



R.E.D. Group of Schools

Summer Holidays Homework Framework

SESSION: 2023-24

CLASS – 12th

Subject: English

Text Book: Flamingo, Vistas and BBC Compacta

Syllabus Covered upto MAY END

Book Flamingo

- Chapter No.1 Chapter Name- The Last Lesson
- Chapter No.- 2 Chapter Name-Lost Spring
- Poem 1 Poem Name- My Mother at Sixty-six
- Poem 3 Poem Name – Keeping Quiet
- Chapter No. 3 Chapter Name- Deep Water
- Chapter No. 4 Chapter Name- The Rattrap

Book Vistas

- Chapter No. 1 Chapter Name – The Third Level
- Chapter No. 4 Chapter Name- The Enemy

2. List of all new concepts taught upto MAY END (Grammar Topics)

- Chapter No. Chapter Name- Reading Comprehension
- Chapter No. Chapter Name- Notice Writing
- Chapter No. Chapter Name- Invitations and Replies
- Chapter No. Chapter Name- Formal Letters

3. Tools required for doing Homework:

- Reader Book
- Notebook
- Scrap Book
- Resources as per activity

4. Date of Submission of Homework: 3rd July, 2023

Category 9-12

5. Instruction/Guidelines for Formative Assessment based Homework:

- **Section-A-Reading and Vocabulary Homework**

➤ Each student will read :

Fictional work: The Old Man and the Sea by Ernest Hemingway

Non-fiction: Restless Days, Sleepless Nights by RanjanaBharj

Write review of both the works separately using the following steps

➤ **Note: - Do the following homework in scrap book**

- ✓ Draw creative page as front page
- ✓ Identify and list the Main characters in the Book
- ✓ Write the summary of the story as follows :—
 - ❖ Beginning
 - ❖ Middle
 - ❖ End
- ✓ Write your favourite part of the story
- ✓ Mention anything you disliked about the book
- ✓ Book rating out of 5 and why
- ✓ If you were the author how will you end the story

2. Read any English newspaper once in a week and find out 5 new words from it & frame a sentence from it and present them in the same scrap book

Vocabulary Homework

- Make your own dictionary.(Each student will learn 3 new words daily with meanings and write the words in dictionary)

Total 45 words should be included in your dictionary

○ **Section-B- Speaking Homework**

1. Students will practice on one of the given topics :-

- “ The limit of my language is the limit of my world”

OR

- Poverty and mental health

OR

- Mother- daughter relationship

Students will prepare speaking activity video on any one of the above topics and share with English teachers on WhatsApp group

○ **Section-C-Creative Writing Homework**

Creative Writing Homework

Travelogue writing: There are many tourist attractions. They are popular for many reasons. Some places are popular for their natural beauty whereas others are for their historical and religious importance. Write the names of the places that you would like to visit in our country naturally beautiful places, places of historical and religious importance. Have you ever visited such places on your holidays? Write down the places you have visited so far. Write detailed description of a visited place in the form of a paragraph.

- **Character portrait/ sketch writing** of your favourite character from the novel “The Guide” by R.K. Narayan on A4 size sheet.

➤ **Review writing: On a movie “ Three idiots”**

○ **Section-D-** Learning and Pre reading Homework

1. **Pre- reading:** Poem No. -4 , A Thing of Beauty

Poem No.; -5, A Roadside Stand

Learning : Book Flamingo

- Chapter No. 1 Chapter Name- The Last Lesson
- Chapter No.- 2 Chapter Name- Lost Spring
- Poem 1 Poem Name- My Mother at Sixty-six
- Poem 3 Poem Name – Keeping Quiet
- Chapter No. 3 Chapter Name- Deep Water
- Chapter No. 4 Chapter Name- The Rattrap
- Book Vistas
- Chapter No. 1 Chapter Name – The Third Level
- Chapter No. 4 Chapter Name- The Enemy
- **Section-E-** Project work

1. **Prepare a student portfolio and include the following details :-**

- Personal details
- What I understand by portfolio
- My goals/ Aim in life for future
- My achievements till now
- The areas I need to work to achieve my goal

Following projects can be given for Grammar Topic covered in the month of April and May:-

2. 12 tenses formula with examples

OR

Verb project chart

OR

Parts of speech and application

3. Grammar flip book with all rules, tips and tricks on Clauses and Conditional sentences

OR

Draw your favorite fiction-character from the book ‘Old man and the Sea’ and describe it using 10 adjectives



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Summer Holidays Homework

SESSION: 2023-24

CLASS – 12th

Subject: PHYSICS

Text Book: S.L. Arora, NCERT

1. Syllabus Covered upto MAY END

- Chapter No.- **01** Chapter Name- **Electric charge and field**
- Chapter No.- **02** Chapter Name-**Electric potential and electric capacitance**
- Chapter No.- **03** Chapter Name- **Current and electricity**
- Chapter No.- **04** Chapter Name- **Magnetic effect of current**

2. List of all new concepts taught upto MAY END

- Force between the charges and their field
- Concept of capacitance and electric potential
- Polarization and dielectric
- Concept of current, Potential difference and EMF
- Combination of cells and resistance
- Magnetic fields of various carrying figures
- Force on a Moving charge particles in magnetic field

3. Formative Assessment based Homework:

- **Section-A**-Creative Project/ Working model/ Inquiry based project.
- **Section-B**-Diagram and Labeling assessment activity.
- **Section-C**-Experiment based activity.
- **Section-D**- Derivations.

4. Summative Assessment based Homework:

- **Section-E**- Chapter-wise Assignments

5. Tools required for doing Homework:

- NCERT Text Book, S.L. Arora book
- Notebook
- A4 Sheets, Internet
- Resources as per activity

6. Instruction/Guidelines for Formative Assessment based Homework:

- **Section-A-Creative Project/ Working model/ Inquiry based project.**

Topic	Roll No.
Make a working project of Periscope	1 to 10
Creating Electric Current with a Magnet	11 to 20
Make Earthquake Alarm Working Model	21 to 30
Solar panel	31 to 40

I. (Roll No. 1 to 10) Topic: Make a working project of Periscope

- **Materials Required:** Two congruent pieces of mirror, cardboard or a PVC pipe, cutter, tape or glue
- **Steps to prepare:**
 - Use cardboard to make three hollow cuboids and arrange them in the shape of a real periscope.
 - Attach the mirror glasses to the opposite corners of the structure at an angle equal to 45° .
 - Hold one end of the periscope on eye level and look at the distant objects easily.

II (Roll No. 11 to 20) Topic: Creating Electric Current with a Magnet

- **Materials Required:-** Coil the large no of turns, 9V volt battery, key, Galvanometer
- **Steps to prepare:**
 - Wind coils using 32 gauge wire (200 turns and 400 turns). Pass a strong magnet through each of the coils.
 - Measure the amount of electricity generated by the magnet moving through the coils by using a galvanoscope.
 - Repeat the procedure by moving the magnets through the coils at different speeds to see the difference in the current generated.

III. Roll No.2 1 to 30) Topic: Make Earthquake Alarm Working Model

- **Materials Required:-** LED light (preferably red), 1 kilo-ohm resistor, Wire, Buzzer, Copper wire, Steel nut, 9v Battery, 9v Battery clip connector, On/Off switch. Cardboard
- **Steps to prepare:**
 - Take a 7cm long copper wire, fold it and twist it. When done, penetrate that through the

perpendicular cardboard, like this.

- Take the steel nut, penetrate a copper wire through the nut and twist it. The nut would act as a pendulum in the model. Fix this steel nut in the model by taking the tail (copper wire tied to the steel nut) and putting it across the small square cardboard. After doing, fix the pendulum in its place using a glue gun. Make sure you penetrate the pendulum across the small knot using copper wire on the perpendicular cardboard piece. Fix this steel nut in the model
- Now, we need to work with the buzzer and the LED light. Firstly, take the 1-kilo ohm resistor and fix it at one end of the LED light. This can be done using a heating mechanism.
- Fix a battery to the battery connector. Using the glue gun, fix the on/off switch, the battery, buzzer and the LED light at the edge of the cardboard base to complete the model. Ensure the switch is kept on to make the model a functional earthquake alarm

IV. Roll No. 31 to 40) Topic: Solar panel

- **Materials Required;-** ferric chloride solution, solder, solder iron, alcohol, and crystal silicon paste.
- **Steps to prepare:**
 - Apply crystal silicon paste over the printed circuit board and leave it to dry.
 - Remove the extra paste from the printed circuit board.
 - Attach the connecting wires to form the positive and negative terminals of the solar panel.
 - Place the set-up in direct sunlight and connect a multimeter across the terminals.
- **Section-B- Diagram and Labeling assessment activity.**
 - Draw well labeled diagrams of the following:
 - Equipotential surface due to 1) point charge 2) dipole 3) Line charge distribution
 - Magnetic field due to current carrying wire
 - Magnetic field due current carrying solenoid
 - Plots Graph electric field vs distance for point charge, line charge and dipole
 - Plots Graph of electric potential vs distance for point charge, line charge and conducting shell
- **Section-C-Experiment based activity.**
 - **Name of the Activity:** Bending Water Static Electricity Experiment
 - **Material Required:** A sink ,A comb or a balloon
 - **Procedure:** We did this impressive science experiment in my fifth grade class, and I have remembered it all these years! This experiment can be done with a comb OR a balloon. Either one will work just fine. Turn on the faucet with a very small stream of water. The smaller, the better, but you do need the water to be running consistently and not just dripping. Then charge either the comb or the balloon by running it through your hair. Hold the comb or the balloon very close to the stream of water, but not touching it.
 - **Observations:**
 - **Conclusion:**
 - **Precautions:**
- **Section-D- Derivations**
 - **Learning Homework:**
 - Derivations
 - 1) Electric field due to dipole on its axial line and equatorial line
 - 2.) Electric field due to a Charged ring on its center and on a point on its axil line
 - 3.) Electric field due to a charged wire of infinite length using Gauss theorem
 - 4.) Electric field due to a conducting hollow shell using Gauss theorem
 - 5.) Combination of cells in series and parallel
 - 6.) Magnetic field due current carrying wire
 - 7.) Magnetic field due to current carrying circular coil on its axil line
 - 8.) Magnetic field due to a solenoid using Ampere circuital law
 - 9.) Derivation of radius, time period, frequency of a charged particle in magnetic field.
- **Section-E-Revision assignment.**



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Revision Assignment - 1

Class: 12th

Ch. Name: Electrostatic Charges & Fields

Subject: Physics

Ch. No.: 1

For recapitulation & solving the assignment the students should refer to their NCERT BOOK, MTG
Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question no. 1, 2,3,4 & 5.

Case Study- 1

From the knowledge of electric intensity (\vec{E}) at any point (\vec{r}), we can calculate the magnitude and direction of force experienced by any charge q_0 held at that point $\vec{f}(\vec{r}) = q_0\vec{E}(\vec{r})$

This is the physical significance of electric field. As against the electric lines of force which are continuous but not closed loops, magnetic lines of force are continuous, endless closed loops.

An electric dipole consists of a pair of equal and opposite point charges separated by some small distance. The dipole moment (\vec{p}) is a measure of strength of electric dipole $\vec{p} = q(2\vec{r})$. The direction of (\vec{p}) is from

negative charge to positive charge. On axial line of electric dipole $|\vec{E}| = \frac{|\vec{p}| 2r}{4\pi \epsilon_0 (r^2 - a^2)^2}$

The direction of \vec{E} is opposite to direction of \vec{p} . On equatorial line of electric dipole, $|\vec{E}| = \frac{|\vec{p}|}{4\pi \epsilon_0 (r^2 + a^2)^{3/2}}$

Q.1 A charge q is held in an electric field of intensity \vec{E} . What is the force on the charge?

- (a) E/q (b) qE (c) q/E (d) None

Q.2. The algebraic sum of charges on an electric dipole is _____.

- (a) $2q$ (b) q (c) 0 (d) None

Q.3. Electric field \vec{E} on axial line of electric dipole is $E \propto r^n$. What is the value of n ?

- (a) -2 (b) -3 (c) 3 (d) -3

Q.4. Give ratio of magnitude of electric intensity due to an electric dipole at a point on equatorial line and on axial line at same distance from center of dipole of electric dipole.

- (a) 2:1 (b) 1:2 (c) 2:3 (d) 3:2

Part-2

Subject Specific conceptual definitions & Application based Questions

Q.4. Define the following terms:-

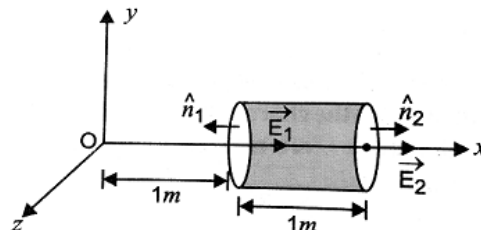
- i) Quantization of charge ii) Electric Dipole
iii) Electric potential energy iv) Dielectric

Q.5. Answer the following:-

- i) Derive an expression for potential energy of an electric dipole in a uniform electric field. In which situation, the potential energy of dipole is (i) maximum and (ii) minimum?
ii) State Gauss's Theorem in electrostatics and deduce coulomb's law from Gauss's theorem.
iii) Using Gauss's theorem, derive an expression for electric field intensity at a point due to
(a) a line of charge. (b) A uniformly charged thin spherical shell.
(c) a charged solid sphere. (d) an infinite plane sheet of charge.
(e) two parallel sheets of charge with charge densities, σ and $-\sigma$.

Q.6. Application based question:-

- (a) A hollow cylindrical box of length 1 m and area of cross section 25 cm^2 is as shown in Fig. The electric field in the region is given by $\vec{E} = 50x\hat{i}$, where E is in NC^{-1} , and x is in metre.



Find –

- (i) Net flux through the cylinder
 - (ii) Charge enclosed by the cylinder.
- (b) An early model for an atom considered it to have a positively charged point nucleus of charge Ze , surrounded by a uniform density of negative charge upto a radius R . The atom as a whole is neutral. For this model, what is the electric field at a distance r from the nucleus?
- (c) (i) Is the force acting between two point charges q_1 and q_2 kept at some distance in air, attractive or repulsive when : (i) $q_1 q_2 > 0$ (ii) $q_1 q_2 < 0$
(ii) Write down the value of absolute permittivity of free space.
(ii) What is the relevance of large value of $K (=81)$ for water?
- (d) (i) A charge q is placed at the centre of a cube of side l what is the electric flux passing through two opposite faces of the cube?
(ii) Two concentric spherical shells of radii R and $2R$ are given charges Q_1 and Q_2 respectively. The surface charge densities of the outer surfaces are equal. Determine the ratio $Q_1 : Q_2$.

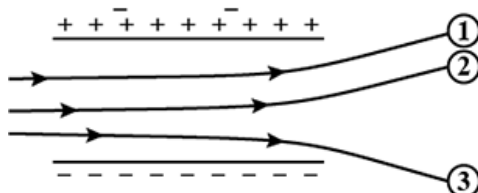
Q.7. Assertion and reason questions:

- (a) Both Assertion and reason are true and reason is correct explanation of assertion
 - (b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
 - (c) If assertion is true but reason is false.
 - (d) If both assertion and reason are false
- i) **Assertion :** Electric dipole moment is a scalar.
Reason : $\vec{p} = q(2a)$
- ii) **Assertion :** No two electric lines of force can intersect each other.
Reason : Because they lie far apart.
- iii) **Assertion :** The value of electrostatic force constant depends on nature of medium separating the charges and also on the system of units.
Reason : In SI, $k = 9 \times 10^9 \text{ Nm}^2 \text{ C}^{-2}$. In CGS system $k = 1$.

Q.8. Conceptual and Mental Ability Based Type Questions)

Answer the following questions

- Q1. (a) A comb run through one's hair attracts small bits of paper. Why? What happens if the hair are wet or if it is a rainy day?
(b) Ordinary rubber is an insulator. But the special rubber tyres of aircrafts are made slightly conducting. Why is this necessary?
(c) Vehicles carrying inflammable materials usually have metallic ropes touching the ground during motion. Why?
(d) A bird perches on a bare high power line, and nothing happens to the bird. A man standing on the ground touches the same line and gets a fatal shock. Why?
- Q2. If two objects repel one another, you know both carry either positive charge or negative charge. How would you determine whether these charges are positive or negative?
- Q3. In coulomb's law in electrostatics valid in all situations?
- Q4. Fig. shows tracks of three charged particles in a uniform electrostatic field. Give the signs of the three charges. Which particle has the highest charge to mass ratio?



- (a) Suppose two particles have identical curved trajectories. Which of the following are necessarily true?
(i) they have same charge (ii) they have same mass
(iii) the charges have the same sign, (iv) they have the same e/m ratio.
- (b) You are given the initial velocity g of a beam particle and the length of the capacitor l . What other measurement would enable one to find e/m ?
- Q5. Two charges of magnitude $-2Q$ and $+Q$ are located at points $(a,0)$ and $(4a,0)$ respectively. What is the electric flux due to charges through a sphere of radius ' $3a$ ' with its centre at the origin.



R.E.D. Group of Schools

Revision Assignment - 2

Class: 12th

Subject: Physics

Ch. Name: Electric Potential And Capacitor

Ch. No.: 2

For recapitulation & solving the assignment the students should refer to their NCERT BOOK, MTG

Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question no. 1, 2,3,4 & 5.

Case Study- 1

A capacitor is an arrangement for storing a large amount of electric charge and hence electric energy in a small space. The capacitance of an isolated conductor is increased considerably by bringing near it an uncharged conductor connected to Earth. This is the principle of capacitor. Such an arrangement of the two conductors separated by a dielectric medium is said to form a capacitor or condenser depending on the shape of conductors, we get parallel plate capacitor, spherical capacitor and cylindrical capacitor. Capacity of a parallel plate capacitor is $C = A\epsilon_0/d$, where A is the area of plates, and d is distance between the two plates of capacitor.

Q.1 When a dielectric medium of relative permittivity K is inserted between the plates of capacitor than capacitance of the capacitor will

- (a) increases. (b) decreases (c) remains constant (d) zero.

Q.2. When condensers are joined in parallel then $C=$

- (a) $C=C_1+C_2$ (b) $C=C_1-C_2$ (c) $C=C_1\times C_2$ (d) $C=1/C_1.C_2$

Q.3. When condensers are joined in series then $C =$

- (a) $C_1 C_2/C_1+C_2$ (b) $C_1+C_2/C_1.C_2$ (c) C_1+C_2 (d) none of above

Q.4. What happens to capacitance of the condenser when the distance between the plates increased

- (a) increases (b)decreases (c) becomes half (d) doubles

Q.5. The amount of energy stored between the plates of capacitor

- (a) $CV^2/2$ (b) $QV/2$ (c) $Q^2V/2$ (d) $C2V$

Part-2

Subject Specific conceptual definitions & Application based Questions

Q.4. Define the following terms:-

- i)Electrostatics ii)Electric Dipole moment.
iii)Electric polarization iv)Electric Capacitance.

Q.5. Differentiate the following:-

- i) Coulomb Law & Gauss Law.
ii) Electric field line & Equipotential surface.
iii) Electric susceptibility & Polarization density.
iv) Electric flux & Electrostatic shielding.

Q.6. Application based question:-

- a) What is the flux through a cube if a Charge Q placed at (i) center (ii) at corner (iii) at center of a face
- b) What is the capacitance of a parallel plate capacitor if a dielectric slab of dielectric constant 3 and thickness x ($x<d$) insert between the plate of capacitor oa area of plate A and distance between the plate is d

- c) What is the work done to move a $2\mu\text{C}$ charge from point $(5\text{m},0)$ to point $(0,3\text{m})$ when a charge of $3\mu\text{C}$ placed at origin

Q.7. Assertion and reason questions:

- (a) Both Assertion and reason are true and reason is correct explanation of assertion
(b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false
- i) **Assertion :** A parallel plate capacitor is connected across battery through a key. A dielectric slab of dielectric constant K is introduced between the plates. The energy which is stored becomes K times.
Reason : The surface density of charge on the plate remains constant or unchanged.
- ii) **Assertion :** Two concentric charged shells are given. The potential difference between the shells depends on charge of inner shell.
Reason : Potential due to charge of outer shell remains same at every point inside the sphere.
- iii) **Assertion :** Electric field is discontinuous across the surface of a spherical charged shell.
Reason : Electric potential is continuous across the surface of a spherical charged shell.

Q.8. Conceptual and Mental Ability Based Type Questions)

Answer the following questions in one word or a sentence.

- Q1. Define electric flux. Write its S.I. unit.
- Q2. Why are electric field lines perpendicular at a point on an equipotential surface of a conductor?
- Q3. A ball of mass 5 g and charge 10^{-7} C moves from point A, whose potential is 500 V , to point B, whose potential is zero. What is the velocity of the ball at point A if, at point B, it is 25 cm per second ?
- Q4. What is Gauss the theorem? Write its mathematical form .
- Q5. Write the expression for energy loss when a charged capacitor C up to potential V connect with another uncharged identical capacitor in parallel
- Q6. Find the potential energy of a system of four particles placed at the vertices square of side 'a' .Also obtain the potential at the center of the square
- Q7A capacitor of capacitance $5.00\ \mu\text{F}$ is charged to 24.0 V and another capacitor of capacitance $6.0\ \mu\text{F}$ is charged to 12.0 V . (a) Find the energy stored in each capacitor. (b) The positive plate of the first capacitor is now connected to the negative plate of the second and vice versa. Find the new charges on the capacitors. (c) Find the loss of electrostatic energy during the process. (d) Where does this energy go?



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Revision Assignment - 3

Class: XII

Ch. Name: Current and electricity

Subject: Physics

Ch. No.: 3

For recapitulation & solving the assignment the students should refer to their NCERT BOOK, MTG
Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question no. 1, 2 & 3.

Case Study- 1

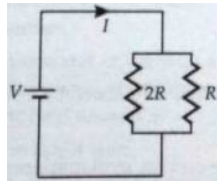
1. Consider a resistor connected to a source of emf the energy of the source gets dissipated entirely in the form of heat. This phenomenon of the production of heat in a resistor by the flow of current through it is called heating effect of current or Joule heating. When a potential difference is applied across the ends of a conductor, its free electrons get accelerated in the opposite direction of the applied field. The speed of the electrons does not increase beyond a constant drift speed. This is because during the course of their motion electrons collide more frequently with the positive metal ions. The kinetic energy gained by the free electrons during the interval of free acceleration is transferred to the metal ions at the time of collision. The ions vibrate more vigorously i.e. the conductor gets heated. The energy supplied by the source of emf appears as heat. According to Joule's law of heating, the amount heat produced is $H = I^2Rt$ joule. Electric heater, electric iron, electric bulb, electric stove, etc.; are the devices which work on this law and convert electric energy into heat energy.

(i) If two identical heaters each rated as (1000 W, 220 V) are connected in parallel to 220 V, then the total power consumed is

- (a) 200 W (b) 2500 W (c) 250 W (d) 2000 W

(ii) Two wires having resistances R and 2R connected in parallel, then ratio of heat generated in R and 2 R is

- (a) 3 : 2
(b) 2 : 1
(c) 1 : 4
(d) 4 : 1



(iii) When 4 equal resistors are connected in series with a battery, they dissipate a power of 10 W. What will be the power dissipated through any of them if it is individually connected across the same battery?

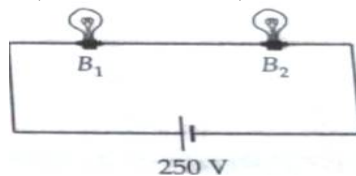
- (a) 40 W (b) 10/3 W (c) 90 W (d) 10 W

(iv) 3 identical bulbs are connected in series and these together dissipate a power P. If now the bulbs are connected in parallel, then the power dissipated will be

- (a) P/3. (b) 3P. (c) 9P (d) P/9

(v) Bulb B1 (100 W – 25v) and bulb B2 (100 W – 200 V) are connected across 250 V. What is potential drop across B2?

- (a) 200 V.
(b) 250 V.
(c) 98 V.
(d) 48 V



Part-2

Subject Specific conceptual definitions & Application based Questions

Q.4. Define the following terms:-

- i) Potential difference ii) Emf iii) Voltmeter iv) Internal resistance

Q.5. Differentiate the following:-

- i) Voltage and ammeter iii) Potential difference and Emf
ii) Ammeter and Galvanometer iv) Series and parallel combinations of cel

Q.6. Application based question:-

Q1. If 3.2×10^{17} electron pass through a wire in 0.5s. Calculate the current through it. Charge on each electron is 1.6×10^{-19} C.

Q2. Explain the term 'drift velocity' of electrons in a conductor. Hence obtain the expression for the current through a conductor in terms of 'drift velocity'.

Q3. Define the term current density of a metallic conductor. Deduce the relation connecting current density (J) and the conductivity (σ) of the conductor, when an electric field E , is applied to it

Q4. State Kirchoff's current law and voltage law

Q.7. Assertion and reason questions:

- (a) Both Assertion and reason are true and reason is correct explanation of assertion
- (b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false

Q.1. Assertion : In a simple battery circuit, the point of the lowest potential is positive terminal of the battery.

Reason : The current flows towards the point of the higher potential, as it does in such a circuit from the negative to the positive terminal..

Q.2. Assertion : A larger dry cell has higher emf.

Reason : The emf of a dry cell is proportional to its size.

Q.3. Assertion : Voltmeter is connected in parallel with the circuit.

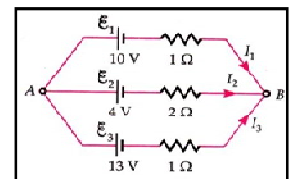
Reason : Resistance of a voltmeter is very large.

Q.8. Conceptual and Mental Ability Based Type Questions)

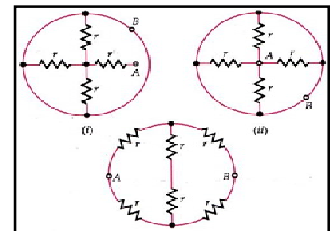
Answer the following questions in one word or a sentence.

1. Two heated wires of the same dimensions are first connected in series and then it's parallel to a source of supply. What will be the ratio of heat produced in the two cases?
2. The storage battery of a car has an emf of 12V. If the internal resistance of the battery is 0.4Ω , what is the maximum current that can be drawn from the battery?
3. Potential difference V is applied across the ends of copper wire of length l and diameter D . What is the effect on drift velocity of electrons if (a) V is doubled
4. (a) Find the current flowing through each cell in the circuit shown in Fig. 3.181.

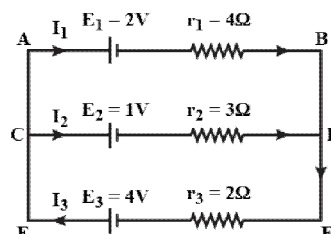
Also calculate the potential difference across the terminal of each cell.



(b) Find the equivalent resistance of the networks shown in Fig. 3.68 between the points A and B.



5. A storage battery of emf 8.0 V and internal resistance 0.5Ω is being charged by a 120 V dc supply using a series resistor of 15.5Ω . What is the terminal voltage of the battery during charging? What is the purpose of having a series resistor in the charging circuit?
6. A current of 2A flows through 2Ω resistor when connected across a battery. The same battery supplies a current of 0.5A when connected across a 9Ω resistor. The internal resistance of the battery is _____.
7. A cell of emf 'E' and internal resistance 'r' is connected across a variable load resistor R. Draw the plots of the terminal voltage V versus (i) R and (ii) the current i. It is found that when $R = 4\Omega$, the current is 1A when R is increased to 9Ω , the current reduces to 0.5 A. Find the values of the emf E and internal resistance r
8. State Kirchoff's rules. Use these rules to write the expressions for the currents I_1 , I_2 and I_3 in the circuit diagram shown.





R.E.D. Group of Schools

Revision Assignment - 4

Class: XII

Subject: Physics

Ch. Name: Magnetic Effect Of Current

Ch. No.: 4

For recapitulation & solving the assignment the students should refer to their NCERT BOOK, MTG

Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question no. 1, 2 & 3.

Case Study- 1

A galvanometer is a device used to detect current in an electric circuit. It cannot as such be used as an ammeter to measure current in a given circuit. This is because a galvanometer is a very sensitive device. It gives a full scale deflection for a current of the order of 10^{-6} A. Moreover for measuring currents. The galvanometer has to be connected in series, and it has a large resistance this will change the value of current in the circuit. To overcome these difficulties. We connect a small resistance R called shunt resistance, in parallel with the galvanometer coil, so that most of the current passes through the shunt. Now to use galvanometer as a voltmeter, it must draw a very small current, otherwise it will appreciably change the voltage which we are measuring. To ensure this a large resistance R is connected in series with the galvanometer.

- Q.1.** A sensitive galvanometer like a moving coil galvanometer can be converted into an ammeter or a voltmeter by connecting a proper resistance to it. Which of the following statements is true?
(a) a voltmeter is connected in parallel and current through it is negligible
(b) an ammeter is connected in parallel and potential difference across it is small
(c) a voltmeter is connected in series and potential difference across it is small
(d) an ammeter is connected in series in a circuit and the current through it is negligible.
- Q.2.** By mistake a voltmeter is connected in series and an ammeter is connected in parallel with a resistance in an electrical circuit. What will happen to the instruments?
(a) Voltmeter is damaged. (b) Ammeter is damaged
(c) Both are damaged. (d) None of the above
- Q.3.** A galvanometer coil has a resistance of 15 Ohm and gives full scale deflection for a current of 4 ma. To convert it to an ammeter of range 0 to 6 A
(a) 10 m ohm resistance is to be connected in parallel to the galvanometer.
(b) 10 m Ohm resistance is to be connected in series with the galvanometer.
(c) 0.1 Ohm resistance is to be connected in parallel to the galvanometer.
(d) 0.1 Ohm resistance is to be connected in series with the galvanometer
- Q.4** Two identical galvanometers are converted into an ammeter and a milliammeter. Resistance of the shunt of milliammeter through which the current passes through will be
(a) more (b) equal (c) less (d) zero
- (v) A voltmeter has resistance of G ohm and range of V volt. The value of resistance used in series to convert it into a voltmeter of range nV volt is
(a) nG (b) $(n-1)G$ (c) G/n (d) $G/n-1$

Part-2

Subject Specific conceptual definitions & Application based Questions

- Q.4. Define the following terms:-**
i) Galvanometer ii) Ammeter iii) Voltmeter iv) List Count
- Q.5. Differentiate the following:-**
i) Voltage and ammeter ii) Ammeter and Galvanometer
iii) Biot Savart law and Coulomb's law iv) Gauss law and Ampere circuital law
- Q.6. Application based question:-**
i. Explain Biot-savarts law in term of
(i) Current density
(ii) Charge and its velocity.
ii. State Ampere's circuital law and prove this law for a circular path around a long current carrying conductor.

- iii. Find the condition under which the charged particles moving with different speeds in the presence of electric and magnetic field vectors can be used to select charged particles of a particular speed.

Q.7. Assertion and reason questions:

- (a) Both Assertion and reason are true and reason is correct explanation of assertion
(b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false
- i. **Assertion (A):** On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed.
Reason (R): The direction of magnetic field around a conductor can be given in accordance with left hand thumb rule.
- ii. **Assertion (A):** The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is inversely proportional to the current flowing through the solenoid.
Reason (R) : The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is directly proportional to the number of turns per unit length of a solenoid.
- iii. **Assertion (A):** A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the magnitude of an electric current in the wire is increased.
Reason (R) : Strength of a magnetic field at a point near the conductor increases on increasing the current.

Q.8. Conceptual and Mental Ability Based Type Questions)

Answer the following questions in one word or a sentence.

1. Proton and a alpha particle enters in a magnetic field with same kinetic energy perpendicular to magnetic field. Find the ratio of their radius .
2. What is the S.I unit and dimensional formula of magnetic permeability.
3. In a current-carrying coil of radius R and having N turns is opened and made into a straight long wire. Then the magnetic field at a distance R would be how many times of the value of the centre of the coil?
4. Find the relation between the magnetic field at R/2 on-axis, and magnetic field at the centre of the coil. Here R is the radius of the coil.
5. Find the force per unit length on two parallel current-carrying conductors.
6. Find the expression for the resistance connected in parallel to convert a galvanometer to an ammeter.
7. Two circular coil of radius in ratio 2: 3 placed perpendicular to each other at a common center. If current in both coil is same then find the
A. Ratio of magnetic field at center
B. Total magnetic field at center
C. Ratio of magnetic moment
8. Range of a galvanometer is 0.5 A and resistance is 10 Ω . What is the value of shunt connected with galvanometer to convert it into a ammeter of range 6A?
9. A current carrying coil of radius R and numbers of turns N convert into a square. Find the ratio of their magnetic moment.

(Section-B)

Lab Manual work

Links from You Tube:

Experiment-1 https://youtu.be/R_j0cFkzDIY

Experiment-2.<https://youtu.be/JTvzP7HrMxU>

Experiment-3 <https://youtu.be/7gllLt-BOL8>

Experiment-4.<https://youtu.be/3jIWIX4dmlI>

Experiment-1. To determine resistivity of two / three wires by plotting a graph for potential difference versus current.

Experiment-2. To find resistance of a given wire / standard resistor using metre bridge.

Experiment-3. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.

Experiment-4. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.

(Do this work in Practical file)

NOTE: Holiday Homework will not be accepted after the assigned date.



R.E.D. GROUP OF SCHOOLS

SUMMER HOLIDAYS HOMEWORK (SESSION: 2023-24)

CLASS – 12th

Subject: Chemistry

Text Book: NCERT book

1. Syllabus Covered up to MAY END

- Chapter No.2 Chapter Name- Solutions
- Chapter No.3 Chapter Name- Electrochemistry.
- Chapter No.4 Chapter Name- Chemical kinetics
- Chapter No.10 Chapter Name Haloalkanes and Haloarenes
- Chapter No. 8 Chapter name: D and f block elements

2. List of all new concepts taught up to MAY END

- Colligative properties
- Concentration Terms
- Abnormal molar mass
- Electrolysis and its product
- Electrochemical cell
- Nernst equation
- Fuel cell
- Primary and secondary cell
- Preparation of Haloalkanes and Haloarenes
- De-Hydro-halogenation reaction along with Zaitsev rule
- Nucleophilic substitution reaction and mechanism
- Physical properties of transition elements
- Transition elements

3. Formative Assessment based Homework:

- **Section-A**-Creative Project/ Working model/ Inquiry based project.
- **Section-B**-Diagram and Labeling assessment activity.
- **Section-C**-Experiment based activity.
- **Section-D**- Learning and Pre-reading homework.

4. Summative Assessment based Homework:

- **Section-E** - Chapterwise Revision assignment (Written, Learning & Pre-reading Homework)

5. Tools required for doing Homework:

1. NCERT Book, Pradeep book
2. Notebook
3. A₄ Sheets
4. Resources as per activity

6. Instruction/Guidelines for Formative Assessment based Homework:

Sr.No.	Topic	Roll No.
1	Elevation of boiling point and depression in freezing point	1 to 10
2	A Hydrogen oxygen fuel cell	11 to 20
3	Various factors affecting rate of reaction	21 to 30
4	Nucleophilic substitution reaction of Haloalkanes and Mechanism	31 to last roll no.

Section-A-Creative Project/ Working model/ Inquiry based project.

1. To study the elevation of boiling point and depression in freezing point also include examples from real life (Roll no. 1 to 10)

Material required: - A4 sheets, A Ruler, NCERT Book, A Tape and a box.

Steps to prepare - understand the concept and explain on A4 sheets.

2. To build a hydrogen oxygen fuel cell (Roll no 11 to 20)

Material required: - A4 sheets, A Ruler, NCERT Book, A Tape and a box.

Steps to prepare - understand the concept and explain on A4 sheets.

3. To study various factors affecting rate of reaction (Roll no 21 to 30)

Material required: - A4 sheets, A Ruler, NCERT Book, A Tape and a box

Steps to prepare - understand the concept and explain on A4 sheets.

4. To study about nucleophilic substitution reaction of Haloalkanes and mechanism (Roll no.31 to last roll no.)

Material required: -A4 sheets, A Ruler, NCERTBook, A Tape and a box

Steps to prepare - understand the concept and explain on A4 sheets.

Section-B- Diagram and Labeling assessment activity.

Draw well labelled diagrams of the following:

- Draw a diagram of electrochemical cell of Cu and Ag
- Draw the graphs of zero first and second order reaction

Section C - Experiment based activity

Name of the Activity: To observe how eggshell is protected by tooth paste and learn how tooth reacts to acids and stain

Material Required: egg, toothpaste, coca cola and vinegar.

Procedure: Take four eggs and wash it carefully coat two plain eggs with good amount of toothpaste evenly. And the rest two eggs remain as it is. That means we are not coating these eggs with any other material.

Pick one plain egg and one toothpaste coated egg and drop them in coke filled glasses respectively and wait for 24 hours to see the outcomes.

Observations: Egg shell is the rich source of calcium carbonate whereas Coca-Cola is acidic in nature. When the plain egg dropped in the coke, the acidic contents immediately start reacting with calcium carbonate and forms stains.

On the other hand, the eggs coated with toothpaste, when dropped in the coke and the fluoride in toothpaste build a protective layer between the eggshells and acidic

Conclusion: Fluoride in toothpaste makes the eggshell stronger and protects it from reacting to acidic contents of coke.

Precautions: Wash the egg carefully so that it does not break.

Section-D-Learning and Pre-reading homework.

Learning Homework: Revise All N. C. E. R. T questions

Pre-Reading Homework: Read Ch.9 coordination compounds

Section-E- Revision assignment.



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Revision Assignment – 1

CLASS: 12th

Subject: Chemistry

Chapter Name: Solutions

Chapter No.: 2

Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question

Q. 1 Case Study- 1

The boiling point elevation and the freezing point depression of solutions have a number of practical applications. Ethylene glycol ($\text{CH}_2\text{OH}.\text{CH}_2\text{OH}$) is used in automobile radiators as an antifreeze because it lowers the freezing point of the coolant. The same substance also helps to prevent the radiator coolant from boiling away by elevating the boiling point. Ethylene glycol has a low vapour pressure. We can also use glycerol as an antifreeze. In order for boiling point elevation to occur, the solute must be non-volatile, but no such restriction applies to freezing point depression. For example, methanol (CH_3OH), a fairly volatile liquid that boils only at 65°C is sometimes used as antifreeze in automobile radiators.

Answer the following questions given below: -

- (i) Out of the CH_3OH and $\text{C}_6\text{H}_{12}\text{O}_6$, which is a better reagent for depression in freezing point but not for elevation in boiling point?
- (ii) Will the depression in freezing point be same or different, if 0.1 moles of sugar or 0.1 moles of glucose is dissolved in 1 L of water?
- (iii) 124 g each of the two reagents glycerol and glycol are added in 5 kg water of the radiators in the two cars. Which one is better for a car? Justify your answer.

OR

If the cost of glycerol, glycol and methanol are the same, then what would be the sequence of the economy to use these compounds as antifreeze?

Part-2

(Subject Specific conceptual definitions & Application based Questions)

Q 2. Define the following terms:

- i) Henry law ii) Osmosis iii) Colligative property iv) Van't Hoff factor

Q 3. Differentiate the following:

- i) Ideal and non-ideal solution ii) Positive and negative deviation
iii) Minimum and maximum. Boiling azeotrope iv) Molarity and molality

Q 4. Application based question:

- i) Calculate the osmotic pressure in Pascal's exerted by a solution prepared by dissolving 1.0 g of polymer of mass 185,000 in 450 mL of water at 37°C.
- ii) 19.5 g of CH₂FCOOH is dissolved in 500 g of water. The depression in the freezing point of water observed is 1.0°C. Calculate the Van't Hoff factor and dissociation constant of fluoroacetic acid.
- iii) What concentration of nitrogen should be present in a glass of water at room temperature? Assume a temperature of 25°C, a total pressure of 1 atmosphere and mole fraction of nitrogen in air of 0.78. (K_H for nitrogen = 8.42×10^{-17} M/mm Hg).
- iv) What happen when cell is placed in
 - a) 0.5% NaCl solution
 - b) 1.5% NaCl solution

Q 5. Assertion and reason questions:

- i) **Assertion:** The molarity of a solution in liquid state changes with temperature.
Reason: The volume of a solution changes with a change in temperature.
 - (a) Both Assertion and reason are true and reason is correct explanation of assertion.
 - (b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
 - (c) If assertion is true but reason is false.
 - (d) If both assertion and reason are false.
- ii) **Assertion:** When NaCl is added to water a depression in the freezing point is observed.
Reason: The lowering of the vapour pressure of a solution causes depression at the freezing point.
 - (a) Both Assertion and reason are true and reason is correct explanation of assertion.
 - (b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
 - (c) If assertion is true but reason is false.
 - (d) If both assertion and reason are false.

Q 6. What is van't Hoff factor for NaCl, Aluminum chloride?

Q 7. What is Anoxia?

Q 8. Why aquatic organism feels more comfortable in cold water?



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Revision Assignment –2

CLASS: 12th

Chapter Name: Electrochemistry

Subject: Chemistry

Chapter No.- 3

Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question

Q. 1 Case Study- 1

All chemical reactions involve interaction of atoms and molecules. A large number of atoms/molecules are present in a few gram of any chemical compound varying with their atomic/molecular masses. To handle such large number conveniently, the mole concept was introduced. All electrochemical cell reactions are also based on mole concept. For example, a 4.0 molar aqueous solution of NaCl is prepared and 500 mL of this solution is electrolysed. This leads to the evolution of chlorine gas at one of the electrode. The amount of products formed can be calculated by using mole concept.

The following questions are multiple choice questions. Choose the most appropriate answer:

- (i) The total number of moles of chlorine gas evolved is
(a) 0.5 (b) 1.0 (c) 1.5 (d) 1.9
- (ii) If cathode is a Hg electrode, then the maximum weight of amalgam formed from this solution is
(a) 300g (b) 446 g (c) 396 g (d) 256 g
- (iii) The total charge (coulomb) required for complete electrolysis is
(a) 186000 (b) 24125 (c) 48296 (d) 193000
- OR
- (iv) In the electrolytes, the number of moles of electrons involved are
(a) 2 (b) 1 (c) 3 (d) 4

Part-2

(Subject Specific conceptual definitions & Application based Questions)

Q 2. Define the following terms:

- (a) Electrolytic cell (b) Molar conductivity (c) Kohlrausch law
(d) Fuel cells (e) Faraday laws

Q 3. Differentiate the following:

- (a) Galvanic and Electrolytic cell (b) Primary and secondary cell

Q 4. Application based question:

- a) The molar conductivity of a 1.5 M solution of an electrolyte is found to be $138.9 \text{ S cm}^2 \text{ mol}^{-1}$. Calculate the conductivity of this solution
- b) The conductivity of 0.001 M acetic acid is $4 \times 10^{-5} \text{ S/cm}$. Calculate the dissociation constant of acetic acid, if molar conductivity at infinite dilution for acetic acid is $390 \text{ S cm}^2/\text{mol}$.
- c) Calculate the time to deposit 1.27 g of copper at cathode when a current of 2A was passed through the solution of CuSO_4 .

Q 5. Assertion and reason questions:

Choose the correct one from. Following option

- (a) Both Assertion and reason are true and reason is correct explanation of assertion.
(b) Both Assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

Assertion: Conductivity of all electrolytes decreases on dilution.

Reason: On dilution number of ions per unit volume decreases.

Assertion: Λ_m for weak electrolytes shows a sharp increase when the electrolytic solution is diluted.

Reason: For weak electrolytes degree of dissociation increases with dilution of solution.



R.E.D. GROUP OF SCHOOLS

Revision Assignment –3

CLASS: 12th

Chapter Name: Chemical Kinetics

Subject: Chemistry

Chapter No.- 4

Part-1

(Case Study Question/Activity based Question)

Instruction: Read the following passage and answer the question

Q.1 Case Study- 1

The half-life of a reaction is the time required for the concentration of reactant to decrease by half, i.e., $[A]_t = [A]/2$. For first order reaction, $t_{1/2} = 0.693/k$ this means $t_{1/2}$ is independent of initial concentration. Figure shows that typical variation of concentration of reactant exhibiting first order kinetics. It may be noted that though the major portion of the first order kinetics may be over in a finite time, but the reaction will never cease as the concentration of reactant will be zero only at infinite time.

The following questions are multiple choice question. Choose the most appropriate answer:

Q1. For the half-life period of a first order reaction, which one of the following statements is generally false?

- (a) it is independent of initial concentration (b) It is independent of temperature.
(c) it decreases with the introduction of a catalyst. (d) None of these.

Q2. The rate constant for a first order reaction is $7.0 \times 10^{-4} \text{ s}^{-1}$. If initial concentration of reactant is 0.080 M, what is the half-life of reaction?

- (a) 990 s (b) 79.2 s (c) 12375 s (d) $10.10 \times 10^{-4} \text{ s}$

Q3. A reaction's rate constant is $k = 3.28 \times 10^{-4} \text{ s}^{-1}$. Determine the reaction's order.

- (a) First order (b) Second order (c) Third order (d) Fourth order

Q.2 Define the following terms: -

- a) Activation Energy c) Pseudo first order reaction
b) Half-life d) Rate constant

Q3 Differentiate the following:

- a) Order and Molecularity b) zero and first order reaction

Q.4 Application based question: -

- a) Explain effect of temperature and catalyst on rate of reaction with graphs
b) A first-order reaction is 50 percent complete in 30 minutes. Calculate the time taken for completion of 87.5 percent of the reaction.
c) How many times will the rate of the elementary reaction $3X + Y \rightarrow X_2Y$ change if the concentration of the substance X is doubled and that of Y is halved?

Q5 Assertion and reason questions:

Choose the correct one from. Following option

(a) If both Assertion and Reason are correct and Reason is correct explanation of Assertion.

(b) If both Assertion and Reason are correct but R is not the explanation of Assertion.

(c) If Assertion is correct Reason is wrong.

(d) If Assertion is wrong Reason is correct.

1. Assertion: Precipitation of silver chloride occurs instantaneously by mixing aqueous solution of silver nitrate and sodium chloride.
Reason: Ionic reactions occur very fast
2. Assertion: Order and molecularity are same.
Reason: Order is determined experimentally and molecularity is the sum of the stoichiometric coefficient of rate determining elementary step.



R.E.D. GROUP OF SCHOOLS

Revision Assignment –4

CLASS: 12th

Subject: Chemistry

Chapter Name- Haloalkanes and Haloarenes

Chapter No.- 10

Part 1 Case based question

Nucleophilic substitution reactions are of two types; substitution nucleophilic bimolecular (S_N2) and substitution nucleophilic unimolecular (S_N1) depending on molecules taking part in determining the rate of reaction. Reactivity of alkyl halide towards S_N1 and S_N2 reactions depends on various factors such as steric hindrance, stability of intermediate or transition state and polarity of solvent. S_N2 reaction mechanism is favoured mostly by primary alkyl halide or transition state and polarity of solvent, S_N2 reaction mechanism is favoured mostly by primary alkyl halide then secondary and then tertiary. This order is reversed in case of S_N1 reactions.

Answer the following questions given below:

(i) Which of the following is most reactive towards nucleophilic substitution reaction?

- (a) C_6H_5Cl (b) $CH_2=CHCl$ (c) $ClCH_2CH=CH_2$ (d) $CH_3CH=CHCl$

(ii) Isopropyl chloride undergoes hydrolysis by

- (a) S_N1 mechanism (b) S_N2 mechanism
(c) S_N1 and S_N2 mechanism (d) neither S_N1 nor S_N2 mechanism

(iii) The most reactive nucleophile among the following is

- (a) CH_3O^- (b) $C_6H_5O^-$ (c) $(CH_3)_2CHO^-$ (d) $(CH_3)_3CO^-$

Q2 Define the following

- a) Ambident nucleophile
b) Wurtz reaction
c) Frankenstein reaction

Q3 Differentiate the following

- a) S_N1 and S_N2 Mechanism

Q4 Application based question: -

- a) How will you bring about the following conversions?
i. Ethane to bromo-ethene
ii. But-1-ene to but-2-ene
- b) A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives a single monochloro compound C_5H_9Cl in bright sunlight. Identify the hydrocarbon.
- c) Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and identify the major alkene:
iii. 1-Bromo-1-methylcyclohexane
iv. 2-Chloro-2-methylbutane
- d) Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH.
- e) p-dichlorobenzene has higher m.p. and lesser solubility than those of o- and m-isomers. Discuss.

Q5 Assertion and reason questions:

Choose the correct one from the following option

- (a) If both Assertion and Reason are correct and Reason is correct explanation of Assertion.
(b) If both Assertion and Reason are correct but R is not the explanation of Assertion.
(c) If Assertion is correct Reason is wrong.
(d) If Assertion is wrong Reason is correct.

1. Assertion : Butan-2-ol is optically active.
Reason : Its mirror image is non-superimposable on it.
2. Assertion : The presence of a nitro group facilitates nucleophilic substitution reaction in aryl halides.
Reason : The intermediate carbanion is stabilized due to presence of the nitro- group.



R.E.D. GROUP OF SCHOOLS

Revision Assignment –5

CLASS: 12th

Subject: Chemistry

Chapter Name- D and F block elements

Chapter No.- 8

1. Read the passage given below and answer the following questions:

The transition elements have incompletely filled d-subshells in their ground state or in any of their oxidation states. The transition elements occupy position in between s- and p-blocks in groups 3-12 of the Periodic table. Starting from fourth period, transition elements consists of four complete series: Sc to Zn, Y to Cd and La, Hf to Hg and Ac, Rf to Cn. In general, the electronic configuration of outer orbitals of these elements is $(n - 1) d^{1-10} ns^{1-2}$. The electronic configurations of outer orbitals of Zn, Cd, Hg and Cn are represented by the general formula $(n - 1)d^{10} n^2$. All the transition elements have typical metallic properties such as high tensile strength, ductility, malleability. Except mercury, which is liquid at room temperature, other transition elements have typical metallic structures. The transition metals and their compounds also exhibit catalytic property and paramagnetic behaviour. Transition metal also forms alloys. An alloy is a blend of metals prepared by mixing the components. Alloys may be homogeneous solid solutions in which the atoms of one metal are distributed randomly among the atoms of the other

(i) Which of the following characteristics of transition metals is associated with higher catalytic activity?

- (a) High enthalpy of atomisation (b) Variable oxidation states
(c) Paramagnetic behaviour (d) Colour of hydrated ions

(ii) Transition elements form alloys easily because they have

- (a) same atomic number (b) same electronic configuration
(c) nearly same atomic size (d) same oxidation states.

(iii) The electronic configuration of tantalum (Ta) is

- (a) $[Xe]4f^05d^16s^2$ (b) $[Xe]4f^{14}5d^26s^2$
(c) $[Xe]4f^{14}5d^36s^2$ (d) $[Xe]4f^{14}5d^46s^2$

(iv) Which one of the following outer orbital configurations may exhibit the largest number of oxidation states?

- (a) $3d^54s^1$ (b) $3d^54s^2$
(c) $3d^24s^2$ (d) $3d^34s^2$

(v) Which one of the following outer orbital configurations may exhibit the smallest number of oxidation states?

- (a) $3d^54s^1$ (b) $3d^54s^2$
(c) $3d^24s^2$ (d) $3d^34s^2$

Q2 Define the following

- a) Transition elements b) Paramagnetic substance

Q3 Application based question: -

Explain giving reason:

- (a) Transition metals and many of their compounds show paramagnetic behaviour.
- (b) The enthalpies of atomisation of the transition metals are high.
- (C) Describe briefly the following physico-chemical properties of transition metals
 - (i) Metallic character
 - (ii) Complex formation.
- (d) Copper (I) is diamagnetic whereas copper (II) is paramagnetic. Explain.
- (e) The colour of a solution of $K_2Cr_2O_7$ depends on pH of the solution. Transition elements show variable valencies. What is the reason for it and how is this variation different from that shown by the p-Block elements?
- (f) What happens when
 - (i) $K_2Cr_2O_7$ reacts with acidified solution of KI
 - (ii) SO_2 is passed through an acidic solution of potassium dichromate
 - (iii) $K_2Cr_2O_7$ reacts with sodium chloride in the presence of conc. H_2SO_4 .

Q4 Assertion and reason questions:

Choose the correct one from. Following option

- (a) **If both Assertion and Reason are correct and Reason is correct explanation of Assertion.**
- (b) **If both Assertion and Reason are correct but R is not the explanation of Assertion.**
- (c) **If Assertion is correct Reason is wrong.**
- (d) **If Assertion is wrong Reason is correct.**

1 Assertion : Zinc does not show characteristic properties of transition metals.

Reason : In Zn outermost shell is completely filled.

2. Assertion : The highest oxidation state of chromium in its compounds is +6.

Reason : Chromium atom has only six electrons in ns and (n – 1) d-orbitals

(Section-B)

Lab Manual work

Complete the following experiment in practical file

- 1. To determine the strength and molarity of $KMnO_4$ solution by titration against mohr salt
- 2. To determine the percentage purity of $KMnO_4$ solution by titration against mohr salt
- 3. To determine the strength and molarity of $KMnO_4$ solution by titration against oxalic acid
- 4. To determine the percentage purity of $KMnO_4$ solution by titration against oxalic acid



R.E.D. Group of Schools

Summer Holidays Homework

Session: 2023-24

Class –12th

Text Book: NCERT Text Book

Subject: Mathematics

1. Syllabus Covered upto MAY END

- Chapter No.- 1..... Chapter Name:- Relation and Function
- Chapter No.- 2..... Chapter Name:- I.T.F
- Chapter No.- 3..... Chapter Name:- Matrices
- Chapter No.- 4..... Chapter Name:- Determinants
- Chapter No.- 5..... Chapter Name:- Differentiation

2. List of all new concepts taught upto MAY END

- Number of reflexive relation, Symmetric relation
- Number of one-one function, onto function
- Properties of I.T.F
- Formula to find area of triangle using determinants
- Derivative of a function with respect to another function

3. Formative Assessment based Homework:

- **Section-A**-Creative Project/ Model
- **Section-B**- Problem solving activities.
- **Section-C**- Mental Maths problems.
- **Section-D**- Lab practicals

Section-A-Creative Project/ Models

Topic	Roll .No
1. Equivalence Relation	1 to 8
2. Formulas of I.T.F	9 to 16
3. Matrices (types, notation and properties)	17 to 24
4. Continuity and differentiability	25 to 32
5. Number of solution of system of linear equations by real life examples	33 to 40

Make a project files according to the given topics

o **Section-B- Problem solving activity.**

Solve the following real life based problems.

- Show that the function $f(x) = x^3 - 2x^2 + 2x$, $x \in \mathbb{Q}$ is increasing on \mathbb{Q} .

- The daily profit, P , of an oil refinery is given by

$$P = 8x - 0.02x^2,$$

- where x is the number of barrels of oil refined. How many barrels will give maximum profit and what is the maximum profit?

o **Section-C- Activities related to Mental Maths.**

Mental Maths problems:

Q1. Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?

Q2. Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next?

Q3. Complete the series 1,6,13,22,33,..

Q4. Complete the Series 34,45,56,67.....

Q5. a,b,c are in H.P. if a,b,c are in

Q6. If E is the universal set and $A = B \cup C$, then the set $E - (E - (E - (E - (E - A))))$ is same as the set

Q7. Which one of the following is not a prime number?

- (a) 31 (b) 61 (c) 71 (d) 91

Q8. What least number must be added to 1056, so that the sum is completely divisible by 23?

- (a) 2 (b) 3 (c) 18 (d) 21

Q9. The sum of first five prime numbers is:

- (a) 11 (b) 18 (c) 26 (d) 28

Q10. The smallest 3 digit prime number is:

- (a) 101 (b) 103 (c) 109 (d) 113

➤ **Section-D-Lab Practicals .**

❖ Make the following lab activities in lab manual .

1. A relation R is symmetric but Neither Reflexive Not Transitive.
2. A Function which is One-One but not Onto
3. Continuity at a Point

➤ **Section-E- Revision assignments (Chapter wise assignments).**



R.E.D. Group of Schools

Revision Assignment -1

Class: 12th
Ch. No.: Relation and function

Subject: Maths
Ch. Name: 1

For recapitulation & solving the assignment the students should refer to their NCERT text book of Maths

Part-1

Multiple choice Questions (only one option is correct)

- If R is a relation on the set $A = \{1, 2, 3\}$ given by $R = \{(1, 1), (2, 2), (3, 3)\}$, then R is
 - reflexive
 - symmetric only
 - transitive only
 - equivalence relation
- If a function $f: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = x^2 + 1$, then pre-images of 17 and -3 respectively, are
 - $\emptyset, \{4, -4\}$
 - $\{3, -3\}, \emptyset$
 - $\{4, -4\}, \emptyset$
 - $\{4, -4\}, \{2, -2\}$
- If a function $f: \mathbb{C} \rightarrow \mathbb{C}$ is defined $f(x) = 3x^2 - 1$, where \mathbb{C} is the set of complex numbers, then the pre-images of (-28) are
 - $3, -3$
 - $3i, -3i$
 - $3i$ only
 - $-3i$ only
- If a function $f: [2, \infty) \rightarrow \mathbb{R}$ is defined by $f(x) = x^2 - 4x + 5$, then the range of f is
 - \mathbb{R}
 - $[1, \infty)$
 - $[4, \infty)$
 - $[5, \infty)$
- If function $f: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = \sin x$ and function $g: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $g(x) = x^2$, then $(f \circ g)(x)$ is
 - $x^2 \sin x$
 - $(\sin x)^2$
 - $\sin x^2$
 - $(\sin x)/x^2$

Part - II

(Integer Type Questions)

- The number of bijective functions from set A to itself when A contains 106 elements is
- The maximum number of equivalence relations on the set $A = \{1, 2, 3\}$ are
- Let $E = \{1, 2, 3, 4\}$ and $F = \{1, 2\}$ Then, the number of onto functions from E to F is
- If the set A contains 5 elements and the set B contains 6 elements, then the number of one-one and onto mappings from A to B is

Part - III

(Application Based Questions)

Answer the following questions by applying acquired knowledge, facts, techniques and rules

- State the reason for the relation R in the set $\{1, 2, 3\}$ given by $R = \{(1, 2), (2, 1)\}$ not to be transitive.
- Let $f: \mathbb{R} - \{-4/3\} \rightarrow \mathbb{R}$ be a function given by $f(x) = 4x/(3x+4)$. Show that f is invertible with $f^{-1}(x) = 4x/(4-3x)$
- $F(x) = x + 7$ and $g(x) = x - 7, x \in \mathbb{R}$, find $(f \circ g)(7)$.

Part - IV

(Reason and Numerical Based Questions)

- Let \mathbb{N} be the set of natural numbers and relation R on \mathbb{N} be defined by $R = \{(x, y): x, y \in \mathbb{N}, x + y + 10\}$. Determine whether the above relation is reflexive, symmetric and transitive.
- Let $f: X \rightarrow Y$ be a function. Define a relation R in X given by $R = \{(a, b): f(a) = f(b)\}$. Show that R is an equivalence relation.

Part – V

(Case Study Based Questions)

15. A relation R in a set A is called Reflexive: if $(a, a) \in R$, for every $a \in A$ Symmetric: if $(a_1, a_2) \in R$, implies that $(a_2, a_1) \in R$, for all $a_1, a_2 \in R$ Transitive: if $(a_1, a_2) \in R, a_2, a_3 \in R$ implies that $a_1, a_3 \in R$ for all $a_1, a_2, a_3 \in A$.

Based on the above information, answer the following questions

1. Relations R in the set $A = \{1, 2, 3, \dots, 13, 14\}$ defined as $R = \{(x, y) : 3x - y = 0\}$
 - (a) Reflexive but not symmetric nor transitive
 - (b) Neither Reflexive nor symmetric nor transitive
 - (c) Reflexive and symmetric but not transitive
 - (d) Equivalence relation
2. Relation R in the set Z of all integers defined as $R = \{(x, y) : x - y \text{ is an integer}\}$
 - (a) Equivalence Relation
 - (b) Reflexive but neither symmetric nor transitive
 - (c) Reflexive and transitive but not symmetric
 - (d) Symmetric but not transitive and reflexive
3. Relation R in the set A of human beings in a town $R = \{(x, y) : x \text{ is the father of } y\}$
 - (a) Transitive but not reflexive nor symmetric
 - (b) Reflexive but not symmetric nor transitive
 - (c) Neither reflexive nor symmetric nor transitive
 - (d) Equivalence Relation
4. Relation R in the set A of human beings in a town $R = \{(x, y) : x \text{ is wife of } y\}$
 - (a) Neither reflexive nor symmetric but transitive
 - (b) Reflexive not symmetric not transitive
 - (c) Equivalence Relation
 - (d) Symmetric but not reflexive not transitive

Part – VI

(Analysis Based Question)

Answer the following question by organizing and integrating the information.

16. Consider $f : R_+ \rightarrow [-9, \infty)$ given by $f(x) = 5x^2 + 6x - 9$. Prove that f is invertible with

$$f^{-1}(y) = \left(\frac{\sqrt{54 + 5y} - 3}{5} \right).$$

Learning Homework: Learn all definitions & formulas from Page No. 1.1 to 1.5 of Elements Book.

Pre-Reading Homework: Read Page no 1.1 to 1.5 of Elements Book and understand their meaning



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Revision Assignment–2

Class: 12th

Ch. Name: Inverse Trigonometric Function

Subject: Maths

Ch. No.: 2

For recapitulation & solving the assignment the students should refer to their NCERT text book of Maths

Part-1

Multiple choice Questions (only one option is correct)

- The equation $2\cos^{-1}x + \sin^{-1}x = \frac{11\pi}{6}$ has
 - No solution
 - Only one solution
 - Two solutions
 - Three solutions
- If $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \pi$, then $x+y+z$ is equal to
 - xyz
 - 0
 - 1
 - $2xyz$
- If $\tan^{-1}\frac{a+x}{a} + \tan^{-1}\frac{a-x}{a} = \frac{\pi}{6}$, then $x^2 =$
 - $2\sqrt{3}a$
 - $\sqrt{3}a$
 - $2\sqrt{3}a^2$
 - None of these
- Find the value of $\cot^{-1}\frac{xy+1}{x-y} + \cot^{-1}\frac{yz+1}{y-z} + \cot^{-1}\frac{zx+1}{z-x} =$
 - 0
 - 1
 - $\cot^{-1}x + \cot^{-1}y + \cot^{-1}z$
 - None of these
- If $\alpha = \tan^{-1}\left(\frac{\sqrt{3}x}{2y-x}\right)$, $\beta = \tan^{-1}\left(\frac{2x-y}{\sqrt{3}y}\right)$, then $\alpha - \beta =$
 - $\frac{\pi}{6}$
 - $\frac{\pi}{3}$
 - $\frac{\pi}{2}$
 - $-\frac{\pi}{3}$

Part – II

(Integer Type Questions)

- Find the positive integral solution of the equation $\tan^{-1}x + \cos^{-1}\frac{y}{\sqrt{1+y^2}} = \sin^{-1}\frac{3}{\sqrt{10}}$
- Find the number of real solution of the equation $\sqrt{1+\cos 2x} = \sqrt{2} \sin^{-1}(\sin x)$, $-\pi \leq x \leq \pi$
- If $\sin^{-1}(x^2 - 7x + 12) = n\pi$, $\forall n \in \mathbb{I}$, then find x .
- If $6\sin^{-1}(x^2 - 6x + 8.5) = \pi$, then find x .

Part – III

(Application Based Questions)

Answer the following questions by applying acquired knowledge, facts, techniques and rules

10. Prove that $\cot^{-1}\left(\frac{1+\cos x}{\sin x}\right) = \frac{x}{2}$.

11. Prove that $\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right) = \frac{\pi}{4} - \frac{1}{2}\cos^{-1}x$.

12. Prove that $\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{2}{11} = \tan^{-1}\frac{3}{4}$.

Part – IV

(Reason and Numerical Based Questions)

13. Evaluate : $\cos\left[\sin^{-1}\frac{1}{4} + \sec^{-1}\frac{4}{3}\right]$.

14. Prove that $\tan\left[\frac{1}{2}\sin^{-1}\frac{2x}{1+x^2} + \frac{1}{2}\cos^{-1}\frac{1-x^2}{1+x^2}\right] = \frac{2x}{1-x^2}$.

Part – V

(Case Study Based Questions)

15. If $f(x) = \tan^{-1}x \left(\frac{2x}{1-x^2}\right)$

Based on the above information, answer the following questions

i. $f(x)$ is equal to

- (a) $\tan^{-1}x$ (b) $2\tan^{-1}x$
(c) $\cot^{-1}x$ (d) $\sin^{-1}\left(\frac{1-x^2}{1+x^2}\right)$

ii. $f(x)$ is equal to

- (a) $\pi/2 + \cot^{-1}x$ (b) $\pi/2 - \cot^{-1}x$
(c) $\pi/2 + \sin^{-1}x$ (d) none of these

iii. Derivative of $f(x)$ is equal to

- (a) $\frac{2}{1+x^2}$ (b) $\frac{1}{1+x^2}$ (c) $\frac{-1}{1+x^2}$ (d) $\frac{-2}{1+x^2}$

iv. $f(x)$ is equal to

- (a) $\cos^{-1}\left(\frac{1+x^2}{1-x^2}\right)$ (b) $\cos^{-1}\left(\frac{1-x^2}{2x}\right)$
(c) $\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$ (d) $\cos^{-1}\left(\frac{1+x^2}{2x}\right)$

Part – VI

(Analysis Based Question)

Answer the following question by organizing and integrating the information.

16. (i) If $\cos^{-1}\frac{x}{a} + \cos^{-1}\frac{y}{b} = \alpha$ prove that $\frac{x^2}{a^2} - 2\frac{xy}{ab}\cos\alpha + \frac{y^2}{b^2} = \sin^2\alpha$.

(ii) $(\tan^{-1}x)^2 + (\cot^{-1}x)^2 = \frac{5\pi^2}{8}$, then find x .



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Revision Assignment-3

Class: 12th

Ch. Name: Matrix and Determinants

Subject: Maths

Ch. No.: 3

For recapitulation & solving the assignment the students should refer to their NCERT text book of Maths

Part-1

Multiple choice Questions (only one option is correct)

1. If $A = \begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$, then $A^2 =$

(a) $\begin{bmatrix} \cos 2\alpha & \sin 2\alpha \\ \sin 2\alpha & \cos 2\alpha \end{bmatrix}$

(b) $\begin{bmatrix} \cos 2\alpha & -\sin 2\alpha \\ \sin 2\alpha & \cos 2\alpha \end{bmatrix}$

(c) $\begin{bmatrix} \cos 2\alpha & \sin 2\alpha \\ -\sin 2\alpha & \cos 2\alpha \end{bmatrix}$

(d) $\begin{bmatrix} -\cos 2\alpha & \sin 2\alpha \\ -\sin 2\alpha & -\cos 2\alpha \end{bmatrix}$

2. If $A = \begin{bmatrix} 1 & 2 & 3 \\ -2 & 3 & -1 \\ 3 & 1 & 2 \end{bmatrix}$ and I is a unit matrix of 3rd order, then $(A^2 + 9I)$ equals

(a) $2A$

(b) $4A$

(c) $6A$

(d) None of these

3. If $A = \begin{bmatrix} 1 & \tan \theta/2 \\ -\tan \theta/2 & 1 \end{bmatrix}$ and $AB = I$, then $B =$

(a) $\cos^2 \frac{\theta}{2} \cdot A$

(b) $\cos^2 \frac{\theta}{2} \cdot A^T$

(c) $\cos^2 \frac{\theta}{2} \cdot I$

(d) None of these

4. Let $A = \begin{bmatrix} 1 & \sin \theta & 1 \\ -\sin \theta & 1 & \sin \theta \\ -1 & -\sin \theta & 1 \end{bmatrix}$, where $0 \leq \theta \leq 2\pi$. Then,

(a) $\text{Det}(A) = 0$

(b) $\text{Det}(A) \in (2, \infty)$

(c) $\text{Det}(A) \in (2, 4)$

(d) $\text{Det}(A) \in [2, 4]$

5. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & 5 \\ 8 & 3 \end{vmatrix}$, then $x =$

(a) 3

(b) ± 3

(c) ± 6

(d) 6

Part - II

(Integer Type Questions)

6. Find the trace of the matrix $A = \begin{bmatrix} 1 & -5 & 7 \\ 0 & 7 & 9 \\ 11 & 8 & 9 \end{bmatrix}$.

7. Find the number of possible matrices of order 3×3 with each entry 2 or 0.

8. Find the value of given determinant $\begin{vmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^5 & 5^6 \end{vmatrix}$

9. Evaluate: $\begin{vmatrix} \log_3 512 & \log_4 3 \\ \log_3 8 & \log_4 9 \end{vmatrix} \times \begin{vmatrix} \log_2 3 & \log_8 3 \\ \log_3 4 & \log_3 4 \end{vmatrix}$

Part – III

(Application Based Questions)

Answer the following questions by applying acquired knowledge, facts, techniques and rules

10. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$, write A^{-1} in terms of A.

11. Let A be a square matrix of order 3 x 3. Write the value of $|2A|$, where $|A|=4$.

12. Find the maximum value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 + \sin \theta & 1 \\ 1 & 1 & 1 + \cos \theta \end{vmatrix}$

Part – IV

(Reason and Numerical Based Questions)

13. If $\begin{bmatrix} xy & 4 \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & \omega \\ 0 & 6 \end{bmatrix}$, find the values of x, y, z and ω .

14. Verify that $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ satisfies the equation $A^3 - 4A^2 + A = O$.

Part – V

(Case Study Based Questions)

15. If $A=[a_{ij}]$ $m \times n$ matrix, then the matrix obtained by interchanging the rows and columns of A is called the Transpose of A.

A square matrix $A=[a_{ij}]$ is said to be symmetric if $A^T=A$ for all possible values of i and j.

A square matrix $A=[a_{ij}]$ is said to be skew symmetric if $A^T = -A$ for all possible values of i and j.

Based on the above information answer the following questions:

(i) Find the transpose of matrix: $\begin{bmatrix} 5 \\ \frac{1}{2} \\ -1 \end{bmatrix}$

(a) $\begin{bmatrix} -1 \\ \frac{1}{2} \\ 5 \end{bmatrix}$

(b) $\begin{bmatrix} -1 \\ \frac{1}{5} \\ 2 \end{bmatrix}$

(c) $\begin{bmatrix} 5 & \frac{1}{2} & -1 \end{bmatrix}$

(d) None of these

(ii) Using transpose properties, $(ABC)^T$ is equal to:

(a) $CTBTA^T$

(b) $ATBTC^T$

(b) (c) $ATCTB^T$

(d) $BTATC^T$

(iii) For any square matrix A with real number entries:

(a) $A+A^T$ is symmetric and $A-A^T$ is a skew-symmetric matrix.

(b) $A+A^T$ is skew-symmetric and $A-A^T$ is a symmetric matrix.

(c) $A+A^T$ is a symmetric as well as a skew-symmetric matrix.

(d) $A-A^T$ is a skew-symmetric as well as a symmetric matrix.

(iv) Any square matrix can be expressed as:

(a) Difference of a symmetric and a skew-symmetric matrix.

(b) Sum of two symmetric matrices.

(c) Sum of a symmetric and a skew-symmetric matrix.

(d) Sum of two skew-symmetric matrices.

Part – VI

(Analysis Based Question)

Answer the following question by organizing and integrating the information.

16. If a, b and c are real numbers and $\Delta = \begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 0$ then show that either $a + b + c = 0$ or $a = b = c$.



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Revision Assignment-4

Class: 12th

Ch. Name: Continuity and differentiability

Subject: Maths

Ch. No.: 4

For recapitulation & solving the assignment the students should refer to their NCERT text book of Maths

Part-1

Multiple choice Questions (only one option is correct)

- Let $f(x) = |x|$ and $g(x) = |x^3|$, then
 - $f(x)$ and $g(x)$ both are continuous at $x = 0$
 - $f(x)$ and $g(x)$ both are differentiable at $x = 0$
 - $f(x)$ is differentiable but $g(x)$ is not differentiable at $x = 0$
 - $f(x)$ and $g(x)$ both are not differentiable at $x = 0$
- The function $f(x) = \sin^{-1}(\cos x)$ is
 - discontinuous at $x = 0$
 - discontinuous at $x = 0$
 - differentiable at $x = 0$
 - none of these
- The set of points where the function $f(x) = x|x|$ is differentiable is
 - $(-\infty, \infty)$
 - $(-\infty, 0) \cup (0, \infty)$
 - $(0, \infty)$
 - $[0, \infty)$
- If $f(x) = \begin{cases} \frac{|x+2|}{\tan^{-1}(x+2)}, & x \neq -2 \\ 2, & x = -2 \end{cases}$, then $f(x)$ is
 - continuous at $x = 2$
 - not continuous at $x = -2$
 - differentiable at $x = -2$
 - continuous but not derivable at $x = -2$
- Let $f(x) = (x+|x|)|x|$. Then, for all x
 - f is continuous
 - f differentiable for some x
 - f' is continuous
 - f'' is continuous

Part - II

(Integer Type Questions)

- Find the value of $f(0)$, so that the given function $f(x) = \frac{(27-2x)^{1/3} - 3}{9-3(243+5x)^{1/5}}$ ($x \neq 0$) is continuous.
- Find the value of $f(0)$ so that the given function $f(x) = \frac{2-(256-7x)^{1/8}}{(5x+32)^{1/5} - 2}$, $x \neq 0$ is continuous everywhere.
- Find the value of k such that the given function $f(x) = \begin{cases} \frac{\sin 3x}{x}, & x \neq 0 \\ \frac{k}{2}, & x = 0 \end{cases}$ is continuous at $x = 0$.
- Find the value of $f(0)$, If the function $f(x) = \frac{2x - \sin^{-1} x}{2x + \tan^{-1} x}$ is continuous at each point of its domain.

Part – III

(Application Based Questions)

Answer the following questions by applying acquired knowledge, facts, techniques and rules

10. Determine the value of 'k' for which the following function is continuous at $x = 3$:

$$f(x) = \begin{cases} \frac{(x+3)^2 - 36}{x-3}, & x \neq 3 \\ k, & x = 3 \end{cases}$$

11. For what value of k is the following function continuous at $x = 2$? $f(x) = \begin{cases} 2x+1; & x < 2 \\ k; & x = 2 \\ 3x-1; & x > 2 \end{cases}$

12. Find the value of c in Rolle's theorem for the function

$$f(x) = x^3 - 3x \text{ in } [-\sqrt{3}, 0].$$

Part – IV

(Reason and Numerical Based Questions)

13. Locate the point of discontinuity (if any) for the functions : $f(x) = \begin{cases} 2x-1 & \text{if } x < 2 \\ \frac{3x}{2} & \text{if } x \geq 2 \end{cases}$

14. The function $f(x) = \begin{cases} \frac{\sin 3x}{x}, & x \neq 0 \\ \frac{k}{2}, & x = 0 \end{cases}$ is continuous at $x = 0$, find the value of k .

Part – V

(Case Study Based Questions)

15. A function is continuous at $x=c$ if the function is defined at $x=c$ and if the value of the function at $x = c$ equals the limit of the function at $x=c$. i.e, $\lim_{x \rightarrow c} f(x) = f(c)$.

If f is not continuous at c , we say f is discontinuous at c , and c is called a point of discontinuity of f . Based on the above information answer the following questions:

i. The number of points of discontinuity of $f(x) = [x]$ in $[3,7]$ is:

- (a) 4 (b) 5 (c) 6 (d) 8

ii. Suppose f and g be two real functions continuous at a real number c then:

- (a) $f + g$ is continuous at $x = c$
(b) $f + g$ is discontinuous at $x = c$
(c) $f + g$ may or may not continuous at $x = c$
(d) None of these

iii. The value of k so that the given function $f(x)$ is continuous at $x=5$.

$$f(x) = \begin{cases} kx + 1; & x \leq 5 \\ 3x - 5; & x \geq 5 \end{cases}$$

- (a) 3/5 (b) 1/5 (c) 4/5 (d) 9/5

$$f(x) = \begin{cases} kx^2; & x \leq 2 \\ 3; & x \geq 2 \end{cases}$$

iv. The value of k so that the given function $f(x)$ is continuous at $x = 2$

- (a) 1 (b) 1/4 (c) 3/4 (d) 11

Part – VI

(Analysis Based Question)

Answer the following question by organizing and integrating the information.

16. Find the value of a and b such that the function $f(x)$ defined by $f(x) = \begin{cases} 5; & \text{if } x \leq 2 \\ ax+b; & \text{if } 2 < x < 10 \\ 21; & \text{if } x \geq 10 \end{cases}$ is a continuous function.



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Revision Assignment-5

Class: 12th

Ch. Name: Differentiation

Subject: Maths

Ch. No.: 5

For recapitulation & solving the assignment the students should refer to their NCERT text book of Maths

Part-1

Multiple choice Questions (only one option is correct)

1. $\frac{d}{dx} \log \tan\left(\frac{\pi}{4} + \frac{x}{2}\right) =$

- (a) cosec x (b) -cosec x (c) sec x (d) -sec x

2. If $x = t^2$, $y = t^3$, then $\frac{dy}{dx} =$

- (a) $3/2$ (b) $3/4t$ (c) $3/2t$ (d) $3t/2$

3. The derivative of $\sec^{-1}\left(\frac{1}{2x^2+1}\right)$ with respect to $\sqrt{1+3x}$ at $x = 1/3$.

- (a) does not exist (b) 0
(c) $1/2$ (d) $1/3$

4. If $\sin(x+y) = \log(x+y)$, then $\frac{dy}{dx} =$

- (a) 2 (b) -2 (c) 1 (d) -1

5. Let $U = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$ and $V = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$, then $\frac{dU}{dV} =$

- (a) $1/2$ (b) x (c) $\frac{1-x^2}{1+x^2}$ (d) 1

Part - II

(Integer Type Questions)

6. Given $y = \sin 2x$, then find dy/dx at $x = 3$

7. If $x^y \cdot y^x = 16$, then find the value of dy/dx at $(2, 2)$

8. If $y = (1+x)(1+x^2)(1+x^4)\dots(1+x^{2^n})$, then find the value of dy/dx at $x = 0$

9. Find the value of c for which the Mean value theorem holds for the function $f(x) = \log_e x$ on the interval $[1, 3]$.

Part - III

(Application Based Questions)

Answer the following questions by applying acquired knowledge, facts, techniques and rules

10. If $x = a\left(\cos t + \log \tan \frac{t}{2}\right)$ and $y = a \sin t$, find the value of $\frac{dy}{dt}$ at $t = \frac{\pi}{4}$.

11. Differentiate $\tan^{-1}\left(\frac{1+\cos x}{\sin x}\right)$ with respect to x .

12. If $x = a(2\theta - \sin\theta)$ and $y = a(1 - \cos 2\theta)$ find $\frac{dy}{dx}$ when $\theta = \frac{\pi}{3}$.

Part - IV

(Reason and Numerical Based Questions)

13. If $y = \cot^{-1}\left(\frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}}\right)$; prove that $\frac{dy}{dx}$ is independent of x .

14. If $y = \log\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)$, prove that $\frac{dy}{dx} = \frac{x-1}{2x(x+1)}$.

Part – V

(Case Study Based Questions)

15. The derivative of f at $x = c$ is defined by: $f'(x) = \lim_{h \rightarrow 0} \frac{f(c+h) - f(c)}{h}$. A function is said to be differentiable at a point c if left hand derivative at $x=c$ is equal to the right hand derivative at $x=c$. Similarly, a function is said to be differentiable in an interval (a,b) , if it is differentiable at every point of (a,b) .

Based on the above information, answer the following questions:

(i) Derivative of $f(x) = \cos(\sqrt{x})$ is:

- | | |
|-----------------------|---------------------------------|
| (a) $-\sin(\sqrt{x})$ | (b) $-\sin(\sqrt{x})/2\sqrt{x}$ |
| (c) $\sin(\sqrt{x})$ | (d) $1/2\sin(\sqrt{x})$ |

(ii) If $y = \sin t, x = \cos t$ then dy/dx is:

- (a) $\cos t$ (b) $-\tan t$ (c) $-\cot t$ (d) $\sin t$

(iii) $f(x) = |x|$ is:

- (a) Differentiable at all points $x \in \mathbb{R}$
(b) Differentiable at all points $x \in \mathbb{R} - \{0\}$
(c) Not Differentiable at $x = 1$
(d) None of these

(iv) Derivative of function $f(x) = \sin(x^2)$ is:

- | | |
|-------------------|-------------------|
| (a) $2\cos(x^2)$ | (b) $2x\cos(x^2)$ |
| (c) $2x^2\sin(x)$ | (d) $2\cos(x)$ |

Part – VI

(Analysis Based Question)

Answer the following question by organizing and integrating the information.

16. (i) If $y = x^{\sin x} + (\sin x)^{\cos x}$, find $\frac{dy}{dx}$.

(ii) $y = x^{\cos x} + (\cos x)^{\sin x}$, find $\frac{dy}{dx}$.



R.E.D. Group of Schools

Summer Holidays Homework (SESSION: 2023-24)

CLASS – 12th

Subject: Computer Science Text Book: Sumita Arora (Computer Sci. with Python)

1. **Syllabus covered up to May end (list the chapters)**

- Chapter No.- 1 Chapter Name- Python Revision Tour
- Chapter No.- 2 Chapter Name- Python Revision Tour-II

2. **List of all new concepts taught upto May end (List the topics)**

- (I) Tokens (Lexical Units) (II) Dynamic typing
- (III) Barebones of a Python program (IV) Mutable and Immutable types
- (V) Type casting (VI) Looping statements- for and while loop
- (VII) String and its functions (VIII) Lists and its functions
- (IX) Tuples and its functions (X) Dictionary and its functions
- (XI) Insertion and Bubble sort

3. **Formative Assessment based Homework:**

- **Section-A-Creative corner - Creating Collage (Any one of the given topics)**
- **Section-B-Thinking Skill based Task (Crossword/ Word Search/ Match ups)**
- **Section-C-Application Skill based Task**
- **Section-D-Learning and Pre-reading homework.**

4. **Summative Assessment based Homework:**

- **Section-E- Chapter-wise Assignments**

5. **Tools required for doing Homework:**

- TextBook (Computer Science with Python by Sumita Arora)
- Notebook
- A4Sheets, Charts, Pictures
- Resources as per activity
- Computer system with Python IDLE

6. **Instruction/Guidelines for Formative Assessment based Homework:**

- **Section-A-Creative corner - Creating Collage (Any one of the given topics)**

Topic: Mutable Data types in Python and their predefined functions.

OR

Immutable data types in Python and their predefined functions.

- **Materials Required:** A4Sheets, Charts, Pictures
 - **Stepstopprepare:**
 - ❖ Take a chart to prepare on topic
 - ❖ Make outline on chart by scale
 - ❖ Collect pictures related to any one of the given topics.
 - ❖ Paste the Pictures on the Chart (Horizontally, Vertically, Diagonally)
- (Note: There should not be black space between pictures)

o **Section-B-Thinking Skill based Task (Crossword/ Word Search/ Match ups)**

Comment

Casting

Data Type

String

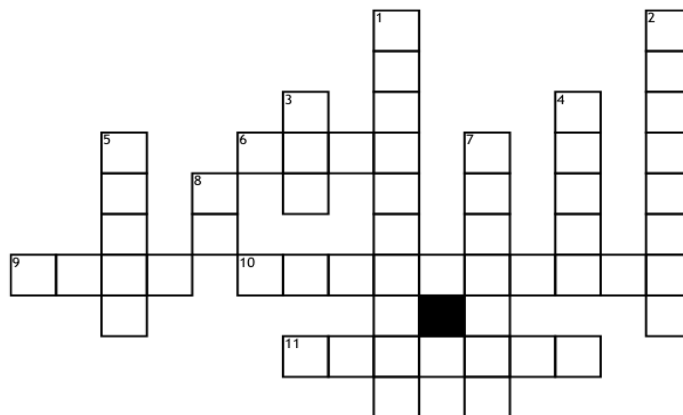
Variable

- Converting one data type to another
- Used to give additional information in the program. This statement is ignored by the compiler.
- Defines the range of possible values and the operations that can be carried out.
- A named memory location that stores a value, this value can be changed while the program is running.
- A sequence of characters

OR

Name: _____ Date: _____

Python



Across

- 6. repeating code
- 9. character for comments
- 10. = is for
- 11. has two values

Down

- 1. >, <, and == are for
- 2. == is for
- 3. executes a set number of times
- 4. keeps executing as long as True
- 5. True or
- 7. statement that repeatedly increments a variable
- 8. if its boolean expression is true, then executes a block of code

o **Section-C-Application Skill based Task**

1. Write a Python script that traverses through an input string and prints its characters in different lines- two characters per line.

2. What is the output of the following?

```
x=12
```

```
for I in x:
```

```
    print(I)
```

3. Write a script in Python that displays digit at one's position digit of the integer.
4. Write a script in Python to check whether an entered string is palindrome or not?
5. What is the output of the following code?

```
i=9
while True:
    if(i+1)%4==0:
        break
print(i,end=' ')
i+=1
```

6. Draw a table showing precedence of different operators we use in Python?
 7. What will be output of the following code?
- ```
tp1=(2,4,3)
tp3=tp1*2
print(tp3)
```
8. Name the function required checking if a string contains only uppercase letters?
  9. Name some of the functions defined in math module(Atleast five)?
  10. Write a program to check whether a number entered is prime or not?

○ **Section-D-Learning and Pre-reading homework.**

- **Learning Homework**

Question & Answers, Keywords (From ChNo.1 Ch. Name-Python Revision Tour ( Pg. No. 29 to 40)

Question & Answers, Keywords (From ChNo.2 Ch. Name-Python Revision Tour-II(Pg. No. 76 to 90)

- **Pre reading Homework**

Ch No. 3Ch. Name- Working with Functions Pg. No. 91-150

7. **Summative Assessment based Homework:**

- **Section-E-Solve the given Revision Assignments.**



# R.E.D. Group of Schools

Revision Assignment -1 (Session: 2023- 24)

Class-12<sup>th</sup> Subject: Computer Sci. Ch. No. & Name: Ch-1 & Python Revision Tour

## PART -A

### Q-1 Multiple Choice Questions:

- i. Which of the following will create a single element tuple?
  - a) (1,)
  - b) (1)
  - c) ([1])
  - d) tuple([1])
- ii. The \_\_\_\_\_ operator tells if an element is present in a sequence or not.
  - a) exists
  - b) in
  - c) into
  - d) inside
- iii. Which value type does input() return?
  - a) Boolean
  - b) String
  - c) Int
  - d) Float
- iv. Negative index -1 belongs to the \_\_\_\_\_ of string.
  - a) First character
  - b) last character
  - c) Second last character
  - d) Second character
- v. How would you write  $x^y$  in Python as an expression?
  - a)  $x^{**}y$
  - b)  $x^y$
  - c)  $x^{^^}y$
  - d) None of these

### Q-2 Fill in the blanks:

- i. A \_\_\_\_\_ is a word having special meaning and role as specified by programming language.
- ii. The \_\_\_\_\_ statement is an empty statement in Python.
- iii. Strings in Python store their individual letters in memory in \_\_\_\_\_ location.
- iv. The explicit conversion of an operand to a specific type is called \_\_\_\_\_.
- v. The \_\_\_\_\_ statement skips the rest of the loop and jumps over to the statement following the loop.

**Q-3 Very Short Answer Types Questions:**

- i. Is the following statement valid? Why?  

```
>>> "a"==a
```
- ii. What is None literal in Python?
- iii. If the == operator returns True for an expression a == b, does it indicate that both variables a and b refer to the same memory location?
- iv. What are the two ways to add something to a list? How they are different?
- v. What is entry controlled loop? Which loop is entry controlled loop in Python?

**PART -B**

**Q-4 Short Answer Types Questions:**

- i. An Immutable data type is one that cannot change after being created. Give three reasons to use immutable data
- ii. Explain the use of pass statement. Illustrate it with an example.
- iii. Predict the output of the following code:-

```
Numbers=[9,18,27,36]
```

```
for num in Numbers:
```

```
 for N in range(1,num%8):
```

```
 print(N,"#",end=" ")
```

```
 print()
```

- iv. Explain concept of random() and randint() function with suitable example?
- v. Write program in Python to check whether a number entered is prime or not?

**PART -C**

**Q-5 Case Study Based/ Long Answer Type Questions:**

Write a Python code to allow the user to enter a two digit number and generate a six digit random number and check whether the entered number and number generated by system are same or not, if yes then display "you are winner" on screen otherwise display "better luck next time" on screen.



# R.E.D. Group of Schools

## Revision Assignment -2 (Session: 2023- 24)

Class- 12<sup>th</sup> Subject: Computer Sci. Ch. No. & Name: Ch-2 & Python Revision Tour-II

### PART -A

#### Q-1 Multiple Choice Questions:

- i. The numbered position of a letter in a string is called \_\_\_\_
  - a) Position
  - b) Integer Position
  - c) index
  - d) Location
- ii. The keys of a dictionary must be of \_\_\_\_ types.
  - a) Integer
  - b) Mutable
  - c) Immutable
  - d) Any of these
- iii. Which of the following functions will return a list containing all words of a string?
  - a) find()
  - b) index()
  - c) partition()
  - d)split()
- iv. What is the output when we execute list("hello")?
  - a) ['h','e','l','l','o']
  - b) ['hello']
  - c) ['llo']
  - d)['olleh']
- v. Which of the below given functions cannot be used with nested tuples?
  - a) index()
  - b) count()
  - c) max()
  - d) sum()

#### Q-2 Fill in the blanks:

- i. The \_\_\_\_ function returns all the key: value pairs as (key, value) sequences.
- ii. Creating a tuple from a set of values is called \_\_\_\_\_.
- iii. Dictionaries are \_\_\_\_\_ set of elements.
- iv. \_\_\_\_\_ Value is assigned to keys, if no value is specified with from keys() method.
- v. A copy of the dictionary where only the copy of the keys is created for the new dictionary , is called \_\_\_\_\_ copy.

#### Q-3 Very Short Answer Types Questions:

- i. Can non graphic characters be used and processed in Python? How? Give answer to support your answer.
- ii. Explain concept of bubble sort with example?
- iii. What type of objects can be used as keys in dictionaries?
- iv. How is del D and del D[<key>] different from one another if D is a dictionary?
- v. Can we use a dictionary within another dictionary? If Yes then how, if no then why.

### PART -B

#### Q-4 Short Answer Types Questions:

- i. Write a short Python code segment that adds up the lengths of all the words in a list and then prints the average (mean) length.
- ii. Write a program to sort a dictionary's keys using bubble sort and produce the sorted keys as a list.
- iii. Write a program in Python to display Fibonacci series upto 10 elements.
- iv. Write short note on user defined and pre-defined functions.
- v. Write a program to check whether entered string is palindrome or not.

### PART -C

#### Q-5 Case Study Based/ Long Answer Type Questions:

Write a program in Python that rotates the elements of a list so that the element at the first index moves to the second index, the element at the second index moves to the third index, etc., and the element in the last index moves to the first index.