Sanskriti KMV SCHOOL

Session 2026-27

Summer Break Assignments

Grade-XI Science

Summertime offers the perfect pause to rejuvenate the body, mind, and spirit."

Dear Parents,

The summer vacation is a cherished opportunity to pause, reconnect with loved ones, and invest time in meaningful and enjoyable pursuits. To make this interval both enriching and engaging, we have curated a collection of experiential learning tasks aimed at promoting creativity, responsibility, and joyful exploration.

As the students unwind and recharge, we request your support in ensuring that this break is spent in a productive and wholesome manner. A few essential guidelines are as follows:

- **All assignments must be completed with sincerity and submitted promptly afterthe vacation. Kindly ensure the work is neatly arranged in a well-labelled folderwith the student's name, father's name, class, and section.**
- **Promote daily physical activity by encouraging your child to follow a simple fitnessroutine and adopt healthy eating habits.**
- **Engage your child in basic household tasks to instil a sense of cooperation andindependence.**
- **Limit screen time and create opportunities for heartfelt conversations andbonding, especially with grandparents.**
- **Maintain a creative journal capturing memorable outings, celebrations, or simplejoyful moments, accompanied by photographs.**
- **Let us work together to make this summer a season of discovery, joy, andmeaningful learning.**

"Wishing you a refreshing, safe, and sunshine-filled holiday season!"

HAPPY HOLIDAYS

ENGLISH

1. **POSTER MAKING**
   - Design any one creative poster on the following topics related to Punjab and Odisha (Orissa):
   - Festivals of Punjab and Odisha
   - Traditional Dress of Punjab and Odisha
   - Famous Food of Punjab and Odisha
   - Tourism in Punjab and Odisha
   - Dance Forms of Punjab and Odisha
   - Use catchy slogans and creative illustrations.

2. **ADVERTISEMENT WRITING**

   Design attractive and well-formatted classified advertisements for the following situations:

   (a) **Situation Vacant**

   You are the Principal of a reputed senior secondary school in Jalandhar. Draft a classified advertisement for a leading newspaper announcing the requirement of a qualified and experienced English Teacher. Mention the required qualifications, communication skills, experience, salary benefits, and contact details.

   (b) **For Sale**

   You wish to sell your fully furnished house located in a prime residential area. Draft a classified advertisement mentioning the location, number of rooms, modern facilities, nearby amenities, expected price, and contact details.

3. **BOOK READING AND REVIEW**

   Read any one novel/book of your choice and prepare a detailed review including the following points:
   - Title and Author
   - Theme and Plot Summary
   - Favourite Character
   - Important Message/Learning
   - Your Personal Opinion

- Favourite Quote from the Book

4. **CREATIVE & INNOVATIVE TASK**

   'Digital Detox Challenge'

   Spend one hour daily away from gadgets for at least 10 days.

   Record your experience in a journal under the title:

   - ❖ 'Life Beyond Screens'
   - ❖ Mention:
     - Activities performed
     - Feelings and observations
     - Positive changes experienced

5. **PROJECT FILE**

   - ❖ **Guidelines**
     - It is compulsory for all students to prepare the Project File for Internal Assessment.
     - The assessment will include:
       - ✓ Project File – 5 Marks
       - ✓ Viva – 5 Marks
       - ✓ The project should be handwritten in about 800–1000 words.
       - ✓ Use A4 size white sheets and get the file spiral bound.
       - ✓ Cover Page, Acknowledgement and Certificate may be printed, but the remaining work should be handwritten neatly.
       - ✓ Paste pictures, charts and graphs on the left side and write the content on the right side.
       - ✓ Students should collect information through surveys, interviews, questionnaires, articles and case studies.
       - ✓ At least 10 people should be interviewed and a questionnaire of 15 questions should be prepared.
       - ✓ Attach photographs, questionnaire and other

evidences at the end of the file.

Suggested Topics for Grade XI

- Importance of Time Management in Student Life
- Linguistic Chauvinism and Importance of Mother Tongue
- Fear, Phobias and Ways to Overcome Them
- Stress, Anxiety and Mental Health among Students
- Environmental Degradation and Conservation
- Meditation and Importance of Self-Introspection
- Importance of Parents and Care for Elders
- Condition of Old Age Homes in India
- Freedom Movements of India and Contributions of Freedom Fighters
- Importance of Nature and Mental Peace
- Disability and Inclusion in Society
- Society's Attitude Towards Disabled People
- Life in Slums and Child Labour
- Education for Underprivileged Children
- Role of Youth in Upliftment of Society
- War, Peace and Their Impact on Society
- Crime and Criminal Behaviour in Society
- Condition of Farmers in India
- Or Any Contemporary Topic

Project File Layout

- Cover Page
- Objective / Purpose
- Certificate
- Action Plan
- Introduction
- Main Content (Survey, Interview, Questionnaire, Case Study, Articles, Graphs, Pictures)
- Handwritten Report / Essay (800–1000 words)
- Student Reflection (100–150 words)

- Photographs / Evidence
- Bibliography / Resources

Parameters of Assessment

- Quality of Content
- Accuracy of Information
- Creativity and Presentation
- Grammar and Spellings
- Clarity of Ideas
- Timely Submission
- Participation and Effort
- Knowledge and Understanding

HAPPY LEARNING & HAPPY HOLIDAYS!

PHYSICS

[A] Complete the following Assignment on loose sheets:

1. What is the essential requirement for the choice of standard unit? Who decides the units?
2. Define astronomical unit, light year and par-second. Establish relation between them.
3. Explain the need for the measurement in physics and briefly explain the measuring process of any physical quantity.
4. What do you know about S.I? Define the fundamental and supplementary units on S.I?
5. The density of the wood is 0.5 g/cc. what is its value in SI system?
6. How much longer a parsec from a light year?

7. A body travels a distance of 2m in 2 seconds and 2.2 m in next 4 seconds. What will be the velocity of the body at the end of 7^{th} seconds.

8. Discuss the silent feature of gravitational, electromagnetic and nuclear force.

9. Mention a few examples of physics in relation to other sciences.

10. State three important conservation laws used in classical physics.

11. The mass of proton is 1.67×10^{-27} kg. How many protons would make 1 gram?

12. Calculate the number of light years in one kilometre.

13. Derive the SI unit of work or energy in terms of fundamental units.

14. By the method of dimensions, obtain an expression for the surface tension S of a liquid rising in a capillary tube. Assume that S depends on mass *m* of liquid, Pressure *p* of liquid and radius *r* of the capillary tube. Take k = ½.

15. The period of vibration of a tuning fork depends on the length *l* of its prong, density *ρ* and Young's modulus 'Y' of its material. Determine an expression for period of vibration using the method of dimensions.

16. Explain the uses of dimensional equations giving at least one example in each case.

17. Define uniform velocity of an object moving along a straight line. What will be the shape of position -time and velocity- time graph.

18. Draw velocity –time graph of a uniformly accelerated motion in one dimension and explain that the distance travelled is equal to the area under velocity –time graph.

19. Explain dot and cross product of two vectors. Give its examples and properties.

20. What is the advantage in choosing the wave length of the light radiation as a standard of length?

[B] Complete the Lab manual as instructed in class.(Evergreen Publication)

1. To measure diameter of a small spherical/cylindrical body using Vernier Callipers.

2. To measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.

3. To measure diameter of a given wire by using screw gauge.

4. To measure the thickness of the given sheets by using screw gauge.

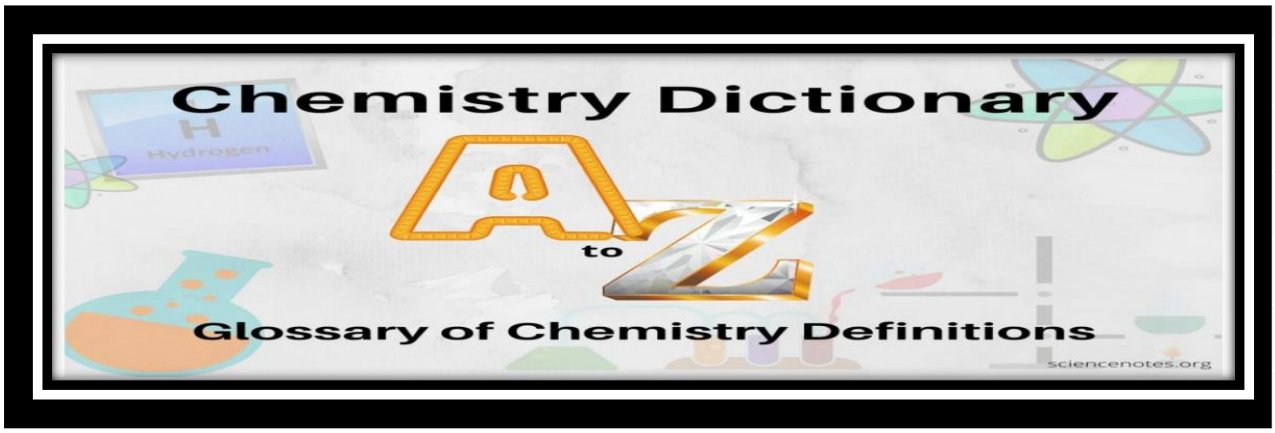
5. To determine volume of an irregular lamina using screw gauge.

6. To determine radius of curvature of a given spherical surface by using spherometer.

7. Using a simple pendulum, Plot its L-T^2 graph and use it to find the effective length of second's pendulum.

8. To study the variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

CHEMISTRY



1. To inculcate scientific temperament and for understanding the conceptual knowledge of chemistry, students have to prepare a GLOSSARY OF CHEMISTRY. Add relevant pictures, diagrams and related to these discoveries.

Use A-4 size sheets and write in neat handwriting. Glossary must comprise of 10 Chemistry terms (with their definitions) of each alphabet including Laws, formulas, principles and microscale chemistry apparatus.

CHAPTER – 1 : SOME BASIC CONCEPTS OF CHEMISTRY

1. How many moles of NaOH are contained in 27 ml of 0.15 M?

2. Calculate the number of atoms in each of the following:
a - 52 moles of He b - 52 u of He combines with bromine to form KBr.

3. Calculate the molarity of of 1 L of solution of ethanol in water in which the mole fraction of ethanol is 0.040.

4. If ten volumes of dihydrogen gas reacts with five volumes of dioxygen gas, how many volumes of water vapour could be produced?

5. Calculate the molarity of NaOH in the solution prepared by dissolving its 4gms in enough water to form 250mL of the solution.

6. The density of 2 molal solution of NaOH is 1.10 g per ml. Calculate the molarity of the solution.

7. How many atoms and molecules of phosphorous are present in 124gms of phosphorous (P4)?
8. A 6.9M solution of KOH in water contains 20% by weight of KOH. Calculate the density of solution.

9. Calculate the molality and molarity of 1 L solution of 93% H2SO4(Wt. /Vol). The density of solution is 1.84g/ml.

10. Chlorophyll the green coloring matter of plants responsible for photosynthesis contains 2.68% of magnesium by weight. Calculate the number of magnesium atoms in 2.0 g of chlorophyll.

11. Calculate molality, Molarity and mole fraction of KI if the density of 20% aquoeus KI solution is 1.202 g/ml.
12. What volume of O2 at N.T.P is needed to cause the complete combustion of 200 ml of acetylene? Also calculate the volume of CO2 formed.

13. Butyric acid contains only C, H and O. A 4.24 mg sample of butyric acid is completely burned. It gives 8.45mg of CO_2 and 3.46 mg of H_2O.The molecular mass of butyric acid was determined by experiment to be 88amu.What is its molecular formula?

14. The density of water at room temperature is 1.0 g/ml. How many molecules are there in a drop of water if its volume is 0.05 ml?

15. Potassium Bromide contains 32.9% by mass of potassium. If 6.40 gm of bromine reacts with 3.60 gm of Potassium. Calculate the no. of moles of potassium which combines with bromine to form KBr

CHAPTER – 2 : STRUCTURE OF ATOM

1. How can you show using Pauli's exclusion principle that p sub shell can have only 6 electrons?

2.What are the values of 'n' and 'l' for 6g?

3. How many number of unpaired electrons are present in Fe^{2+} (Z=26)?

4. What is the ratio of the energy of a photon of λ = 100pm to that of one of λ = 200pm?

5. How many radial nodes are present in 2p and 3s orbital?

6. Out of Fe^{2+}, Fe^{3+}, which is more stable and why?

7. Calculate the uncertainity in the position of an electron if uncertainity in its velocity is 0.001%. The mass of electron = 9.11 X 10-31 kg and velocity of electron = 300m/s.

8. Account for the following. a. The expected electronic configuration of copper is [Ar] 3d9 4s2 but actually it is [Ar] 3d10 4s1 b. In building up of atoms the filling of 4s orbitals occur before 3d orbitals c. Spin quantum number can have only 2 values +1/2 and -1/2

9. Write short note on the following a. Aufbau principle. b. Heisenberg's uncertainty principle. c. Hund's rule. d. Photo electric effect. e. Black body radiation.

10. Derive a relationship between the wavelength associated with a moving particle and its kinetic energy.

11. Write down electronic configuration of Fe3+ ion and answer the following questions a. What is the number of unpaired electrons in it? b. How many electrons in it have n = 3 and m = 0? c. How many electrons in it have l = 1? d. What is the number of electron in M-shell?

12. A bulb emits light of wavelength 4500 A0. The bulb is rated as 150 watt and 8% of the energy is emitted as light. How many photons are emitted by the bulb per second?

13. Identify and arrange the orbitals represented by the following in decreasing order of energy a. n = 4, l = 0 b. n = 3, l = 1 c. n = 3, l = 2 d. n = 3, l = 0

14. When a certain metal was irradiated with light of frequency 4.5 x 1016 s-1 , the photo electrons emitted had 3 times the kinetic energy as the kinetic energy of photo electrons emitted when same metal was irradiated with light of frequency 2.5 x 1016 s-1 . Calculate threshold frequency of the metal.

15. Light of wavelength 400 nm strikes a certain metal which has a photoelectric work function of 2.13 eV. Find out the maximum Kinetic energy of the photoelectrons.
(1eV = 1.6 X 10-19J)

BIOLOGY

NOTE- SOLVE THE GIVEN ASSIGNMENT IN SHEETS

LESSON – THE LIVING WORLD & BIOLOGICAL CLASSIFICATION

1What is Binomial system of nomenclature ? Who proposed this system?

2 How is the five kingdom classification advantageous over two kingdom classification?

3 What is the principle underlying the use of cyanobacteria in agricultural fields for crop improvement?

4 Write the correct order of sequence of taxonomical categories and define species, order and kingdom.

5 What are conidia ? How they are different from aplanospores?

6 Compare the fruiting bodies found in fungi.

7 Fungi are cosmopolitan in nature, write the role of fungi in daily life.

8 Discuss the modes of reproduction in the fungi.

LESSON – PLANT KINGDOM

1 Explain why gymnosperms fail to produce fruits.

2 Food is stored as floridean starch in Rhodophyceae. Mannitol is the reserve food material of which group of algae.

3 Why is the plant body of an algae called thallus? Name any two unicellular green algae which are placed in the plant kingdom instead of the kingdom – Protista.

4 Which organism remains associated with coralloid roots of Cycas? What is the nature of association and what function does the organism perform inside the Cycas roots?

5 Draw labelled diagrams of

(a) Female and male thallus of liverwort

(b) Gametophytes and sporophyte of funaria

6 Based on your understanding of the chapter answer the following.

(a) Algae are used for obtaining agar.

(b) How would you explain the term Sargasso sea

(c) Why is Sphagnum used as packing material for trans-shipment of living material.

7 Differentiate between Red , Brown & Green algae?

PROJECT- You can upcycle old jars, bowls or purchase specialized glassware to create a terrarium

LESSON – ANIMAL KINGDOM

1 Differentiate

(a) chordates and non-chordates

(b) chondriochthyes and osteiochthyes

(c) phylum platyhelminthes and nematehelminthes

2 Explain the terms of phylum porifera – water canal system , coenocytes and skeleton.

3 Write features of phylum mollusca.

4Which is the most distinctive feature of Echinodermata? Explain

5 List the features of class Amphibia, Aves ,Mammals and Reptilia.

6 Make a comparative study on excretory system and mode of nutrition in non chordates.

Project – ROLL NO.- 1 TO 25 – Make a project file on Non – Chordates

ROLL NO – 26 TO 49 – Make a project file on Chordates

NOTE -PRACTICAL FILE

Complete your practical file. All the experiments are to be written in neat hand writing with neat and labelled diagram.

Experiments

SECTION -A

1 Preparation and study of T S of dicot and monocot roots and stem.

2 Study of osmosis by potato osmometer.

3 Study of plasmolysis in epidermal peels

4 Study of distribution of stomata on the upper and lower surface of leaves.

5 Comparative study of the rates of transpiration in the upper and lower surface of leaves.

6 Test the presence of sugar , proteins, fats and carbohydrates in plant tissues.

7 Separation of plant pigments through paper chromatography.

8 Study the rate of respiration in germinating seeds.

SECTION -B

1 Parts of compound microscope

2 Write identifying features of specimens(PLANT KINGDOM)

3Write the identifying features of specimens (ANIMAL KINGDOM)

4 Mitosis in onion root tip cells

5 Different types of inflorescence

6 Human skeleton and different types of joints.

Revise the syllabus for unit test.

PSYCHOLOGY

TASK 1

Practical file:

- Introduction to Psychological testing
- Goals of Scientific Enquiry
- Steps in Conducting Scientific Research
- Methods of Enquiry in Psychology
  - Observation method
  - Experimental method
  - Case study
  - Psychological tests
  - Interview method
  - Correlational Research

- Make it on loose sheets which is one side plane and the other side ruled. It should be black and white no coloured sheets will be accepted.
- Use black pen for heading and blue pen for rest of the file
- PDF for the same will be provided.

TASK 2

Activity: Conduct a Simple Survey

Create a short survey on a topic of interest (e.g., study habits, stress levels). Administer it to at least 15 people and analyse the results.

Submit the analysis of your survey along with the questionnaire.

TASK 3

Objective: The objective of this project is to help students recognize and apply psychological concepts in their daily lives, fostering a deeper understanding of the subject.

Instructions:

1. **Daily Journal**: Each student will maintain a daily journal throughout the holiday period. In this journal, they will record observations and experiences related to psychological phenomena they encounter in their everyday lives. Encourage them to be mindful of various aspects of human behaviour, cognition, and emotions.

2. **Weekly Reflections**: At the end of each week, students will write a reflection on their journal entries. They should analyse and interpret the observed phenomena using relevant psychological theories and concepts learned in class or through additional research.

3. **Application Projects**: In addition to journaling, students will choose one real-life situation or context (e.g., family dynamics, peer interactions, social media influence, decision-making, stress management) and apply psychological principles to analyse and propose solutions or strategies. They should demonstrate how psychological knowledge can be used to understand and address issues in their chosen context.

4. **Creative Expression:** Students will have the option to express their reflections and application projects creatively. They can choose from various formats such as:

    - Artwork (paintings, drawings, collages)
    - Creative Writing (poems, short stories, narratives)
    - Multimedia Presentations (videos, animations, digital storytelling)
    - Photography Projects
    - Role-plays or Skits

5. **Peer Sharing**: Towards the end of the holiday period, students will have the opportunity to share their journal entries, reflections, and application projects with their peers in a structured discussion or presentation session. This will allow them to learn from each other's experiences and perspective:

***Submission**: Journal entries, weekly reflections, and application projects should be compiled and submitted to the teacher.*

COMPUTER SCIENCE

1. Solve the following :
    i. $(48)_{10}$ to $(?)_2$, $(?)_8$, $(?)_{16}$
    ii. (CAFE) to $(?)_8$
    iii. $(347)_8$ to $(?)_2$,$(?)_{16}$
    iv. (BEAD.23) to$(?)_8$
2. Complete the following table

MEMORY UNIT	STORAGE CAPACITY
1 BYTE	
1 TB	
	1024 GB
	1024 TB
1 KB	
	0/1
1GB	

3. Write the storage capacity of following devices:

Disk/Drive Name	STORAGE CAPACITY
1. CD 2. DVD 3. BLU - RAY 4. HARD-DISK 5. MEMORY STICK 6. FLOPPY-DISK	

4. Draw logic circuit for the following:
   i. Y= AB+BC(B+C)
   ii. $z = ab + \bar{b}c + \bar{c}\,\bar{a}$
5. **Verify De Morgan's Laws** using truth tables.

$$A \bar{+} B = \bar{A} \cdot \bar{B}$$
$$A\bar{B} = \bar{A} + \bar{B}$$

6. **REAL LIFE TECH EXPLORER**
   Investigate Your Own Computer/Mobile
   Find and write:

Component	**Details**
Processor Name	_____
RAM Size	_____
Storage Capacity	_____
Operating System	_____

Note: Do this work in fair notebook.

AIL: Create a QUIZ PPT on Punjab & Orissa. (Minimum 10 questions with answer slides and use proper graphics and animation.)

Note: submit your PPT at skmvai3@gmail.com with your name & Class

PHYSICAL EDUCATION

Write Down 10 to 15 Pages Project on Asian Games 2026 Comprising

1.History

2.Event

3.Venue

4.Indian Players

MUSIC

Make a Practical file

Topics have to be written

Notation of Drut khyaal of

Raga Bhimplasi

Raga Bhairavi

Notation of

Teentala

Ektala

Chartala

With it's Ekgun, Dugun and Chaugun

DANCE

Assignment

Prepare the following topics :-

1.Gharanas of Kathak

2. Teen taal and Keharwa taal (Single& Double)

3. Taal and Laya

4. Short Definations

5. Classical Dances of India

FINE ARTS

Make two landscape paintings (nature scene, city scene, railway station, or bus stand) on a canvas board and a half sheet.

Still life - any 2 (size -Half sheet or Canvas)

Composition - any 2 (Half sheet)

🌿 Eco Club Summer Green Mission 🌿

Theme for the Session

"Small Green Steps, Big Future Changes"

Eco Club Slogan

"Save Nature Today, Secure Tomorrow."

Event Name

🌿 "My Kitchen Garden Mission" 🌿

Activity Details

Students will create a small kitchen garden at home using any one of the following:

- Pots
- Recycled bottles

- Trays
- Balcony space
- Terrace area
- Backyard soil

Students may select and grow:

- Coriander
- Mint
- Spinach
- Tomatoes
- Chillies
- Fenugreek
- Basil
- Any other seasonal vegetables/herbs

Student Tasks

Students Will Submit an Observation Report on an A4 Sheet:

📸 Paste 1–2 photographs while planting.

📝 Write about:

- Weekly growth record
- Plant grown
- Duration taken for growth
- Challenges faced during gardening

Trigonometric Functions

1. If $\sin\theta = \frac{3}{5}, \tan\varphi = \frac{1}{2}, \frac{\pi}{2} < \theta < \pi < \varphi < \frac{3\pi}{2}$ then find the value of $8\tan\theta - \sqrt{5}\sec\varphi$.

   $\left(A = \frac{-7}{2}\right)$

2. If $\sin A = \frac{3}{5}, 0 < A < \frac{\pi}{2}, \cos B = \frac{-12}{13}, \pi < B < \frac{3\pi}{2}$, find the value of

   $\sin(A-B), \cos(A+B), \tan(A-B)$

3. If A lies in the fourth quadrant and $\cos A = \frac{5}{13}$, find the value of $\frac{13\sin A + 5\sec A}{5\tan A + 6\cos ecA}$

4. If $\cos\theta = \frac{-1}{2}$ and $\pi < \theta < \frac{3\pi}{2}$, find the value of $4\tan^2\theta - 3\cos^2\theta$

5. If $\sin A = \frac{3}{5}, 0 < A < \frac{\pi}{2}$ and $\cos B = \frac{-12}{13}, \pi < B < \frac{3\pi}{2}$ then find the following:

   (i) $\sin(A-B)$ (ii) $\cos(A+B)$ (iii) $\tan(A-B)\left(A = \frac{-16}{65}, \frac{-33}{65}, \frac{16}{63}\right)$

6. Find the value of $\tan(A+B)$, given that $\cot A = \frac{1}{2}, \sec B = \frac{-5}{3}, \pi < A < \frac{3\pi}{2}, \frac{\pi}{2} < B < \pi$

7. Prove the following:

   a) $\cos 570^\circ \sin 510^\circ + \sin(-330^\circ)\cos(-390^\circ) = 0$

   b) $\frac{\cos(2\pi+\theta)\cos ec(2\pi+\theta)\tan\left(\frac{\pi}{2}+\theta\right)}{\sec\left(\frac{\pi}{2}+\theta\right)\cos(\theta)\cot(\pi+\theta)} = 1$

   c) $\frac{\cos(90^\circ+\theta)\sec(-\theta)\tan(180^\circ-\theta)}{\sec(360^\circ-\theta)\sin(180^\circ+\theta)\cot(90^\circ-\theta)} = -1$

   d) $\sin^2\frac{\pi}{4} + \sin^2\frac{3\pi}{4} + \sin^2\frac{5\pi}{4} + \sin^2\frac{7\pi}{4} = 2$

   e) $\sin 600^\circ \tan(-690^\circ) + \sec 840^\circ \cot(-945^\circ) = \frac{3}{2}$

   f) $\cos 306^\circ + \cos 234^\circ + \cos 162^\circ + \cos 18^\circ = 0$

   g) $\sin^2 54^\circ - \sin^2 72^\circ = \sin^2 18^\circ - \sin^2 36^\circ$

8. In any quadrilateral ABCD, prove that: $\sin(A+B) + \sin(C+D) = 0$

9. Prove that:

   a) $\tan 315^\circ \cot(-405^\circ) + \cot 495^\circ \tan(-585^\circ) = 2$

   b) $\cos 510^\circ \cos 330^\circ + \sin 390^\circ \cos 120^\circ = -1$

   c) $\sin\frac{8\pi}{3}\cos\frac{23\pi}{6} + \cos\frac{13\pi}{3}\sin\frac{35\pi}{6} = \frac{1}{2}$

   d) $\cos 570^\circ \sin 510^\circ + \sin(-330^\circ)\cos(-390^\circ) = 0$

e) $3\sin\frac{\pi}{6}\sec\frac{\pi}{3}-4\sin\frac{5\pi}{6}\cot\frac{\pi}{4}=1$

f) $\dfrac{\cos(2\pi+\theta)\operatorname{cosec}(4\pi+\theta)\tan\left(\frac{\pi}{2}+\theta\right)}{\sec\left(\frac{\pi}{2}+\theta\right)\cos(-\theta)\cot(\pi+\theta)}=1$

10. In any cyclic quadrilateral ABCD, prove:
    a) $\tan A+\tan B+\tan C+\tan D=0$
    b) $\cos(180°-A)+\cos(180°+B)+\cos(180°+C)-\sin(90°+D)=0$
11. Find x from the following equation: $\operatorname{cosec}(90°+\theta)+x\cos\theta\cot(90°+\theta)=\sin(90°+\theta)$
12. If A,B,C,D are angles of a cyclic quadrilateral, prove that:
    $\cos A+\cos B+\cos C+\cos D=0$
13. Find x from the following equation:
    a) $\operatorname{cosec}(270°+A)=\cos(180°+A)+x\sin(90°+A)\cot(270°+A)$
    b) $x\cot(90°+A)+\tan(90°+A)\sin A+\operatorname{cosec}(90°+A)=0$
14. Prove that:
    a) $\tan 8\theta-\tan 6\theta-\tan 2\theta=\tan 8\theta\tan 6\theta\tan 2\theta$
    b) $\tan 70°=\tan 20°+2\tan 50°$
    c) $\dfrac{\cos 11°+\sin 11°}{\cos 11°-\sin 11°}=\tan 56°$
    d) $\dfrac{\cos 15°-\sin 15°}{\cos 15°+\sin 15°}=\dfrac{1}{\sqrt{3}}$
15. If $A+B=\frac{\pi}{4}$, prove that $(1+\tan A)(1+\tan B)=2$
16. Evaluate: a) $\cos(-1125°)$ b) $\tan\left(\frac{11\pi}{6}\right)$ c) $\operatorname{cosec}(-1200°)$
17. Prove that:
    a) $\dfrac{\sin(A+B)+\sin(A-B)}{\cos(A+B)+\cos(A-B)}=\tan A$
    b) $\dfrac{\sin(A-B)}{\cos A\cos B}+\dfrac{\sin(B-C)}{\cos B\cos C}+\dfrac{\sin(C-A)}{\cos C\cos A}=0$
    c) $\tan 13\theta-\tan 9\theta-\tan 4\theta=\tan 13\theta\tan 9\theta\tan 4\theta$
    d) $\tan 15°+\tan 30°+\tan 15°\tan 30°=1$
    e) $\tan 36°+\tan 9°+\tan 36°\tan 9°=1$
    f) $\dfrac{\cos 8°-\sin 8°}{\cos 8°+\sin 8°}=\tan 37°$
    g) $\dfrac{\cos 9°+\sin 9°}{\cos 9°-\sin 9°}=\tan 54°$
    h) $\tan 50°=\tan 40°+2\tan 10°$
    i) $\tan\left(\frac{\pi}{4}+A\right)\tan\left(\frac{\pi}{4}-A\right)=1$

Complex Numbers and Quadratic Equations

Q. No. 1 - 5 are very short answer type questions:

1. Find the value of x and y $(x, y \in R)$ if : $2y+(3x-y)i=5-2i$
2. Express $3i^3+6i^{16}-7i^{29}+4i^{27}$ in the form $x+iy$ where $x, y \in R$.
3. Evaluate : $\left(i^{41}+\frac{1}{i^{257}}\right)^9$
4. If $Z_1=1-i, Z_2=-2+4i$, find $\text{Im}\left(\frac{Z_1 Z_2}{\overline{Z_1}}\right)$.
5. Find the conjugate of the complex number: $\frac{1}{2-3i}$
6. Write the following complex numbers in the polar form:
   (i) $-2-2i$ (ii) $\frac{1}{1+i}$
7. Find the complex conjugate of $\frac{(8-3i)(6-i)}{2-2i}$.
8. Find the multiplicative inverse of $\left(\frac{3+4i}{4-5i}\right)$
9. Find the modulus and argument of $\frac{1+2i}{1-3i}$
10. If $(a+ib)^2=(x+iy)$, prove that $\left(a^2+b^2\right)^2=\left(x^2+y^2\right)$
11. Find x and y if $\frac{(1+i)x-2i}{3+i}+\frac{(2-3i)y+i}{3-i}=i$
12. For what values of x and y are the numbers $-3+ix^2y$ and x^2+y+4i complex conjugates? (x, y are real numbers.)
13. Solve the following quadratic equations:

(i) $6x^2-17ix-12=0$

(ii) $3x^2+7ix+6=0$

$(iii)\ x^2-(7-i)x+18-i=0$

$(iv)\ x^2-\left(3\sqrt{2}-2i\right)x-6\sqrt{2}i=0$

$(v)\ 2x^2-(3+7ix)x+9i-3=0$