



# JKG INTERNATIONAL SCHOOL

(Affiliated to CBSE, Delhi. School Code No. 2130679/60305)  
Shakti Khand-II, Indirapuram, Ghaziabad- 201012

## Summer Holiday Home Work 2021-22

### Class XII B COMMERCE

#### English

- ✚ Mutual co-existence, respect for other cultures and a sense of pride in one's own culture, country and language are some of the important values that we can learn from the lesson "**The last lesson**" Comment.
- ✚ Moved by Anees Jung's account of the ragpicker's plight, you decide to write an article for your school magazine. In the article discuss the different values that society needs to inculcate to help these people loosen the grip of their pathetic circumstance. Draft the article in about 150 words.
- ✚ Draft a poster on the celebration of " Mother's Day" organized by JKG INTERNATIONAL SCHOOL, INDIRAPURAM

Note: Homework is to be done in English notebook

#### Accountancy

- ✚ Prepare a Comprehensive Project (discussed in class) under CBSE guidelines for Board 2021-22. Kindly prepare neat and clean (without cutting n overwriting) handwritten project and use A4 size sheets. For any doubt please call me personally.
- ✚ Revise chapter 2, 3 and 4, worksheet will be provided to you soon.

#### Economics

Economics (Indian economic development)

- ✚ Draw a time line starting from chapter 1 to chapter 4 from your book.
- ✚ Decorate your work with material available at home.
- ✚ Paste the work in school HW copy.

#### Informatics Practices

Complete the attached worksheet.

#### Mathematics

Do the worksheet attached.

#### Physical Education

In practical file give information about any one game of your choice.

#### Commercial Arts

Do practical work

- ✚ Educational poster: 5
- ✚ Daily life scenes: 5

**Business Studies** Do the worksheet assigned.

## IP Worksheet-1:

### **Ques 1: Create the following Series and do the specified operations:**

- EngAlph, having 26 elements with the alphabets as values and default index values.
- Vowels, having 5 elements with index labels 'a', 'e', 'i', 'o' and 'u' and all the five values set to zero.  
Check if it is an empty series.
- Friends, from a dictionary having roll numbers of five of your friends as data and their first name as keys.
- MTseries, an empty Series. Check if it is an empty series.
- MonthDays, from a numpy array having the number of days in the 12 months of a year. The labels should be the month numbers from 1 to 12.

### **Ques 2: Using the Series created in Question 1, write commands for the following:**

- Set all the values of Vowels to 10 and display the Series.
- Divide all values of Vowels by 2 and display the Series.
- Create another series Vowels1 having 5 elements with index labels 'a', 'e', 'i', 'o' and 'u' having values [2,5,6,3,8] respectively.
- Add Vowels and Vowels1 and assign the result to Vowels3.
- Subtract, Multiply and Divide Vowels by Vowels1.
- Alter the labels of Vowels1 to ['A', 'E', 'I', 'O', 'U'].

### **Ques 3: Using the Series created in Question 1, write commands for the following:**

- Find the dimensions, size and values of the Series EngAlph, Vowels, Friends, MTseries, MonthDays.
- Rename the Series MTseries as SeriesEmpty.
- Name the index of the Series MonthDays as monthno and that of Series Friends as Fname.
- Display the 3rd and 2nd value of the Series Friends, in that order.
- Display the alphabets 'e' to 'p' from the Series EngAlph.
- Display the first 10 values in the Series EngAlph.
- Display the last 10 values in the Series EngAlph.
- Display the MTseries.

### **Ques 4: Using the Series created in Question 1, write commands for the following:**

- Display the names of the months 3 through 7 from the Series MonthDays.
- Display the Series MonthDays in reverse order.

### **Ques 5: Create the following DataFrame Sales containing year wise sales figures for five sales persons in INR. Use the years as column labels, and sales person names as row labels. (1)**

	2014	2015	2016	2017
Madhu	100.5	12000	20000	50000
Kusum	150.8	18000	50000	60000
Kinshuk	200.9	22000	70000	70000
Ankit	30000	30000	100000	80000
Shruti	40000	45000	125000	90000

**Ques 6: Use the DataFrame created in Question 5 above to do the following: (4)**

- a) Display the row labels of Sales.
- b) Display the column labels of Sales.
- c) Display the data types of each column of Sales.
- d) Display the dimensions, shape, size and values of Sales.
- e) Display the last two rows of Sales.
- f) Display the first two columns of Sales.
- g) Create a dictionary using the following data. Use this dictionary to create a DataFrame Sales2.

	2018
Madhu	160000
Kusum	110000
Kinshuk	500000
Ankit	340000
Shruti	900000

- h) Check if Sales2 is empty or it contains data and Change the DataFrame Sales such that it becomes its transpose.



## **Math Worksheet on Matrices:**

Q1. If  $A = \begin{bmatrix} 6 & 5 & 7 & 0 \\ -9 & 8 & 8 & -3 \\ 5 & 6 & 2 & 8 \end{bmatrix}$  Write the order of A and find the value of  $a_{32} - a_{22} - a_{24}$ .

Q2. For what value of x and y are the following matrices equal?

$$A = \begin{bmatrix} 2x+1 & 3y \\ 0 & y^2-5y \end{bmatrix} \quad B = \begin{bmatrix} x+3 & y^2+2 \\ 0 & -6 \end{bmatrix}$$

Q3. If a matrix A has 15 elements, what are the possible orders it can have?

Q4. Construct a matrix of order  $4 \times 3$  whose elements are given by  $a_{ij} = 3i + \frac{j}{3}$

Q5. If A is a square matrix such that  $A^2 = I$  then find:

$$(A - I)^3 + (A + I)^3 - 7A$$

Q6. Find x:  $\begin{bmatrix} 1 & x & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = 0$

Q7. If  $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 & -10 \\ 1 & -2 & -5 \\ 9 & 22 & 15 \end{bmatrix}$  find A.

Q8. If  $A = \begin{bmatrix} 2 & -3 & -5 \\ -1 & 4 & 5 \\ 1 & -3 & -4 \end{bmatrix}$  show that  $A^2 = A$

Q9. Find A:  $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Q10. Matrix  $A = \begin{bmatrix} 0 & 2b & -2 \\ 3 & 1 & 3 \\ 3a & 3 & -1 \end{bmatrix}$  is given to be symmetric, find the value of a and b.

Q11. Show that all the diagonal elements of skew symmetric matrix are zero.

Q12. Express the given matrix as a sum of symmetric and skew-symmetric matrices and verify the result:

$$\begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}$$

Q13. Using elementary row transformation, find the inverse of following matrices:

(i)  $\begin{bmatrix} 1 & 3 & -2 \\ -3 & 0 & -1 \\ 2 & 1 & 0 \end{bmatrix}$

(ii)  $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$

## Topic: Determinants

Q1. Without expanding at any stage and using only properties of Determinants, Show that:

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

$$b) \Delta = \begin{vmatrix} b^2c^2 & bc & b+c \\ c^2a^2 & ca & c+a \\ a^2b^2 & ab & a+b \end{vmatrix} = 0$$

$$c) \Delta = \begin{vmatrix} 43 & 3 & 6 \\ 35 & 21 & 4 \\ 17 & 9 & 2 \end{vmatrix} = 0$$

Q2. Using properties of Determinants, Show that:

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

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

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

$$d) \Delta = \begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3 + b^3 + c^3 - 3abc$$

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

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

$$g) \Delta = \begin{vmatrix} 1 & 1+p & 1+p+q \\ 2 & 3+2p & 1+3p+2q \\ 3 & 6+3p & 1+6p+3q \end{vmatrix} = 1$$

$$h) \Delta = \begin{vmatrix} a+b+c & -c & -b \\ -c & a+b+c & -a \\ -b & -a & a+b+c \end{vmatrix} = 2(a+b)(b+c)(c+a)$$

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

$$k) \Delta = \begin{vmatrix} a+bx^2 & c+dx^2 & p+qx^2 \\ ax^2+b & cx^2+d & px^2+q \\ u & v & w \end{vmatrix} = (x^4-1) \begin{vmatrix} b & d & q \\ a & c & p \\ u & v & w \end{vmatrix}$$

Q3. Find the equation of the line joining A(1, 3) and B(0, 0) using determinants and find the value of k if D (k, 0) is a point such that area of  $\Delta ABC$  is 3 square units.

Q4. If A( $x_1, y_1$ ), B( $x_2, y_2$ ) and C( $x_3, y_3$ ) are the vertices of an equilateral triangle whose

each side is equal to a, then prove that  $\begin{vmatrix} x_1 & y_1 & 2 \\ x_2 & y_2 & 2 \\ x_3 & y_3 & 2 \end{vmatrix}^2 = 3a^4$

Q5. Show that the points (b, c+a), (c, a+b), (a, b+c) are collinear.

Q6. If A is a square matrix of order 3 such that  $|adj.A|=64$ , then find  $|A|$ .

Q7. A is a square matrix of order 3 has  $|A|=5$ . Find  $|A.adj.A|$ .

Q8. If  $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & -1 & 4 \\ -2 & 2 & 1 \end{bmatrix}$ , Find  $A^{-1}$  and hence find  $(A')^{-1}$ .

Q9. If  $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ , then show that  $A^2-4A-5I=0$  and hence find  $A^{-1}$ .

Q10. If  $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 3 & 1 & -1 \\ 1 & 3 & 1 \\ -1 & 1 & 3 \end{bmatrix}$ , find the product of AB and use the result to solve the following system of equations:

$$2x-y+z=-1$$

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

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

Q11. Two factories decided to award their employees for three values (a) adaptable to new techniques, (b) careful and alert in difficult situations and (c) keeping calm in tense situations, at the rate of Rs. x, Rs. y and Rs. z per person respectively. The first factory decided to honour respectively 2, 4 and 3 employees with a total prize of money Rs. 29,000. The second factory decided to honour respectively 5, 2 and 3 employees with the prize money Rs. 30,500. If the three prizes per person together cost Rs. 9,500, then

(i) Represent the above situation by a matrix equation and form linear equations using matrix multiplication.

(ii) Solve these equations using matrices.

Q12. 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

$$x - 2y = 10; \quad 2x - y - z = 8; \quad -2y + z = 7$$

