SARALA BIRLA
PUBLIC SCHOOL
(SARALA BIRLA GROUP OF SCHOOLS)

SARALA BIRLA PUBLIC SCHOOL

SUMMER ASSIGNMENT (2019-20)

STD – XII [Science)

Name : _____ Class and Section : _____UID No. : _____

ENGLISH

1. The astrologer's prediction about the death of the Tiger King came to be true. Do you agree with this statement?
2. Why should child labour be eliminated and how?
3. "When a people are enslaved, as long as they hold fast to their language it is as if they have the keys to their prison." What could this mean?
4. 'Lost Spring' by Anees Jung brings out the condition of children in India. Even after sixty five years of independence we have children who do not go to school, work in inhuman conditions and live in slums. As a nation we have somewhere failed in our duty. What values do we need to inculcate among the people of this nation in order to bring back the 'spring' in the lives of these children?
5. Design a poster for your school library on the values of books and good reading habits. You may use slogans.

MATHEMATICS

1. If A = $\begin{bmatrix} x & -2 \\ 3 & 7 \end{bmatrix}$ and A^{-1}= $\begin{bmatrix} \frac{7}{34} & \frac{1}{17} \\ \frac{-3}{34} & \frac{2}{17} \end{bmatrix}$, then find the value of x.
2. Given $A = \begin{bmatrix} 2 & -3 \\ 0 & 1 \end{bmatrix}$, find B such that $4A^{-1} + B = A^2$.
3. Write the value of $\begin{vmatrix} x+y & y+z & z+x \\ z & x & y \\ -3 & -3 & -3 \end{vmatrix}$.
4. If $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & -1 & 4 \\ -2 & 2 & 1 \end{bmatrix}$, find $(A')^{-1}$.
5. If $f(x) = \begin{vmatrix} a & -1 & 0 \\ ax & a & -1 \\ ax^2 & ax & a \end{vmatrix}$, using properties of determinants, find the value of $f(2x) - f(x)$.
6. Find the adjoint of the matrix A = $\begin{bmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ and hence show that A · (adj A) = $|A|I_3$.
7. Using properties of determinants, prove that the following :

   $\begin{vmatrix} a^2 & bc & ac+c^2 \\ a^2+ab & b^2 & ac^2 \\ ab & b^2+bc & c^2 \end{vmatrix} = 4a^2b^2c^2$.
8. If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$, then prove that $A^3 - 6A^2 + 7A + 2I = 0$.
9. 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 the following equations :

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

10. Prove that :

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

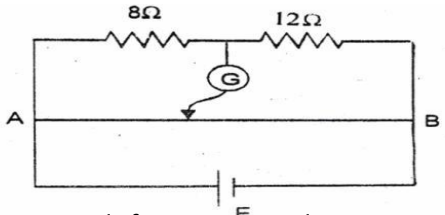
11. Using matrices, solve the following system of equations :

$$x+y+z=6, \quad x+2z=7, \quad 3x+y+z=12.$$

12. Show that if $x \neq y \neq z$ and $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0$, then $1+xyz=0 \Rightarrow xyz = -1$.

PHYSICS

1. In which orientation, a dipole placed in a uniform electric field is in (i) stable (ii) unstable Equilibrium.
2. If the radius of the Gaussian surface enclosing a charge is halved, how does the electric flux through the Gaussian surface change?
3. Three point charges of +2 μC , -3 μC and -3μC are kept at the vertices A, B and C respectively of an equilateral triangle of side 20 cm. What should be the sign and magnitude of the charge to be placed at mid point (M) of side BC so that charge at A remains in equilibrium.
4. A charge q is placed at the centre of the line joining two equal charges Q. Show that the system of three charges will be in equilibrium if q = -Q/4.
5. In the meter bridge experiment, balance point was observed at J with AJ = l
   (i) The values of R and X were doubled and then interchanged. What would be the new position of balance point?
   (ii) If the galvanometer and battery are interchanged at the balanced position, how will the balance point get affected?

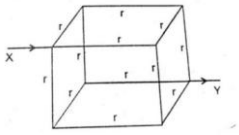


6. Define relaxation time of the electrons drifting in a conductor. How is it related to the drift velocity of free electrons? Use this relation to deduce the expression for electrical resistivity of the material. Use this relation to deduce the expression for electrical resistivity of the material.
7. n identical cells each of emf E and internal resistance r are connected in series to a resistor R.
   (a) Deduce an expression for the internal resistance r of one cell in terms of the current I flowing through the circuit.
   (b) How does the internal resistance of the cell vary with temperature?
8. (a) Derive an expression for electric fielddue to an electric dipole at a point on its equatorial axis.
   (b) Is it necessary for the electric field to be zero at a point, where electric potential is zero? Justify.
9. Two capacitors of capacitance 10 μF and 20 μF are connected in series with a 6 V battery. After the capacitors are fully charged, a slab of dielectric constant (K) is inserted between the plates of the two capacitors. How will the following be affected after the slab is introduced?
   (i) the electric field energy stored in the capacitors.
   (ii) the charges on the two capacitors.
   (iii) the potential difference between the plates of the capacitors. Justify your answer.
10. State Gauss' law. Use it to deduce an expression for the electric field due to a uniformly charged thin spherical shell at points (i) inside, and (ii) outside the shell. Plot a graph showing variation of electric field as a function of r, when r < R and r > R, (r being the distance from the centre of the shell).
11. Derive an expression for the energy stored in a parallel plate capacitor. On charging a parallel plate capacitor to a potential V, the spacing between the plates is halved, and a dielectric medium of E_r = 10 is introduced between the plates, without disconnecting the d.c. source. Explain, using suitable expressions, how the (i) capacitance, (ii) electric field and (iii) energy density of the capacitor change.

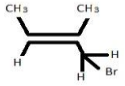
12. State the principle of potentiometer. Draw a circuit diagram used to compare the e.m.fs. of two primary cells. Write the formula used. How can the sensitivity of a potentiometer be increased?

OR

State Kirchhoff's laws. Wires each having equal resistance r are joined to form a cube as shown in the figure. Find the equivalent resistance between the diagonally opposite points X and Y.



CHEMISTRY

1. Write IUPAC name of 

2. Draw the structure of 2- Methylpropan -2-ol molecule.
3. Answer the following questions:
   (a) What are the main constituents of dettol?
   (b) How do antiseptics differ from disinfectants?
4. Complete the following reaction of:
   (i) $C_6H_5N_2Cl + KI \longrightarrow$
   (ii) $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{Peroxide}}$
5. (a)Write the main structural difference between DNA & RNA.
   (b)What is meant by denaturation of proteins ?
6. Give the structure of A, B and C in the following reaction;
   (i) $C_6H_5N_2Cl \xrightarrow{CuCN} A \xrightarrow{H_2O/H+} B \xrightarrow{NH_3,\triangle} C$
   (ii) $C_6H_5NO_2 \xrightarrow{Sn+HCl} A \xrightarrow{NaNO_2+Hcl} B \xrightarrow{H_2O/H+} C$
7. Write the names and structures of the monomers of the following polymers;(a)Buna-S (b)Neoprene (c) Nylon-6,6.
8. Account for the following:
   (i) The boiling points of ethers are lower than isomeric alcohols .
   (ii) Ortho-nitrophenol is more acidic than ortho methoxyphenol .
   (iii) Preparation Of ethers by acid dehydration of secondary or tertiary alcohols is not a suitable method.
9. Rearrange the compound of each of the following sets in order of reactivity towards S_N2 displacement
   (i) 2-Bromo -2- methylbutane, 1- Bromopentane, 2- Bromopentane
   (ii) 1-Bromo -3- methylbutane, 2- Bromo-2- methylbutane,3-Bromo-2- methylbutane
   (iii) 1-Bromobutane, 1-Bromo-2, 2- dimethylpropane, 1-Bromo-2-methylbutane, 1-Bromo -3- methyl butane.
10. An Organic compound A (C_3H_6O) is resistant to Oxidation but forms compound B (C_3H_8O) on reduction 'B reacts with HBr to form the compound 'C' , C with Mg forms Grignard reagent D which reacts with 'A' to form a product which on hydrolysis is E. Identify A to 'E' .

BIOLOGY

1. Describe the events of oogenesis with the help of a schematic representation. Write two differences between spermatogenesis and oogenesis.
2. Explain with the help of a diagram the development of a mature embryo sac from a megaspore mother cell in angiosperm.
3. a. STDs are a threat to reproductive health. Describe any two such diseases and suggest preventive measures.
   b. Mention two inherent characteristics of *Amoeba* and yeast that enable them to reproduce asexually.
4. Prepare the investigatory project report.

PHYSICAL EDUCATION

1. Enlist aims and objectives of Intramurals.
2. What is a Bye?
3. Define Planning in Games and Sports.
4. What role an individual can play in improvement of sport environment?
5. Being sports captain of the school, prepare five important committees with their responsibilities to conduct annual sports day.
6. 'Games and sports are the best means for attaining fitness.'' Justify.
7. What is the role of various elements of diet on performance of an athlete?

Computer Science (In Practical File)

Programming in C++ using functions

1. Write a program to define a function to interchange the value of two integers without using extra variable. Use the concept of call by reference so that the exchanged value can be displayed through main program.
2. Write a function which will take a string and return the length of the string without the use of built-in functions.
3. Write an interactive C++ program to accept an integer and convert it into an equivalent binary.
4. Write a program to define a function to generate prime numbers from 1 to N, where the value of N must be supplied as argument.
5. Write a program to print the following pattern:

```
                1
              1 2 1
            1 2 3 2 1
          1 2 3 4 3 2 1
        1 2 3 4 5 4 3 2 1
      1 2 3 4 5 6 5 4 3 2 1
    1 2 3 4 5 6 7 6 5 4 3 2 1
  1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1
```

6. Write a program to define a function which accepts two strings and the concatenate string without using built-in functions.
7. Define a structure Student with the following specifications:
   Roll_no (integer), St_Name(array of characters of size 20), St_Class (array of characters of size 5), Marks (array of integers of size 5), Percentage (float), Calculate ()to calculate overall percentage marks & returns the percentage
   Readdata () read details of student&invoke the calculate function; Displaymarks () prints the data.
   Write a program to enter and show the details of 5 such records.