

CHAPTER 3 & 4

MATRICES AND DETERMINANTS

VERY SHORT ANSWER TYPE QUESTIONS (1 Mark)

1. If $\begin{bmatrix} x+3 & 4 \\ y-4 & x+y \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ 3 & 9 \end{bmatrix}$, find x and y .
2. If $A = \begin{bmatrix} i & 0 \\ 0 & -i \end{bmatrix}$ and $B = \begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$, find AB .
3. Find the value of $a_{23} + a_{32}$ in the matrix $A = [a_{ij}]_{3 \times 3}$
where $a_{ij} = \begin{cases} |2i - j| & \text{if } i > j \\ -i + 2j + 3 & \text{if } i \leq j \end{cases}$.
4. If B be a 4×5 type matrix, then what is the number of elements in the third column.
5. If $A = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$ find $3A - 2B$.
6. If $A = \begin{bmatrix} 2 & -3 \\ -7 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 2 & -6 \end{bmatrix}$ find $(A+B)'$.
7. If $A = [1 \ 0 \ 4]$ and $B = \begin{bmatrix} 2 \\ 5 \\ 6 \end{bmatrix}$ find AB .
8. If $A = \begin{bmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{bmatrix}$ is symmetric matrix, then find x .
9. For what value of x the matrix $\begin{bmatrix} 0 & 2 & -3 \\ -2 & 0 & -4 \\ 3 & 4 & x+5 \end{bmatrix}$ is skew symmetric matrix.
10. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix} = P + Q$ where P is symmetric and Q is skew-symmetric matrix, then find the matrix Q .

11. Find the value of $\begin{vmatrix} a + ib & c + id \\ -c + id & a - ib \end{vmatrix}$
12. If $\begin{vmatrix} 2x + 5 & 3 \\ 5x + 2 & 9 \end{vmatrix} = 0$, find x .
13. For what value of k , the matrix $\begin{bmatrix} k & 2 \\ 3 & 4 \end{bmatrix}$ has no inverse.
14. If $A = \begin{bmatrix} \sin 30^\circ & \cos 30^\circ \\ -\sin 60^\circ & \cos 60^\circ \end{bmatrix}$, what is $|A|$.
15. Find the cofactor of a_{12} in $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$.
16. Find the minor of a_{23} in $\begin{vmatrix} 1 & 3 & -2 \\ 4 & -5 & 6 \\ 3 & 5 & 2 \end{vmatrix}$.
17. Find the value of P , such that the matrix $\begin{bmatrix} -1 & 2 \\ 4 & P \end{bmatrix}$ is singular.
18. Find the value of x such that the points $(0, 2)$, $(1, x)$ and $(3, 1)$ are collinear.
19. Area of a triangle with vertices $(k, 0)$, $(1, 1)$ and $(0, 3)$ is 5 unit. Find the value (s) of k .
20. If A is a square matrix of order 3 and $|A| = -2$, find the value of $|-3A|$.
21. If $A = 2B$ where A and B are square matrices of order 3×3 and $|B| = 5$, what is $|A|$?
22. What is the number of all possible matrices of order 2×3 with each entry 0, 1 or 2.
23. Find the area of the triangle with vertices $(0, 0)$, $(6, 0)$ and $(4, 3)$.
24. If $\begin{vmatrix} 2x & 4 \\ -1 & x \end{vmatrix} = \begin{vmatrix} 6 & -3 \\ 2 & 1 \end{vmatrix}$, find x .

25. If $A = \begin{bmatrix} x+y & y+z & z+x \\ z & x & y \\ 1 & 1 & 1 \end{bmatrix}$, write the value of $\det A$.
26. If $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ such that $|A| = -15$, find $a_{11} C_{21} + a_{12} C_{22}$ where C_{ij} is cofactors of a_{ij} in $A = [a_{ij}]$.
27. If A is a non-singular matrix of order 3 and $|A| = -3$ find $|\text{adj } A|$.
28. If $A = \begin{bmatrix} 5 & -3 \\ 6 & 8 \end{bmatrix}$ find $(\text{adj } A)$
29. Given a square matrix A of order 3×3 such that $|A| = 12$ find the value of $|A \text{ adj } A|$.
30. If A is a square matrix of order 3 such that $|\text{adj } A| = 8$ find $|A|$.
31. Let A be a non-singular square matrix of order 3×3 find $|\text{adj } A|$ if $|A| = 10$.
32. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}$ find $|(A^{-1})^{-1}|$.
33. If $A = \begin{bmatrix} -1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ -4 \\ 0 \end{bmatrix}$ find $|AB|$.

SHORT ANSWER TYPE QUESTIONS (4 MARKS)

34. Find x, y, z and w if $\begin{bmatrix} x-y & 2x+z \\ 2x-y & 3x+w \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$.
35. Construct a 3×3 matrix $A = [a_{ij}]$ whose elements are given by
- $$a_{ij} = \begin{cases} 1+i+j & \text{if } i \geq j \\ \frac{|i-2j|}{2} & \text{if } i < j \end{cases}$$

36. Find A and B if $2A + 3B = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 0 & -1 \end{bmatrix}$ and $A - 2B = \begin{bmatrix} 3 & 0 & 1 \\ -1 & 6 & 2 \end{bmatrix}$.

37. If $A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & -1 & -4 \end{bmatrix}$, verify that $(AB)' = B'A'$.

38. Express the matrix $\begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix} = P + Q$ where P is a symmetric and Q is a skew-symmetric matrix.

39. If $A = \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix}$, then prove that $A^n = \begin{bmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{bmatrix}$ where n is a natural number.

40. Let $A = \begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 2 \\ 7 & 4 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$, find a matrix D such that $CD - AB = O$.

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

42. Prove that the product of the matrices

$$\begin{bmatrix} \cos^2 \theta & \cos \theta \sin \theta \\ \cos \theta \sin \theta & \sin^2 \theta \end{bmatrix} \text{ and } \begin{bmatrix} \cos^2 \phi & \cos \phi \sin \phi \\ \cos \phi \sin \phi & \sin^2 \phi \end{bmatrix}$$

is the null matrix, when θ and ϕ differ by an odd multiple of $\frac{\pi}{2}$.

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

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

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

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

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

48. Test the consistency of the following system of equations by matrix method :

$$3x - y = 5; 6x - 2y = 3$$

49. Using elementary row transformations, find the inverse of the matrix

$$A = \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}, \text{ if possible.}$$

50. By using elementary column transformation, find the inverse of $A = \begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$.

51. If $A = \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$ and $A + A' = I$, then find the general value of α .

Using properties of determinants, prove the following : Q 52 to Q 59.

52.
$$\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$$

53.
$$\begin{vmatrix} x+2 & x+3 & x+2a \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix} = 0 \text{ if } a, b, c \text{ are in A.P.}$$

54.
$$\begin{vmatrix} \sin \alpha & \cos \alpha & \sin(\alpha + \delta) \\ \sin \beta & \cos \beta & \sin(\beta + \delta) \\ \sin \gamma & \cos \gamma & \sin(\gamma + \delta) \end{vmatrix} = 0$$

$$55. \begin{vmatrix} b^2 + c^2 & a^2 & a^2 \\ b^2 & c^2 + a^2 & b^2 \\ c^2 & c^2 & a^2 + b^2 \end{vmatrix} = 4a^2b^2c^2.$$

$$56. \begin{vmatrix} b+c & c+a & a+b \\ q+r & r+p & p+q \\ y+z & z+x & x+y \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ p & q & r \\ x & y & z \end{vmatrix}.$$

$$57. \begin{vmatrix} a^2 & bc & ac + c^2 \\ a^2 + ab & b^2 & ac \\ ab & b^2 + bc & c^2 \end{vmatrix} = 4a^2b^2c^2.$$

$$58. \begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix} = x^2(x+a+b+c).$$

59. Show that :

$$\begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ yz & zx & xy \end{vmatrix} = (y-z)(z-x)(x-y)(yz+zx+xy).$$

60. (i) If the points (a, b) , (a', b') and $(a-a', b-b')$ are collinear. Show that $ab' = a'b$.

(ii) If $A = \begin{bmatrix} 2 & 5 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -3 \\ 2 & 5 \end{bmatrix}$ verify that $|AB| = |A||B|$.

61. Given $A = \begin{bmatrix} 0 & -1 & 2 \\ 2 & -2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 1 & 0 \\ 1 & 1 \end{bmatrix}$. Find the product AB and

also find $(AB)^{-1}$.

62. Solve the following equation for x .

$$\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0.$$

63. If $A = \begin{bmatrix} 0 & -\tan \frac{\alpha}{2} \\ \tan \frac{\alpha}{2} & 0 \end{bmatrix}$ and I is the identity matrix of order 2, show that,

$$I + A = (I - A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$$

64. Use matrix method to solve the following system of equations : $5x - 7y = 2$, $7x - 5y = 3$.

LONG ANSWER TYPE QUESTIONS (6 MARKS)

65. Obtain the inverse of the following matrix using elementary row operations

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}.$$

66. Use product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the system of equations

$$x - y + 2z = 1, 2y - 3z = 1, 3x - 2y + 4z = 2.$$

67. Solve the following system of equations by matrix method, where $x \neq 0$, $y \neq 0$, $z \neq 0$

$$\frac{2}{x} - \frac{3}{y} + \frac{3}{z} = 10, \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 10, \frac{3}{x} - \frac{1}{y} + \frac{2}{z} = 13.$$

68. Find A^{-1} , where $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$, hence solve the system of linear equations :

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

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

$$3x - 3y - 4z = 11$$

69. The sum of three numbers is 2. If we subtract the second number from twice the first number, we get 3. By adding double the second number and the third number we get 0. Represent it algebraically and find the numbers using matrix method.
70. Compute the inverse of the matrix.

$$A = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 5 \end{bmatrix} \text{ and verify that } A^{-1} A = I_3.$$

71. If the matrix $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$ and $B^{-1} = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & -1 \\ 1 & 0 & 2 \end{bmatrix}$, then compute $(AB)^{-1}$.

72. Using matrix method, solve the following system of linear equations :

$$2x - y = 4, 2y + z = 5, z + 2x = 7.$$

73. Find A^{-1} if $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$. Also show that $A^{-1} = \frac{A^2 - 3I}{2}$.

74. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ by using elementary column transformations.

75. Let $A = \begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$ and $f(x) = x^2 - 4x + 7$. Show that $f(A) = 0$. Use this result to find A^5 .

76. If $A = \begin{bmatrix} \cos \alpha & -\sin \alpha & 0 \\ \sin \alpha & \cos \alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$, verify that $A \cdot (\text{adj } A) = (\text{adj } A) \cdot A = |A| I_3$.

77. For the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$, verify that $A^3 - 6A^2 + 9A - 4I = 0$, hence find A^{-1} .

78. Find the matrix X for which

$$\begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix} \cdot X \cdot \begin{bmatrix} -1 & 1 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ 0 & 4 \end{bmatrix}$$

79. By using properties of determinants prove the following :

$$\begin{vmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = (1+a^2+b^2)^3.$$

$$80. \begin{vmatrix} (y+z)^2 & xy & zx \\ xy & (x+z)^2 & yz \\ xz & yz & (x+y)^2 \end{vmatrix} = 2xyz(x+y+z)^3.$$

$$81. \begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3.$$

$$82. \text{ If } x, y, z \text{ are different and } \begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0. \text{ Show that } xyz = -1.$$

83. If x, y, z are the 10th, 13th and 15th terms of a G.P. find the value of

$$\Delta = \begin{vmatrix} \log x & 10 & 1 \\ \log y & 13 & 1 \\ \log z & 15 & 1 \end{vmatrix}.$$

84. Using the properties of determinants, show that :

$$\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right) = abc + bc + ca + ab$$

85. Using properties of determinants prove that

$$\begin{vmatrix} -bc & b^2 + bc & c^2 + bc \\ a^2 + ac & -ac & c^2 + ac \\ a^2 + ab & b^2 + ab & -ab \end{vmatrix} = (ab + bc + ca)^3$$

86. If $A = \begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$, find A^{-1} and hence solve the system of equations

$$3x + 4y + 7z = 14, 2x - y + 3z = 4, x + 2y - 3z = 0.$$

ANSWERS

1. $x = 2, y = 7$

2. $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$

3. 11.

4. 4

5. $\begin{bmatrix} 9 & -6 \\ 0 & 29 \end{bmatrix}$.

6. $\begin{bmatrix} 3 & -5 \\ -3 & -1 \end{bmatrix}$.

7. $AB = [26]$.

8. $x = 5$

9. $x = -5$

10. $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$.

11. $a^2 + b^2 + c^2 + d^2$.

12. $x = -13$

13. $k = \frac{3}{2}$

14. $|A| = 1$.

15. 46

16. -4

$$17. \quad P = -8$$

$$18. \quad x = \frac{5}{3}.$$

$$19. \quad k = \frac{10}{3}.$$

$$20. \quad 54.$$

$$21. \quad 40.$$

$$22. \quad 729$$

$$23. \quad 9 \text{ sq. units}$$

$$24. \quad x = \pm 2$$

$$25. \quad 0$$

$$26. \quad 0$$

$$27. \quad 9$$

$$28. \quad \begin{bmatrix} 8 & 3 \\ -6 & 5 \end{bmatrix}.$$

$$29. \quad 1728$$

$$30. \quad |A| = 9$$

$$31. \quad 100$$

$$32. \quad 11$$

$$33. \quad |AB| = -11$$

$$34. \quad x = 1, y = 2, z = 3, w = 4$$

$$35. \quad \begin{bmatrix} 3 & 3/2 & 5/2 \\ 4 & 5 & 2 \\ 5 & 6 & 7 \end{bmatrix}.$$

$$36. \quad A = \begin{bmatrix} \frac{11}{7} & -\frac{9}{7} & \frac{9}{7} \\ \frac{1}{7} & \frac{18}{7} & \frac{4}{7} \\ \frac{1}{7} & \frac{18}{7} & \frac{4}{7} \end{bmatrix}, \quad B = \begin{bmatrix} -\frac{5}{7} & -\frac{2}{7} & \frac{1}{7} \\ \frac{4}{7} & -\frac{12}{7} & -\frac{5}{7} \\ \frac{4}{7} & -\frac{12}{7} & -\frac{5}{7} \end{bmatrix}$$

$$40. \quad D = \begin{bmatrix} -191 & -110 \\ 77 & 44 \end{bmatrix}.$$

$$41. \quad x = -2 \text{ or } -14$$

$$43. \quad A^{-1} = \begin{bmatrix} -7 & 3 \\ 12 & -5 \end{bmatrix}.$$

$$44. \quad f(A) = 0$$

$$45. \quad x = 9, y = 14$$

$$46. \quad x = \begin{bmatrix} 1 & -2 \\ 2 & 0 \end{bmatrix}.$$

48. Inconsistent

49. Inverse does not exist.

$$50. \quad A^{-1} = \begin{bmatrix} 2 & -1 \\ -5 & 3 \end{bmatrix}.$$

$$51. \quad \alpha = 2n\pi \pm \frac{\pi}{3}, \quad n \in \mathbb{Z}$$

$$61. \quad AB = \begin{bmatrix} 1 & 2 \\ -2 & 2 \end{bmatrix}, \quad (AB)^{-1} = \frac{1}{6} \begin{bmatrix} 2 & -2 \\ 2 & -1 \end{bmatrix}.$$

$$62. \quad 0, 3a$$

$$64. \quad x = \frac{11}{24}, \quad y = \frac{1}{24}.$$

$$65. \quad A^{-1} = \begin{bmatrix} \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ -4 & 3 & -1 \\ \frac{5}{2} & -\frac{3}{2} & \frac{1}{2} \end{bmatrix}.$$

$$66. \quad x = 0, \quad y = 5, \quad z = 3$$

$$67. \quad x = \frac{1}{2}, \quad y = \frac{1}{3}, \quad z = \frac{1}{5}$$

$$68. \quad A^{-1} = -\frac{1}{67} \begin{bmatrix} -6 & 17 & 13 \\ 14 & 5 & -8 \\ -15 & 9 & -1 \end{bmatrix}$$

$$69. \quad x = 1, \quad y = -2, \quad z = 2$$

$$70. \quad A^{-1} = \begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$$

$$71. \quad (AB)^{-1} = \frac{1}{19} \begin{bmatrix} 16 & 12 & 1 \\ 21 & 11 & -7 \\ 10 & -2 & 3 \end{bmatrix}.$$

$$72. \quad x = 3, \quad y = 2, \quad z = 1.$$

$$73. \quad A^{-1} = \frac{1}{2} \begin{bmatrix} -1 & 1 & 1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{bmatrix}.$$

$$74. \quad A^{-1} = \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix}$$

$$75. \quad A^5 = \begin{bmatrix} -118 & -93 \\ 31 & -118 \end{bmatrix}.$$

$$77. \quad A^{-1} = \frac{1}{4} \begin{bmatrix} 3 & 1 & -1 \\ 1 & 3 & 1 \\ -1 & 1 & 3 \end{bmatrix}.$$

$$78. \quad X = \begin{bmatrix} -16 & 3 \\ 24 & -5 \end{bmatrix}.$$

$$83. \quad 0$$

$$86. \quad x = 1, y = 1, z = 1.$$

CLASS- XII
HOLIDAYS HOME WORK
ENGLISH

1. Read newspaper daily and cut samples of the following & paste them in the fair notebook of English

underlining it with the holidays homework a) 3 reports

b) 3 articles

c) 3 posters

2. Write a letter to the editor of a national daily highlighting the neglect of our national monuments and how these are being damaged in the present day world.

3. Write an article on the topic 'how Google controls the life of an average person' (150-200 words)

4. Learn and revise all the syllabus of periodic test -1

5. Suggested topics for project

1. Investigation on the result of students' reading habits on their academic performance in external examinations. (CBSE)

2. Linguistic Chauvinism in India

3. War and its ramifications

4. Gandhism: Obsolete or Relevant

5. Life on children in slum area

6. Child labour in my city

Any other topic with teacher's discussion.

THE PROJECT – PORTFOLIO MUST INCLUDE THE FOLLOWING:

I. Cover Page – Title of Project

II. School details & detail of students

III. Statement of Purpose / objectives / goals.

IV. Acknowledgement

V. Certificate of completion under the guidance of the teacher.

VI. Action Plan for the Project

VII. Questionnaires for interview

VIII. A 'Report' on the Topic opted for.

IX. List of resources / bibliography

2. INCLUSIONS: Photographs that capture the positive learning experience of the student.

ECONOMICS

1. Complete Economics Project work TERM-2 & Submit the Project file on 15-01-2022.

2. Prepare for EVALUATION-3.

SYLLABUS-

***NATIONAL INCOME**

3. Solve Practice question paper in fair note book and submit on 15-01-2022.

(c) Fertility rate

1. Complete the assignment in fair notebook.....

Chapter 1: Indian Economy on the Eve of Independence

Q1 Arrange the following events of India before the independence in chronological order:

(1) The opening of the Suez Canal

- (2) Introduction of the railways
- (3) Second stage of demographic transition
- (4) Incorporation of the Tata Iron and Steel Company

Q2 India's demographic condition on the eve of independence was characterized by(1)

- (a) High level of literacy, high mortality rates, high life expectancy and high level of poverty.
- (b) Low level of literacy, low mortality rates, low life expectancy and Low level of poverty
- (c) Low level of literacy, low mortality rates, high life expectancy and high level of poverty
- (d) Low level of literacy, high mortality rates, low life expectancy and high level of poverty.

Q3is considered as one of the most important contributions of the British.(1)

- (a) Construction of all-weather roads
- (b) Introduction of the railways in 1850
- (c) Introduction of electric telegraph in India
- (d) The postal services

Q4 Under the British colonial rule, the agricultural production decreased.

True/ False? Give reason

(1)

Q5 One of the significant drawbacks of the industrial policy pursued by the British colonial administration was the very limited area of operation of the public sector.

This sector remained confined only to the (1)

Q.6 What was the focus of the economic policies pursued by the colonial government in India? What were the impacts of these policies? (3)

Q7 What was the two-fold motive behind the systematic deindustrialization effected by the British in pre-independent India? (3)

Q8 Highlight the salient features of India's pre-independence occupational structure.(4)

Q9 "Under the colonial regime, basic infrastructure such as railways, ports, water transport, posts and telegraph develop. However, the real motive behind infrastructure development was not to provide basic amenities to the people but to subserve various colonial interests"

What objectives did the British intend to achieve through their policies of infrastructure development in India? (4)

Q.10 "The social and economic challenges before India at the time of independence were enormous."Do you agree with the statement' Give reasons. (6)

2. Prepare a **Project Report** on any**ONE**topic (choose from Macro Economics/
Indian Economic Development/current economic issue)

3. **Do any one activity**.....

(a) **FLASH CARDS**.....(any one)

- National income formulae
- Differences (Ch 1-4) MACRO

(b) **FLOW CHART/MODEL**.....(any one)

- Two sector model showing Real and money flow
- Circular flow of Income
- Functions of RBI
- Credit control methods by RBI

(c) CROSS WORD PUZZLE.....(any one chapter)

- Ch: 2/3/4/5/6 (MACRO)
- Ch: 1,2 (IED)

*Daily sit 10 minutes with your eye closed. Deeply inhale and exhale.

Try to search out your interest areas, your strength and check your weaknesses.

Make a list of your own capabilities and start working to strengthen the desired areas with 100% commitment*.

ACCOUNTANCY

- 1.Prepare a specific project file reflecting an original business trading, profit and loss account and balance sheet, analysing financial statement by using ratio analysis.prepare neat, clean and creative project filer.
2. Revise ch: 1Fundamentals of partnership, Ch-2 Change in profit shareing ratio in existing partners
- 3.Prepare a model on Rules in the absence of deel/Merits of partnerships/Demerits of patenership/Formate
4. Solve the assignment attached-
5. Prepare cross word puzzle on chapter1 and 2

Q1.Which of the following elements of the nature of partnership is so important that there would be no partnership, if this element is absent?

- | | |
|---------------------|------------------------|
| (a) Agreement | (b) Sharing of profits |
| (c) Lawful business | (d) Mutual agency (1) |

Q2. Interest on partner's loan shall be paid even if there are losses in the business. True/False? Give reason. (1)

Q3. A partner withdrew 50,000 at the beginning of each half year during 2019-20. What interest will be charged on his drawings @ 5%p.a.?

- | | |
|----------|---------------|
| (a) 2500 | (b) 1250 |
| (c) 3750 | (d) 1875` (1) |

Q4. In addition to the amount of capital, a new partner is also required to contribute some additional amount for loss of their share in profits of the firm, which is known as _____.

Q5. Govind and shyam are partners sharing profits in the ratio of 3:1. Krishna is admitted for 1/4th share in profits of the firm. The new profit sharing ratio is _____ and the Sacrificing ratio _____. (1)

Q6. Anil and Sunil are partners sharing profits and losses in the ratio of 3:2. They admit Charan as a new partner from 1st April, 2020. Anil gives 1/3rd of his share while Sunil gives 1/10th from his share to Charan. Calculate the Sacrificing ratios and the new ratios. (3)

Q7. X, Y and Z are partners sharing profits in the ratio of 4:3:2. From April 1,2017, they decided to share the profits equally. On that date their books showed the following items:

	₹
Profit and Loss Account (Cr.)	1,20,000
General Reserve	45,000
Workmen Compensation Reserve	60,000
Advertisement Suspense Account(Dr.)	90,000

Record the necessary journal entries. (3)

Q8. A firm's average profits are ₹70,000. It includes an abnormal profit of ₹5,000. Capital invested in the business is ₹5,50,000 and the normal rate of return is 10%. Calculate goodwill at four times the super profit. (4)

Q9. Kavita, Meenakshi and Gauri are partners doing a paper business in Ludhiana. After the Account of partnership have been drawn up and closed, it was discovered that for the years ending 31st March 2019 and 2020, interest on capital has been allowed to partners @6%p.a. although there is no provision for interest on capital in the partnership deed. Their fixed capitals were 2,00,000; 1,60,000; and 1,20,000 respectively.

Year	Profit sharing Ratio
31 March 2019	3 : 2 : 1
31 March 2020	5 : 3 : 2

You are required to give necessary adjusting entry on April 1, 2020. (4)

OR

Q9. Ram, Mohan and Sohan are partners with capitals of ₹5,00,000, ₹2,50,000 and ₹2,00,000 respectively. After providing interest on Capital @ 10%p.a. the profits are divisible as follows: Ram 1/2, Mohan 1/3 and Sohan 1/6. But ram and Mohan guaranteed that Sohan's share in the profit shall not be less than 45,000 in any year. The net profit for the year ended 31st March , 2020 is 2,00,000, before charging interest on capital. Prepare Profit and Appropriation Account to show distribution of profit for the year 2019-20. (4)

Q10. A and B are partners with capitals of ₹5,00,000 and ₹3,00,000 respectively. The Profit for the year ended 31st March 2019 was ₹3,46,000 before allowing interest on partner's loan. Show the distribution of profits after taking the following into consideration:

- (i) Interest on A's Loan of ₹1,50,000 to the firm provided on 1st April, 2018.**
- (ii) Interest on capital to be allowed @5%p.a.**

(iii) Interest on drawings @6% p.a. Drawings were A ₹60,000 and B ₹40,000.

(iv) B is to be allowed a Commission of 2% on Sales. Sales for the year were ₹30,00,000.

(v) 10% of the divisible profits is to be kept in a Reserve Account (6)

BUSINESS STUDIES

1. 1 Do The Case Study Questions on Note book at least 10 from each chapter 1,2,3.

2 Do project work on Study on Ch 3 , Business Environment. Changing role of women in the past 25 years .

OR

Do Project work Roll No wise

1-9	Soaps
10-18	Toothpaste
19-27	Mobiles
28-36	Cosmetics
37 - onward	Cold Drinks

Develop your own product as allotted, Licensing system, U.S.P.range ,Brand Name, feature, label, tag line, selling price of competitor to consumer, retailer and wholesaler, profit margin, ways of promotion, any scheme, means of transport, social message on label, cost effective.

ASSIGNMENT

Q.1 Which force is considered as the essence of management? (1)

Q.2 Name the level of management of the following sections:

(a) Purchase managers (b) CEO (1)

Q.3 Identify the Fayol principle of management in which salaries paid to employees should be fair, just and equitable. (1)

Q.4 Distinguish between Time study and Motion study. (1)

Q.5 “Social trends present various opportunities and threats to business enterprises. “Give an example. Explain the concept. (3)

OR

Principles of Taylor and Fayol are mutually complementary. One believed that management should not close its ears to constructive suggestions made by the employees, while the other suggested that a good company should have an employee suggestion system, whereby suggestions which results in substantial time or cost reduction should be rewarded. Identify and explain the principles of Taylor and Fayol referred in the above para.

Q6. Reeta is the manager of the western division of a large corporate house. At what level does she work in the organization? What are her basic functions? (3)

Q7. Write the essential features of:

(a) Liberalization (b) Privatization (c) Globalization (d) Demonetization

Q8.Telco Ltd is manufacturing files and folders from old clothes to discourage use of plastic files and folders For this purpose they employ people from nearby villages where very less jobs opportunities are available

An employee, Harish, designed a plan for cost reduction but it was not welcomed by the production manager.

Another employee gave some suggestion for improvement in design, but it was not appreciated by Production manager

- (a) State the principal of management described in the para.
- (b) Identify any two that the company wants to communicate to the society.

(5)

Q.9 Ultra Paints co. which is manufacturing paints had been enjoying a prominent market position as it Manufactured best quality paints, made timely payment of taxes to government. It assembled various inputs like finance, machines, raw material etc from its environment. But since last year it has been dumping its untreated poisonous waste on the river bank which has created many health problems for the people. As a result, the court passed an order to seal the manufacturing unit of the company.

- (a) State the importance of business environment highlighted quoting the lines from the above case.
- (b) Identify any two dimensions of business environment mentioned in the above case by quoting lines from it.
- (c) State any two values which have been overlooked by the company.

(6)

I.P

1. Revise Series and DataFrame practical questions.

2.Assignment:

1. Fill in the blanks :

```
# Series Creation from List with custom indexing
import pandas as pd
l1=[11,12,13,14]
series1=pd.Series(l1, _____=["1st","2nd","3rd","4th"])
print(series1)
```

- a. row
 - b. index
 - c. row_index
 - d. Any above option
2. While trying to create series from dictionary, keys of dictionary become index.
- a. True
 - b. False
 - c. Depends on Python Version
 - d. Depends on Machine Configuration

3. Predict data elements of series1 :

```
# Series Creation from Scalar Value with custom indexing
import pandas as pd
series1=pd.Series(5,index=["A","B","C","D"])
print(series1)
```

- a. 5,1,1,1
 - b. 5,0,0,0
 - c. 5,1,5,1
 - d. 5,5,5,5
4. Which index, data elements will be printed by below code as output :

```
# Selection
import pandas as pd
l1=[11,12,13,14]
s1=pd.Series(l1)
print(s1.loc[2:])
```

- a. Data : 12,13,14 along with series-index 1,2,3
- b. Data : 13,14 along with series-index 'C','D'
- c. Data : 13,14 along with series-index 2,3
- d. Data : 12,13,14 along with series-index 'B','C','D'

```
s1=pd.Series(l1, index=['I', 'II', 'III', 'IV'])
print(s1._____['II':])
```

re, identify which attribute can be used to

II	12
III	13
IV	14

- a. loc
- b. iloc
- c. loc or iloc
- d. Neither loc nor iloc

What will be the output of following code-
import pandas as pd
s1=pd.Series([1, 2, 2, 7, 'Sachin', 77.5])
print(s1.head())

- a. Last data elements of series along with its indices i.e. -1.
- b. First data element of series along with its indices i.e. 0.
- c. Entire series
- d. First five data elements of series along with its indices i.e. 0,1,2,3,4 respectively

Series is 1-D labelled array having two parts i.e. Index, Data. We can create series from:

- Python Sequence , Dictionary
- All 4 (ie Python Sequence , Dictionary , Scalar value , Numpy Array)
- Scalar value , Numpy Array
- None of stated option.

```
import pandas as pd
l1=[11,12,13,14,15]
s1=pd.Series(l1, index=['a','b','c','d','e'])
```

thon command can be used

- s1.iloc[1:3] or s1.loc['b': 'd']

PHYSICAL EDUCATION

- Revise Chapter-1,2 and 3 and complete your notebook.
- Do the following Practical in Practical File :
 - SAI Khelo India Test for School Children.
 - Perform any two asanas used to cure Obesity, Asthma, Hypertension, Diabetes and Back pain (2 for each). Paste your pictures on LHS and briefly explain the procedure, benefits and contraindications for them.
- Evaluate yourself for the following tests and do practice daily:
 - Sit and Reach Test
 - Sit-Ups Test
 - Push-Ups for boys
 - Modified push-ups for girls
 - 50 mts. standing start
 - Partial curl ups
 - 600m run/walk
- Do **any one** of the following activity:
 - Prepare a model comparing the knockout and league fixture for 11 teams.
 - Prepare a chart/model on postural deformities- Kyphosis, Lordosis and Scoliosis.
 - Prepare a chart/model on postural deformities-Flat foot, Knock-knee and Bow Legs.
 - Prepare a project file on IPL Teams 2023.

