SURAJ SCHOOL

SURAJ EDUCATION

Holidays Homework

CLASS - 12th NM

English

Prepare all these in a A4 size sheet and compile them in a file.

Q.1 Write **Notices** on the following occasions **(three of each category)**

a. Tours
b. Sports
c. Cultural/Extra-curricular activities
d. Lost & Found
e. Appeals

Q.2. Write **Formal letters** on the following topics **(Two of each category)**

a. Complaint
b. Editor
c. Placing order
d. Enquiry
e. Job Application

Q.3 Write **Articles** on the following topics (**Do no any 2 topics)**

a. My vision of future India
b. Digital education in India
c. Women safety in India
d. 50-years of Earth Day

Q.4 Read all the poems and Write down their ***Poetic Devices,Summary and Theme***.

Hope you all have a great holiday and make sure to keep yourself safe.👍☺👍

Physical Education

Q- Draw a fixture of 11 volleyball teams on knockout basis?

Q- Draw a fixture of 24 teams.

Q- Draw a fixture of 6 teams on league basis following the cyclic method.

Q- Draw a fixture of 9 teams on league basis following the staircase method.

Q- Draw a fixture of 7 teams on league basis following the tabular method.

Q- Explain any deformities and corrective measures of them.

Q- write short note on Female Athlete Triad.

Q- Anyone one IOA recognized sports/Game of choice. Labelled diagram of field and equipment

Physics

Q1.Two identical circular wires P and Q each of radius R and carrying current 'I' are kept in perpendicular planes such that they have a common centre as shown in the figure. Find the magnitude and direction of the net magnetic field at the common centre of the two coils

Q2.A particle of mass 10-3 kg and charge 5 pC enters into a uniform electric field of 2 x 105 NC-1, moving with a velocity of 20 ms-1 in a direction opposite to that of the field. Calculate the distance it would travel before coming to rest.

Q3.A steady current (11) flows through a long straight wire. Another wire carrying steady current (12) in the same direction is kept close and parallel to the first wire. Show with the help of a diagram how the magnetic field due to the current 11 exerts a magnetic force on the second wire. Write the expression for this force.
Q4.) Two point charges qA = 3 μC and qB= 3 μC are located 20 cm apart in a vacuum. (i) What is the electric field at the midpoint O of the line AB joining the two charges? (ii) If a negative test charge of magnitude 1.5 x 10-9 C is placed at this point, what is the force experienced by the test charge?

Q5.Consider a uniform electric field E = 3×103îN/C. (a) What is the flux of this field through a square of 10 cm on a side whose - plane is parallel to the y z - plane? (b) What is the flux through the same square if the normal to its plane makes a 60° angle with the x-axis?

Q6A spherical conductor of radius 12 cm has a charge of 1.6 x 10-7C distributed uniformly on its surface. What is the electric field (1) inside the sphere? (2) just outside the sphere? (3) at a point 18 cm from the centre of the sphere?

Q7.Drive formula of capacitance for parallel plate capacitor.

Q8.Explain whetstone bridge and drive its balance condition.

Q9. Derive an expression for the resistivity of a good conductor, in terms of the relaxation time of electrons
Q10.An ammeter of resistance 1 can measure current up to 1.0 A (i) What must be the value of the shunt resistance to enable the ammeter to measure up to 5.0 (A)? (ii) What is the combined resistance of the ammeter and the shunt?

SURAJ Group of Schools

SURAJ EDUCATION

Name :.....

Add. No.. : .....

Class: XII

Subject: Chemistry

Holiday homework

General Instructions:-

- *All questions are compulsory.*

Q.1 An Azeotropic solution of two liquid has boiling point lower than either of them when it :

(A) Is saturated

(B) Shows positive deviation from Raoults law

(C) Shows negative deviation from Raoults law

(D) Shows no deviation from Raoults law

Q.2 During electrolysis of aqueous solution of NaCl :

(A) H_2 (g) is liberated at cathode. (B) Na is formed at cathode.

(C) O_2 (g) is liberated at anode. (D) Cl_2 is liberated at cathode.

Q.3 For the reaction A + 2B → C, rate is given by R = [A] $[B]^2$ then the order of the reaction is

(A) 3 (B) 6 (C) 5 (D) 7

Q.4 **Assertion :** When NaCl is added to water a depression in freezing point is observed.

Reason : The lowering of vapour pressure of a solution causes depression in the freezing point

In these question two statements are given — one labelled as Assertion (A) and the other labelled Reason (R). Select the most appropriate answer from the options given below:

(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.

Q.5 Define Azeotropic mixture and give their types with example .

Q.6 ***(i)*** Why does the conductivity of a solution decrease with dilution?

(ii) Why a mercury cell gives a constant voltage throughout its life ?

Q.7 The conversion of the molecules X to Y follows second order kinetics . If the concentration X is increased to three times how will it affect the rate of formation of Y.

Q.8 Boiling point of water at 750 mm Hg is 99.63°C. How much sucrose is to be added to 500 g of water such that it boils at 100°C. Molal elevation constant for water is 0.52K Kg mol^{-1}

Q.9 The resistance of a conductivity cell containing 0.001M KCl solution at 298 K is 1500 Ω. What is the cell constant if the conductivity of 0.001M KCl solution at 298 K is 0.146×10^{-3} S cm^{-1}

Or

How much electricity in terms of Faraday is required to produce

(i) 20.0 g of Ca from molten $CaCl_2$?

(ii) 40.0 g of Al from molten Al_2O_3?

Q.10 The spontaneous flow of the solvent through a semipermeable membrane from a pure solvent to a solution or from a dilute solution to a concentrated solution is called osmosis. The phenomenon of osmosis can be demonstrated by taking two eggs of the same size. In an egg, the membrane below the shell and around the egg material is semipermeable. The outer hard shell can be removed by putting the egg in dilute hydrochloric acid. After removing the hard shell, one egg is placed in distilled water and the other in a saturated salt solution. After some time, the egg placed in distilled water swells-up while the egg placed in salt solution shrinks. The external pressure applied to stop the osmosis is termed as osmotic pressure (a Colligative property). Reverse osmosis takes place when the applied external pressure becomes larger than the osmotic pressure.

(i) What do you expect to happen when red blood corpuscles (RBC's) are placed in 0.5% NaCl solution?

(ii) Which one of the following will have higher osmotic pressure in 1 M KCl or 1 M urea solution?

(iii) Define term osmosis and osmotic pressure?

OR

(iii) Write van't Hoff equation for dilute solution.

Q.11 (a) Define the following terms :

(i) Ideal solution (ii) Henry's law

(b) Calculate the boiling point elevation for a solution prepared by adding 10 g $CaCl_2$ to 200 g of water, assuming that $CaCl_2$ is completely dissociated.

(Kb) for water = 0.512 K kg mol-1; Molar mass of $CaCl_2$ = 111 g mol^{-1})

OR

(i) Define the following terms:

(*a*) Molarity

(*b*) Molal elevation constant (K_b)

(*ii*) A solution containing 15 g urea (molar mass = 60 g mol–1) per litre of solution in water has the same osmotic pressure (isotonic) as a solution of glucose (molar mass = 180 g mol–l) in water. Calculate the mass of glucose present in one litre of its solution.

Q.12 ***(i)*** Write anode ,cathode reaction of lead storage battery .

(ii) A voltaic cell is set up at 25°C with the following half cells :

Al/Al^{3+} (0.001 M) and Ni/Ni^{2+} (0.50 M)

[Given $E^oNi^{2+}/Ni = -0.25V, E^oAl^{3+}/Al = -1.66V$]. [log 8 = 0.9031]

Write an equation for the reaction that occurs when the cell generates an electric current and determine the cell potential.

OR

(*i*) State Kohlrausch law of independent migration of ions. Write an expression for the molar conductivity of acetic acid at infinite dilution according to Kohlrausch law.

(*ii*) Calculate Λ_m^0 for acetic acid.

Given that Λ_m^0 (HCl) = 426 S cm^2 mol^{-1}, Λ_m^0 (NaCl) = 126 S cm^2 mol^{-1}

Λ_m^0 (CH_3COONa) = 91 S cm^2 mol^{-1}.

ASSIGNMET
MATHEMATICS

1. **Let f : N → R be a function defined by f(x) = $4x^2 + 12x + 15$**

   Show that f : N → S Where S is range of f, is bijective function.

2. **Show that the relation S in the set A = { x ϵ Z : 0≤ x ≤ 12] given by**

   S = { (a, b) : a, b ϵ z, |a – b| is divisible by 4} is an equivalence relation. Find the set of all elements related to 1. Also write equivalence class [2].

3. **Prove the following:-** $cos\left[tan^{-1}\, sin\left(cot^{-1}x\right)\right] = \sqrt{\frac{1+x^2}{2+x^2}}$

4. **Evaluate** $cos^{-1}\left(cos^2\frac{\pi}{3}\right) + sin^{-1}\left(sin^2\frac{\pi}{6}\right)$

5. **The principal value of $\cos^{-1}$(cos (- $\frac{34\pi}{9}$)) is**

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

7. **If A =** $\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ **, Verify that A^2- 4A -5I=O**

8. **Three schools X, Y and Z organized a fete (mala) for collecting funds for flood victims in which they sold hand held fans, mats and toys made from recycled material, the sale price of each being Rs. 25, Rs. 100 and Rs. 50 respectively. The following table shows the number of articles of each type sold**

Articles/School	X	Y	Z
Hand – held fans	30	40	35
Mats	12	15	20
Toys	70	55	75

   Using matrices. Find the funds collected by each school by selling the above articles and the total funds collected. Also write any one value generated by the above situation.

9. **For what value of x, the matrix** $\begin{bmatrix} 5-x & x+1 \\ 2 & 4 \end{bmatrix}$ **is singular.**

10. **Show that the matrix A=** $\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ **satisfies the equation A^2-5A+7I=O. Hence Find A^{-1}**

11. Two schools P and Q wants to award their selected students on the values of discipline, politeness and punctuality. The school P wants to award ` x each, ` y each &` z each for the three respective values to its 3, 2 and 1 students with a total award money of ` 1,000. School Q wants to spend ` 1500 to award its 4, 1 and 3 students on the respective values (by giving the same award money for the three values as before). If the total amount of awards for one prize on each value is `600, using matrices, find the award money for each value. Apart from the above three values suggest one more value for awards.

12. 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 equation

x-y + 2z = 1, 2y-3z = 1, 3x – 2y + 4z = 2

13. If f(x) is continuous at x=0 find the value of a , b and c, f(x) = $\begin{cases} \frac{Sin(a+1)x+Sinx}{x}, if\ x < 0 \\ c \qquad\qquad , if\ x = 0 \\ \frac{\sqrt{x+bx^2}-\sqrt{x}}{bx^{\frac{3}{2}}}, if\ x > 0 \end{cases}$

14. Differentiate $\tan^{-1}\left(\frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{\sqrt{1+x^2}+\sqrt{1-x^2}}\right)$ w.r.t $Cos^{-1}x^2$

15. If $y = Cosec^{-1}x$, $x > 1$ then show that $x(x^2-1)\frac{d^2y}{dx^2} + (2x^2-1)\frac{dy}{dx} = 0$

16. If x = a(Cost + tSint) and y = a(Sint – tCost) , $0 < t < \frac{\pi}{2}$. Find $\frac{d^2x}{dt^2}$, $\frac{d^2y}{dx^2}$ and $\frac{d^2y}{dt^2}$

17. Sand is pouring from a pipe at the rate of $12cm^3$/sec. The falling sand forms a cone on the ground in such a way that the height of the cone is always one sixth of the radius of the base. How fast is the height of the sand-cone increasing when the height is 4cm.

18. Find the values of x for which $f(x) = [x(x-2)]^2$ is an increasing function. Also find the points on the curve, where the tangent is parallel to the x-axis.

19. An open tank with a square base and vertical sides is to be constructed from a metal sheet so as to hold a given quantity of water. Show that the cost of the material will be the least when the depth of the tank is half of its width.

20. A window has the shape of a rectangle surmounted by an equilateral triangle. If the perimeter of the window is 12m, find the dimensions of the rectangle that will produce the largest area of the window.