 \end{vmatrix}, \begin{vmatrix} -1 & 0 & 5 \\ 4 & 7 & 8 \\ 9 & 6 & 3 \end{vmatrix}, \begin{vmatrix} 5 & -2 & 4 \\ 1 & 2 & 0 \\ 1 & -7 & 4 \end{vmatrix}$.

Also verify $(\text{adj } A)^T = (\text{adj } A^T)$ in each case.

18 If $A=\begin{bmatrix} 6 & 5 \\ 7 & 6 \end{bmatrix}, show that\ A^2 - 12A + I = 0. Hence\ find\ A^{-1}$.

19 Using matrices Solve $\begin{bmatrix} 1 & -4 \\ 3 & -2 \end{bmatrix} X = \begin{bmatrix} -16 & -6 \\ 7 & 2 \end{bmatrix}$.

20 Find the matrix A satisfying the matrix equation $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$.

21 Find $(AB)^{-1}, where\ A=\begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}, B=\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$.

22 Find the inverse of the following matrices using adjoint

$a)\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix} b)\begin{bmatrix} 1 & 2 & 3 \\ -3 & 5 & 0 \\ 0 & 1 & 1 \end{bmatrix} c)\begin{bmatrix} -1 & 1 & 2 \\ 3 & -1 & 1 \\ -1 & 3 & 4 \end{bmatrix} d)\ diag\begin{bmatrix} 1 & 3 & 2 \end{bmatrix} e)\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\alpha & \sin\alpha \\ 0 & \sin\alpha & -\cos\alpha \end{bmatrix}$.

23 If $A=\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, B=\begin{bmatrix} 2 & -3 \\ 5 & 7 \end{bmatrix} find\ adj(AB)$. Also verify adj(AB) = (adj B)(adj A)

24 If A is a square matrix such that $|A| = 2, find\ the\ value\ of\ |A^3|$.

25 If A is a square matrix of order 3 and $|A| = 7, find\ the\ value\ of\ |adj\ A|$.

CLASS- 12 MATRICES AND DETERMINANTS APPLIED MATHEMATICS VACATION HOMEWORK

26 Solve the system using matrices

$a)\frac{2}{x}+\frac{3}{y}+\frac{10}{z}=4,\frac{4}{x}-\frac{6}{y}+\frac{5}{z}=1,\frac{6}{x}+\frac{9}{z}-\frac{20}{z}=2$

$b)3x-y+7z=3,2x+y+3z=5,x+4y-2z=1$

$c)x-y+z=3;2x+yz=2;-x-2y+2z=1 \text{ also find solution}$

27 If a + b + c = 0, then a root of

$$\begin{vmatrix} a-x & c & b \\ c & b-x & a \\ b & a & c-x \end{vmatrix}=0 \; is \quad i)0 \quad ii)1 \quad iii)a^2+b^2+c^2 \quad iv)none\ of\ these.$$

28 If $\begin{vmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix}=x+iy$ then i) x = 3, y = 1 ii) x = 1, y = 3 iii) x = 0, y = 0 iv) x = 0, y = 3

29 The sum of two non- integral roots of $\begin{vmatrix} x & 2 & 5 \\ 3 & x & 3 \\ 5 & 4 & x \end{vmatrix}=0 \; is$ i) 5 ii) -5 iii) -18 iv) none of these

30 If ω is the cube root of unity then find the value of $\begin{vmatrix} 1 & \omega^2 & 1+i+\omega^2 \\ -i & -1 & -1-i+\omega \\ 1-i & \omega^2-1 & -1 \end{vmatrix}$.

31 Find the value of k for which the system of equations $\begin{matrix}(k+2)x+(k+4)y=6 \\ (k+2)^2x+(k+4)^2y=36\end{matrix}$ is consistent.

32 If $A^2 = 8A + kI$ where $A=\begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ then find the value of k.

33 Construct 2 × 3 matrix whose elements are $a_{ij}=\frac{i-j}{i+j}$;

34 If $\begin{bmatrix} x-y & z \\ 2x-y & w \end{bmatrix}=\begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, then find the value of x + y.

35 Name the matrix $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 4 & 0 \end{bmatrix}$.

36 Find X and Y if X + Y = $\begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and X – Y = $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.

37 If A = $\begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ and B = $\begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$, find a matrix C such that 3A+5B+2C is a null matrix.

38 Evaluate the following $\begin{bmatrix} 1 & 2 & 3 \end{bmatrix}\begin{bmatrix} 1 & 0 & 2 \\ 2 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}\begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix}$

39 If A = $\begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$, then prove that AI = IA = A.

MATRICES AND DETERMINANTS

CLASS- 12 APPLIED MATHEMATICS VACATION HOMEWORK

40 If A is a square matrix such that $A^2 = A$, then find the value of $(I + A)^2 - 3A$.

41 If A is a square matrix such that $A^2 = I$, then find the simplified form of $(A-I)^3 + (A+I)^3 - 7A$

42 If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$, then prove that $A^3 - 6A^2 + 7A + 2I = O$, Also find A^{-1}, using this result.

43 Prove that every diagonal element of a skew symmetric matrix is zero.

44 Express $A = \begin{bmatrix} 2 & -6 & 11 \\ 9 & 7 & 2 \\ 5 & 4 & -7 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

45 For matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$ show that $A + A^T$ is symmetric and $A - A^T$ is Skew symmetric.

46 Show that $\begin{bmatrix} 0 & -2 & 3 \\ 2 & 0 & -5 \\ -3 & 5 & 0 \end{bmatrix}$ is skew-symmetric.

47 For what values of a, b, c the matrix $A = \begin{bmatrix} 0 & a & -13 \\ 2 & 0 & 11 \\ b & c & 0 \end{bmatrix}$ is skew symmetric.

48 If A is a skew symmetric matrix then A^2 is symmetric. Justify your answer.

49 For $A = \begin{bmatrix} 5 & 4 \\ 7 & 6 \end{bmatrix}$ verify $|A| = |A^T|$.

50 If A is matrix of order m × n and B is a matrix such that AB^T and BA^T are both defined, then find the order of matrix B.

51 Find inverse by elementary transformation of the following i) $\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$ ii) $\begin{bmatrix} 1 & 1 & 2 \\ 2 & 0 & 1 \\ 0 & -1 & 2 \end{bmatrix}$

52 Find the value of x if $\begin{bmatrix} 1-x & 2 & 3 \\ 0 & x & 0 \\ 0 & 0 & x \end{bmatrix}$ is singular.

53 If A is a 3 × 3 invertible matrix, then what will be the value of k if $|A^{-1}| = |A|^k$

54 If $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ verify that A(adj A) = det(A)I and find A^{-1}.

55 Solve using determinants x-y+2z=7; 3x+4y-5z = -5; 2x-y+3z = 12.

56 If $A = \begin{bmatrix} 1 & -2 & 3 \\ 1 & 4 & 1 \\ 1 & -3 & 2 \end{bmatrix}$, then find A^{-1}. Hence solve x + y + z = 3; -2x + 4y- 3z= -1; 3x +y + 2z = 6

ASSIGNMENT ON MATRICES (2023-24)

1. Construct a 2×2 matrix, A=$[a_{ij}]$whose elements are given by $a_{ij} = \frac{1}{2}|i - 3j|$

2. Write the value of $x + y + z$ if $\begin{bmatrix}1 & 0 & 0\\0 & 1 & 0\\0 & 0 & 1\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix} = \begin{bmatrix}0\\-1\\3\end{bmatrix}$

3. If $A = \begin{bmatrix}3 & -4\\2 & 3\end{bmatrix}$ find $A + A^T$, where A^T is the transpose of matrix A.

4. If matrix $\begin{bmatrix}0 & a & 3\\2 & b & -1\\c & 1 & 0\end{bmatrix}$ is a skew symmetric matrix, then find the value of a, b and c.

5. Find the value of x, if $\begin{vmatrix}2 & 4\\5 & 1\end{vmatrix} = \begin{vmatrix}2x & 4\\6 & x\end{vmatrix}$

6. If $\begin{bmatrix}2 & -3\\1 & 1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}1\\3\end{bmatrix}$, then find the values of x and y.

7. If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix.

8. Construct a 2 × 2 matrix whose elements a_{ij} are given by $\frac{|-3i+j|}{2}$

9. Without expanding , calculate the value of the determinant $\begin{vmatrix}119 & 21 & 42\\1 & 3 & 4\\17 & 3 & 6\end{vmatrix}$

10. If A is a square matrix of order 3 such that $|\text{adj } A| = 225$, find $|A'|$

11. If $A = \begin{bmatrix}2 & 3\\-1 & 2\end{bmatrix}$ and $f(x) = x^2 - 4x + 7I$, then show that $f(A) = 0$.Use this result and find A^5.

12. Find the value x such that:-

(i) $\begin{bmatrix}1 & x & 1\end{bmatrix}\begin{bmatrix}1 & 3 & 2\\2 & 5 & 1\\15 & 3 & 2\end{bmatrix}\begin{bmatrix}1\\2\\x\end{bmatrix} = 0$ (ii)) $\begin{bmatrix}x & 4 & 1\end{bmatrix}\begin{bmatrix}2 & 1 & 2\\1 & 0 & 2\\0 & 2 & -4\end{bmatrix}\begin{bmatrix}x\\4\\-1\end{bmatrix} = 0.$

13. If A is skew symmetric matrix, the show that A^2 is a symmetric matrix.

14. If A= $\begin{bmatrix}3 & 1\\-1 & 2\end{bmatrix}$, then show that $A^2 - 2A + 7I_2 = O$.

15. If A = $\begin{bmatrix}1 & 2 & 2\\2 & 1 & 2\\2 & 2 & 1\end{bmatrix}$, then prove that $A^2 - 4A - 5I = 0$.

16. Show that a matrix which is both symmetric as well as skew-symmetric, is a null matrix

17. If A = $\begin{bmatrix}2 & -3 & -5\\-1 & 4 & 5\\1 & -3 & -4\end{bmatrix}$, B = $\begin{bmatrix}2 & -2 & -4\\-1 & 3 & 4\\1 & -2 & -3\end{bmatrix}$,show that AB = A and BA = B.

18. Find a matrix A such that $\begin{bmatrix}2 & -1\\1 & 0\\-3 & 4\end{bmatrix}$A = $\begin{bmatrix}-1 & -8 & -10\\1 & -2 & -5\\9 & 22 & 15\end{bmatrix}$

19. If $\begin{bmatrix}8 & -1 & 5\\-2 & 1 & 3\end{bmatrix}$= A + $\begin{bmatrix}1 & 2 & -1\\0 & 4 & 9\end{bmatrix}$, then find the matrix A

20. A trust caring for handicapped children gets Rs. 30,000 every month from its donors. The trust spends half the funds received for medical and educational care of the children and for that it charges 2% of the spent amount

from them, and deposits the balance amount in a private bank to get the money multiplied so that in future the trust goes on functioning regularly. What percent of interest should the trust get from the bank to get a total of Rs.1, 800 every month? Use matrix method, to find the rate of interest.

21. Let $A = \begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$, then show that $A^2 - 4A + 7I = 0$. Using this result calculate A^3.

22. Show that the matrix $\begin{bmatrix} cos\alpha & sin\alpha & 0 \\ -sin\alpha & cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is the inverse of the matrix $\begin{bmatrix} cos\alpha & -sin\alpha & 0 \\ sin\alpha & cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$

23. To raise money for orphanage, students of three schools A, B and C organized an exhibition in their locality, where they sold paper bags, scrap-books and pastel sheets made by them using recycled paper, at the rate of Rs.20, Rs.15 and Rs.5 per unit respectively. School A sold 25 paper- bags, 12 scrap-books and 34pastel sheets. School B sold 22 paper - bags, 15 scrap-books and 28pastel sheets while School C sold 26 paper - bags ,18 scrap-books and 36pastel sheets. Using matrices, find the total amount raised by each school.

24. If $A=\begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$,then find the value of $A^2-3A + 2I$

25. Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

26. A diet contains 30 units of vitamin A, 40 units of vitamin B and 20 units of vitamin C. Three types of foods P Q and R are available. 1 unit of food P contains 3 units of vitamin A, 2 units of vitamin B and 1 unit of vitamin C, 1 unit of food Q contains 1 units of vitamin A, 2 units of vitamin B and 1 unit of vitamin C and 1 unit of food R contains 5 units of vitamin A, 3 units of vitamin B and 2 units of vitamin C. Represent the above situation algebraically and find the diet contains of each type food by using matrix method.

27. If $A=\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$,find A^{-1}. Using A^{-1}, solve the system of linear equations

$x - 2y = 10,\quad 2x - y - z = 8, and\ -2y + z = 7.$

28. If $A = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, find BA and use this to solve the system equations

$y + 2z = 7,\ x - y = 3, and\ 2x + 3y + 4z = 17$

ASSIGNMENT ON MATRICES (2023-24)

1. Construct a 2×2 matrix, A=$[a_{ij}]$whose elements are given by $a_{ij} = \frac{1}{2}|i - 3j|$

2. Write the value of $x + y + z$ if $\begin{bmatrix}1 & 0 & 0\\0 & 1 & 0\\0 & 0 & 1\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix} = \begin{bmatrix}0\\-1\\3\end{bmatrix}$

3. If $A = \begin{bmatrix}3 & -4\\2 & 3\end{bmatrix}$ find $A + A^T$, where A^T is the transpose of matrix A.

4. If matrix $\begin{bmatrix}0 & a & 3\\2 & b & -1\\c & 1 & 0\end{bmatrix}$ is a skew symmetric matrix, then find the value of a, b and c.

5. Find the value of x, if $\begin{vmatrix}2 & 4\\5 & 1\end{vmatrix} = \begin{vmatrix}2x & 4\\6 & x\end{vmatrix}$

6. If $\begin{bmatrix}2 & -3\\1 & 1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}1\\3\end{bmatrix}$, then find the values of x and y .

7. If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix.

8. Construct a 2×2 matrix whose elements a_{ij} are given by $\frac{|-3i+j|}{2}$

9. Without expanding , calculate the value of the determinant $\begin{vmatrix}119 & 21 & 42\\1 & 3 & 4\\17 & 3 & 6\end{vmatrix}$

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(i) $\begin{bmatrix}1 & x & 1\end{bmatrix}\begin{bmatrix}1 & 3 & 2\\2 & 5 & 1\\15 & 3 & 2\end{bmatrix}\begin{bmatrix}1\\2\\x\end{bmatrix} = 0$ (ii)) $\begin{bmatrix}x & 4 & 1\end{bmatrix}\begin{bmatrix}2 & 1 & 2\\1 & 0 & 2\\0 & 2 & -4\end{bmatrix}\begin{bmatrix}x\\4\\-1\end{bmatrix} = 0.$

13. If A is skew symmetric matrix, the show that A^2 is a symmetric matrix.

14. If A= $\begin{bmatrix}3 & 1\\-1 & 2\end{bmatrix}$, then show that $A^2 - 2A + 7I_2 = O$.

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from them, and deposits the balance amount in a private bank to get the money multiplied so that in future the trust goes on functioning regularly. What percent of interest should the trust get from the bank to get a total of Rs.1, 800 every month? Use matrix method, to find the rate of interest.

21. Let $A = \begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$, then show that $A^2 - 4A + 7I = 0$. Using this result calculate A^3.

22. Show that the matrix $\begin{bmatrix} cos\alpha & sin\alpha & 0 \\ -sin\alpha & cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is the inverse of the matrix $\begin{bmatrix} cos\alpha & -sin\alpha & 0 \\ sin\alpha & cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$

23. To raise money for orphanage, students of three schools A, B and C organized an exhibition in their locality, where they sold paper bags, scrap-books and pastel sheets made by them using recycled paper, at the rate of Rs.20, Rs.15 and Rs.5 per unit respectively. School A sold 25 paper- bags, 12 scrap-books and 34pastel sheets. School B sold 22 paper - bags, 15 scrap-books and 28pastel sheets while School C sold 26 paper - bags ,18 scrap-books and 36pastel sheets. Using matrices, find the total amount raised by each school. Ans: Rs.850,Rs.805,Rs970

24. If $A=\begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$,then find the value of $A^2-3A+2I$ Ans: $\begin{bmatrix} 1 & -1 & -1 \\ 3 & -3 & -4 \\ -3 & 2 & 0 \end{bmatrix}$

25. Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

26. A diet contains 30 units of vitamin A, 40 units of vitamin B and 20 units of vitamin C. Three types of foods P Q and R are available. 1 unit of food P contains 3 units of vitamin A, 2 units of vitamin B and 1 unit of vitamin C, 1 unit of food Q contains 1 units of vitamin A, 2 units of vitamin B and 1 unit of vitamin C and 1 unit of food R contains 5 units of vitamin A, 3 units of vitamin B and 2 units of vitamin C. Represent the above situation algebraically and find the diet contains of each type food by using matrix method.

27. If $A=\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$,find A^{-1}. Using A^{-1}, solve the system of linear equations

$x - 2y = 10,\quad 2x - y - z = 8, and - 2y + z = 7.$

28. If $A = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, find BA and use this to solve the system equations $y + 2z = 7,\ x - y = 3, and\ 2x + 3y + 4z = 17$

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VACATION HOME WORK

CLASS XII (**Informatics Practices**)

Make a separate notebook and write answers to all questions. As Python is case sensitive language, be careful while writing the code.

Q1. Very short answer questions: Q. from 1 for 21 (Page number 90)

Q2. Write Python code to prepare the given Data Frames and print it:

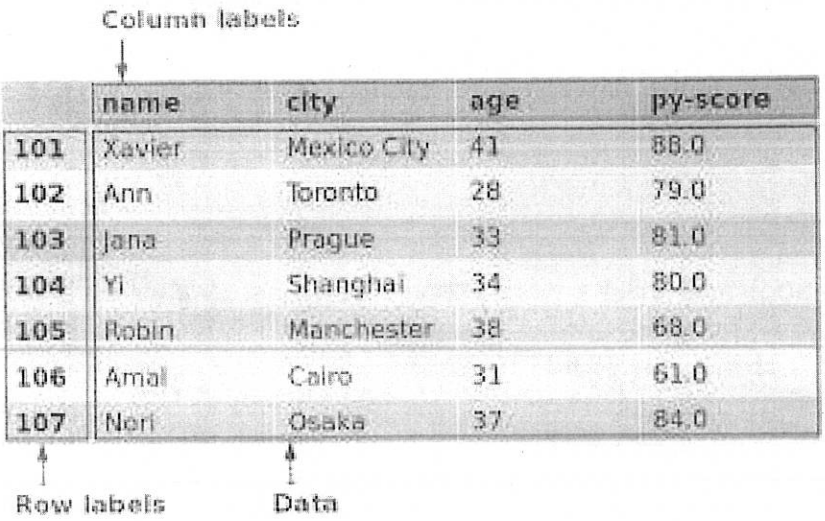
a.

	Bob	Sue
Product A	I liked it.	Pretty good.
Product B	It was awful.	Bland.

b.

	Name	Team	Number	Position	Age	Height	Weight
0	Avery Bradley	Boston Celtics	0.0	PG	25.0	6-2	180.0
1	Jae Crowder	Boston Celtics	99.0	SF	25.0	6-6	235.0
2	John Holland	Boston Celtics	30.0	SG	27.0	6-5	205.0
3	R.J. Hunter	Boston Celtics	28.0	SG	22.0	6-5	185.0
4	Jonas Jerebko	Boston Celtics	8.0	PF	29.0	6-10	231.0
5	Amir Johnson	Boston Celtics	90.0	PF	29.0	6-9	240.0
6	Jordan Mickey	Boston Celtics	55.0	PF	21.0	6-8	235.0
7	Kelly Olynyk	Boston Celtics	41.0	C	25.0	7-0	238.0
8	Terry Rozier	Boston Celtics	12.0	PG	22.0	6-2	190.0
9	Marcus Smart	Boston Celtics	36.0	PG	22.0	6-4	220.0
10	Jared Sullinger	Boston Celtics	7.0	C	24.0	6-9	260.0
11	Isaiah Thomas	Boston Celtics	4.0	PG	27.0	5-9	185.0
12	Evan Turner	Boston Celtics	11.0	SG	27.0	6-7	220.0
13	James Young	Boston Celtics	13.0	SG	20.0	6-6	215.0

c.



	name	city	age	py-score
101	Xavier	Mexico City	41	88.0
102	Ann	Toronto	28	79.0
103	Jana	Prague	33	81.0
104	Yi	Shanghai	34	80.0
105	Robin	Manchester	38	68.0
106	Amal	Cairo	31	61.0
107	Nori	Osaka	37	84.0

d.

Sl. No.	Stream	Name	Height	Weight
1	Science	Ayush	5.6	67
2	Science	Anirban	5.8	56
3	Commerce	Saurav	6.1	76
4	Humanities	Laxman	5.9	58
5	Commerce	Rahul	5.8	49
6	Science	Sneha	6	55
7	Hotel Management	Harshit	5.11	68
8	Humanities	Bhaibhav	5.9	63
9	Aviation	Karan	5.8	59
10	Physical Education	Tyagi	5.5	65

e.

```
Result dataframe :
        Name  Age    Stream  Percentage
0      Ankit   22      Math          90
1    Swapnil   20  Commerce          90
2  Aishwarya   21   Science          96
3   Priyanka   19      Math          75
5    Shaurya   22   Science          80
```

Q3. Write Python code to create a given series to store the month's name and the total number of days of the month, then print it.

Q4. Write Python code to create a Data Frame to store your class timetable.

Q5. Write short note attributes of a Pandas Series.

Q6. Write Python code to create a series using Numpy array.

Q7. Write Python code to create DataFrame from the given data then give few examples, how to select columns of data frame as per our choice:

	Organization	Salesperson Name	Sales
0	Google	Sam	200
1	Google	Charlie	120
2	Salesforce	Ralph	125
3	Salesforce	Emily	250
4	Adobe	Rosalynn	150
5	Adobe	Chelsea	500

Q8. Explain the use of head() and tail() functions used in Pandas Series.

Q9. How Vector operations can be applied on Series in Pandas? Give suitable examples.

Q10. Write Python code to create a series s1 using the list [1,3,5,6,7,8,11,-23,34,56,76,87,98,-90,100].

Write Python code to print:

a. All even numbers
b. All odd numbers
c. Sum of all numbers
d. Sum of positive numbers
e. Sum of negative numbers
(Hint: use for loop)

Q11. Multiple choice questions (Page Number 64-66) Q.no. 1- 25.

Write full statement of question and the correct answer with reason.

Q12. Write the differences between (any four points):

a. List and Tuple
b. List and Series
c. Series and Dataframe
d. List and Dictionary

Vacation Home Work

Class - 12th - 2023-24

HOME - SCIENCE

PROJECT:

(1) Planning any five messages for nutrition, health and life skills using different modes of communication for different focal groups.

(2) Market survey of any five processed food with their packaging and label information.

Question - Answers

Q.1 Differentiate between:

a) Work and Meaningful work

b) Job and Career.

Q.2 What are the different ways in which work can be perceived?

Q.3 Why agriculture is considered as one of the major occupation in India?

Q.4 How are women guaranteed equality in India?

Q.5 Define Ergonomics. What are the benefits of Ergonomics?

Q.6 What is nutrition?

Q.7 Write the objectives of diet therapy.

Q.8 Give Classification of Diets.

Q.9 How change in consistency of food helps in nutritional diet therapy?

Q.10 What are the different feeding routes?

Q.11 Give definition of: Nutraceuticals, Medical Foods and Phytochemicals

Q.12 What are the career avenues in the field of Clinical Nutrition and Dietetics?

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SUBJECT – ENGINEERING GRAPHICS **CLASS-12th (2023-24)**

SUMMER VACATION HOMEWORK (Single solid)

Date: 25/04/2023 **Last date of submission: 16/06/24**

1. Draw the isometric projection of an equilateral triangular prism of 40 mm base side and 75 mm axis resting on its base in H.P. with one of its base edge parallel to V.P. in front.
2. A Pentagonal prism of base side of 25 mm and axis length of 55 mm is resting on its face with its axis parallel to both H.P and V.P. Draw its isometric projection.
3. Draw the isometric projection of an inverted pentagonal pyramid of base side 30 mm and axis of 60 mm resting on its base on H.P. with one of its base side parallel to V.P. and nearer to the observer.
4. Draw the isometric projection of a frustum of square pyramid of shorter base edge 30 mm and longer base edge 50 mm with the axial height of 60 mm, kept on H.P. on its shorter end and two of its base edges are parallel to V.P.
5. Draw the isometric projection of a hexagonal pyramid having base edge of 40 mm and axis 70 mm resting on its base keeping two of its base side perpendicular to the V.P.
6. Draw the isometric projection of a cylinder of diameter 40 mm and axial length of 70 mm lying on the H.P. keeping its axis parallel to H.P. and V.P. both.
7. Draw the isometric projection of a frustum of a cone of diameter 30 mm at smaller end, diameter 50 mm at bigger end and the axial height is 70 mm. It is resting on its bigger end on H.P. keeping its axis vertical.
8. Draw the isometric projection of a sphere of diameter 50 mm

CLASS - XII

VACATION HOMEWORK

BUSINESS STUDIES PROJECT

Prepare a project on any one of the following topics.

(a) Marketing management

(b) Principles of Management

(c) Stock Exchange

DELHI PUBLIC SCHOOL, BHILAI (CG)
VACATION HOME WORK
CLASS XII - ACCOUNTANCY

Project Work

One specific project based on financial statement analysis of a company covering any two aspects from the following :

1. Comparative and common size financial statements
2. Accounting Ratios
3. Segment Reports
4. Cash Flow Statements

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Vacation Home Work

XII

Economics

Project Work.

Suggestive Topics :-

1. India — 1950 - 1990
2. Economic Reforms Since 1991 / NEP-1991 / LPG
3. Government Budget & its components.
4. Role of RBI in credit control.
5. Bumper Production — Boon or Bane for the farmers.
6. GST and its impact on GDP
7. Demonetisation.
8. Human Capital Formation in India
9. Monetary Policy and its components.
10. Components of Fiscal Policy.

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Summer Vacation Home Work – 2023

Class – 12 (Physical Education)

1. Make a flow chart of organising committee for conducting sports competition.
2. Draw a knock out fixture for 12 & 23 teams with all the steps involved.
3. Draw a league fixture for 9 teams by applying staircase method.
4. Draw a picture / diagram of any one stadium of your choice out of the following :

   Basketball , Football , Badminton , Volleyball & cricket

Note : Do the home work in your physical education class work copy & picture / diagram in 1/4 th chart paper.