

**DAV CENTENARY PUBLIC SCHOOL**  
**HOLIDAY HOMEWORK**  
**CLASS – XI**

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**ECONOMICS**

- Do exercise Ch - 1 to 6.
- 20 numerical of Mean (Direct, Shortcut & Step Deviation Method).
- 20 numerical of Median.
- 20 numerical of Mode.
- Make a chart showing Histogram, Ogive and Pie chart.

**GEOGRAPHY**

**1. Recall and Revise**

Learn Ch.1,2,3 & (fundamentals of physical geography)

Learn chapter-1 and 2 (Unit-1 : Ch-1 Geography as a Discipline)

Ch-2 : The Earth . The origin and evolution of the Earth, Ch-3: Interior of the Earth

INDIA: PHYSICAL ENVIRONMENT UNIT-1 Ch-1 INDIA- LOCATION

**2. Explore and Elaborate**

Read all sources of Ch1,2,3. Also frame at least three questions/answers from each source.

**3. Analyse and Answer**

Do the given assignment of Ch.1,2,3 in a fair notebook.

**4. Locate and Label**

On an outline map of India mark the sites mentioned in Map List. (prescribed by CBSE)

**INDIA- LOCATION**

1. Latitudinal Extent of India, longitudinal, Standard meridian of India, Important latitude passing through India (Tropic of cancer)

Southern most point of mainland of India (Kanyakumari) Locating and labelling on outline political world map

- political map of all continents of the world
- major oceans of the world
- Indian Ocean, Pacific Ocean, Atlantic Ocean, Arctic Ocean

**5. Research and Review (Project work)**

Make a project file on given topics (Already assigned to students) General instructions:-

- No. of pages should be 15-20.
- File should be well bound.

Ch-1 Introduction to maps 11.pdf

Ch-2 maps scale 11.pdf

## BUSINESS STUDIES

- **Revise Unit 1- Nature and purpose of Business.**
  - **Unit 2 Forms of Business Organization.**
  - **Do the Assignment shared in whats app group.**
  - **Write any 10 Business news for 10 consecutive days.**
  - **Do any one Project from the following topic.**
1. **Visit to a whole sale market: vegetables/fruits/flowers/grains/garments etc. The students are required to observe the following:**
    - a) Sources of merchandise. b) Local market practices. c) Any linked up businesses like transporters, packagers, money lenders, agents, etc. d) Nature of the goods dealt in. e) Types of buyers and sellers. f) Mode of the goods dispersed, minimum quantity sold, types of packaging employed. g) Factors determining the price fluctuations.

**OR**

**2. Visit to a Departmental store: The students are required to observe the following:**

- a) Different departments and their lay out. b) Nature of products offered for sale. c) Display of fresh arrivals. d) Promotional campaigns. e) Spaces and advertisements. f) Assistance by Sales Personnel. g) Billing counter at store – Cash, Credit Card/ Debit Card, swipe facility. Added attractions and facilities at the counter. h) Additional facilities offered to customers i) Any other relevant aspect.

**OR**

**3. Visit to a Mall: The students are required to observe the following:**

- a) Number of floors, shops occupied and unoccupied. b) Nature of shops, their ownership status c) Nature of goods dealt in: local brands, international brands, d) Service business shops- Spas, gym, saloons etc. e) Rented spaces, owned spaces, f) Different types of promotional schemes. g) Most visited shops. h) Special attractions of the Mall- Food court, Gaming zone or Cinema etc. i) Innovative facilities. j) Parking facilities.

## MUSIC

- Write and learn the following topics
- Definitions - Sangeet, Swar, Saptak, Aaroh, Avroh, Naad, Khayal, Raag, Shruti.
- Taal - Teen taal, Kehrava taal
- Biography - Tanseen
- PROJECT WORK:- Learn any one bhajan

## BIOLOGY

1. Write experiments of section A and section B in Biology practical file.
2. Prepare investigatory report according to the topics allotted in the class. Also do case studies in investigatory report.
3. Do MCQs of unit 1
4. Write question answers of NCERT text exercise.

## ACCOUNTANCY

1. Revise all the chapters covered in class  
Ch. 1. Meaning and objectives of accounting  
Ch. 2. Basic accounting terms  
Ch. 6. Accounting Equation  
Ch. 7. Double entry System  
Ch. 8. Source documents of accountancy  
Ch. 9 Journal
2. Complete all the assignments given in modules
3. Imagine any business unit, choose its name, prepare sample vouchers including debit, credit and non cash vouchers. Collect or create the source documents like cash memo, Bills/invoice, receipts, counterfoils of bank slips, cheque, debit note & credit note (take help of text book for format) and paste them in their project file duly filled on the basis of transactions
4. Prepare PPT on the following topics with 5 Multiple choice questions  
(i) Two questions on covered topics of accountancy  
(ii) Identification of any famous personality related with business world  
(iii) Identification of business logo  
(iv) Famous newspapers Editor's name

## PAINTING (FINE ARTS)

- ❖ Draw still life any 2.
- ❖ Draw any creative Art work.
- ❖ Prepare MCQ/ one word answers of introduction to art work.

## CHEMISTRY

### Kindly Note: -

1. The homework should be in very neat handwriting.
2. Try to use homemade or used material left at home to complete homework, to avoid moving out of home.
3. Avoid mobile, laptop or computer usage in holidays. Enjoy the holidays its vacation time not burden time.
4. Try to speak sentences in English language more at home to improve your pronunciation.
5. Read a loud page of Newspaper or a story regularly.
6. Clean your home and take care of your personal hygiene.
7. Help your parent in household work .
8. Sit for 15 minutes with parents for interaction or discussion on any topic.
9. Love nature & try to saw a seed and see it growing.
10. Exercise daily for 30 minutes with your family member.
11. Make schedule of whole day.
12. Eat healthy to increase immunity of your body.
13. Increase aesthetics values at home.
14. Try to help who is in need at this difficult time.
15. Watch News daily.
16. Stay home, stay safe.

- SOME BASIC CONCEPTS OF CHEMISTRY ASSIGNMENT
- ATOMIC STRUCTURE ASSIGNMENT
- COMPLETE CHEMISTRY FILES
- Activities:- Explain and Make a video of any topic of chemistry

## **POLITICAL SCIENCE**

1. Read Chapter-1 'Constitution – Why and How?' and Chapter-2 'Rights In The Indian Constitution'.
2. On the political map of India locate the states having bi-cameral legislature.
3. Prepare any one project and any one power point presentation on any one of the given topics.
  - Project and Power point presentation may be on the same topic or different topics.
  - Individual student or two students may prepare one power point presentation
 'Indian Constitution, Election and Representation, The Legislature, The Executive, The Judiciary 6 Federalism, Local Governments, Political Theory: An Introduction, Liberty, Equality, Justice, Rights, Citizenship, Nationalism, Secularism and Development'
4. Find out the answer of the following assignment and write the answer in your political science note book.

### **Chapter-1, 'Constitution: Why and How?'**

1. Write the preamble of Indian constitution.
2. What are the unique features of Indian constitution?
3. Mention the sources of Indian constitution along with the features taken from the sources.
4. Who was the chairman of the drafting committee?
5. Name the president of the constituent assembly.
6. What is the philosophy of Indian Constitution? Discuss.
7. Write a note on the constituent assembly.
8. Indian constitution contains some provisions for social justice. Explain.
9. 'India is a sovereign, democratic. Republic'. Justify the statement.
10. What is a constitution? How can we say that Constitution is a living document?

### **Chapter-2 Rights in The Indian Constitution**

1. Describe the main features of Fundamental Rights.
2. Write the fundamental Duties.
3. Explain the 'Directive Principles of State Policy'.
4. Write a short note Right to Property.

### **Chapter-3, 'Election and Representation'**

1. What is democracy?
2. What is meant by a direct democracy?
3. Explain the role of election commission of India.
4. How does the election commission of India ensure its independence?
5. What is the composition of election commission of India?
6. Suggest some major suggestions for electoral reforms.
7. What is the electoral process in India?
8. Sometimes criticism has taken place against universal adult suffrage. Explain.

9. How does India ensure the secret ballot?
10. How does election commission recognize the regional party?

#### **Chapter-4, 'Executive'**

1. Describe the powers and functions of the president of India.
2. Describe the powers and functions of the prime minister of India.
3. What is the Veto power and pocket veto of the president of India?
4. Do you think that the presidential form of govt. is the most suitable for India? Justify.
5. Write a short note on single executive and plural executive.
6. Mention the situations to when a governor can use his discretionary powers.
7. Distinguish between the political executive and permanent executive.
8. How is the president of India elected?
9. Write a short note on the relationship between the president and the prime minister.
10. What do you understand by the dominance of executive leadership?

### **HISTORY**

#### **1. Recall and Revise**

Learn Ch.2 and ch.3

#### **2. Explore and Elaborate**

Read all sources of Ch.2 and ch.3. Also frame at least three questions/answers from each source. Frame 10 objective type questions form each chapter.

#### **3. Locate and Label**

On an outline map of world mark the sites mentioned in Map List given.

#### **4. ART INTEGRATED ACTIVITIES**

1. Prepare time line chart, wall magazine on Roman empire.
2. Make clay tablet of Mesopotamian cuneiform script.

#### **5. Research and Review**

(Project work)

Make a project file on given topics (Already assigned to students)

#### **General instructions:-**

- No. of pages should be 15-20.
- File should be well bound.
- Pages should be placed in following order-
- Titlepage-Certificate-Acknowledgement-Index-Project-Content-Questionnaire
- -Bibliography-Conclusion page.
- The Project file must contain graphs, maps, pictures, pie charts and sketches.

### **PSYCHOLOGY**

#### **ASSIGNMENT 1**

- Q1 Explain the term behaviour What are the different types of behaviour that one can see? Give examples.
- Q2 'Psychology refers to the scientific study of human behaviour' Explain the nature of Psychology by

giving examples.

- Q3 What role does Humanistic view play in the development of an individual's self and why?
- Q4 How does Developmental Psychology play an integral role in the various stages of life of an individual?
- Q5 Differentiate between clinical and Counseling Psychology?
- Q6 How is Psychology becoming an integral part of various other fields and disciplines? Explain with the help of any 3 examples
- Q7 What similarities do health and community psychologists share in the development and betterment of society?
- Q8. What are the various opportunities that a person from the Psychology background has to build up his career?

## **ASSIGNMENT 2**

- Q1 What are the goals of psychological enquiry? Give examples.
- Q2 With the help of a diagram explain the steps of a scientific research
- Q3 Define the following terms:
  - (a) Objectivity
  - (b) Sample
  - (c) Data
  - (d) Hypothesis
- Q4 Explain the steps and procedure of a scientific research.
- Q5 What are the various types of data or information that is collected in psychological enquiry?
- Q6 Differentiate between:
  - (a) Naturalistic and controlled observation
  - (b) participant and non participant observation
  - (c) Control and experimental group
  - (i) Give examples in support of your answer
  - (ii) Write the advantages and disadvantages of observation method?
- Q7. Explain the important aspects of correlational research and define the characteristic in detail.
- Q8. Differentiate between a survey and interview
- Q9 Explain the important characteristics of a good test
- Q10 'psychological research is expected to follow a certain ethics' Explain those ethics in detail with the help of diagram
- Q11. Differentiate between
  - (a) Verbal, non-verbal and performance test
  - (b) Individual and group test
  - (c) Power and speed test

## **Practical Work-**

1. Complete your project as discussed in the class.
2. Write down the first chapter of your practical file as discussed.

## **HOME SCIENCE**

### **Assignment 1**

1. List four self-employment opportunities available to you on the basis of the skills in meal planning and bakery that one acquires while studying home science.
2. Name four skills that you have achieved while doing home science course and which will help you in enhancing family income.
3. Suggest four ways in which knowledge of home science can be helpful in self-employment.
4. Name four occupations you can choose after you get trained in the course of child development.

5. List four self-employment opportunities available to you on the basis of the skills in 'meal planning' and interior decoration,' that one acquires while studying Home Science.
6. Anuradha needs to earn a living. Suggest to her four different ways by which she can use her knowledge of food and nutrition and child development to earn more money.
7. Home Science subject is equally important for boys and girls'. Comment.
8. Give four reasons for the importance of Home Science in your life.

### **Case Study Based Questions**

In the early 20th century there were many institutions in different parts of the country that had introduced courses in Foods and Nutrition, Clothing and Textiles, as well as Extension Education. These different Disciplines were brought under the rubric of Home Science in 1932, when an institution by the name of Lady Irwin College was set up in Delhi to promote women's education. This was the time before India's Independence from the British rule, when very few girls attended school, and hardly any institutions for women's higher education existed. A few eminent women were in the vanguard of the movement to liberate India. Among them were Sarojini Naidu, Rajkumari Amrit Kaur and Kamaladevi Chattopadhyay, stalwarts of the All India Women's Conference, who conceived of and established the Lady Irwin College. The British Viceroy in India at that time was Lord Irwin, and his wife, Lady Dorothy Irwin too supported the setting up of the college. Hence, the College was set up in her name. The goal was to serve the home and society with equal resolve, so as to remove social and educational inequalities that prevented women from reaching their potential.

#### **Questions:**

- (i) Which among the following was not the aim of setting up Home Science college in India
  - (a) To help women to reach their potential
  - (b) To fight against social inequality
  - (c) To overcome educational inequality
  - (d) To make better home makers
- (ii) Before India's independence which was the first college to be started to promote women education
 

(a) Lady Shree Ram College.	(b) Kamla Nehru College
(c) Lady Irwin College	(d) Queen's College
- (iii) During the initial years of Home Science Education, which of the following subject was not clubbed with other subjects under the rubric of Home Science subject.
 

(a) Clothing and Textiles	(b) Food and Nutrition
(c) Child Development.	(d) Extension Education
- iv) Which among the following terms is not associated with Home Science-
 

(a) Multi disciplinary subject	(b) Gender biased subject
(c) Adolescence	(d) Quality of life

### **Assignment 2**

20. At what age, self-recognition starts in Infancy? Ans. At 18 months, they start self-recognition and use words like my, mine, me,
21. By which age the child starts recognizing himself in photo?

### **Short Answer Questions**

1. Give definition of self?
2. Write two concepts related to self-identity.

3. Discuss the importance of knowing oneself and the significance of developing a positive sense of self.
4. List the factors that influence the development of selfhood and identity. 5. Classify the influences on the formation of Identity?
6. Differentiate between negative and positive self-esteem. 7. Why is it important to understand the self?

### **Long Answer Questions**

1. Explain the self recognition at different levels.
2. Discuss identity and its types.
3. "Adolescence is a time when all adolescents experience identity crisis". Do you agree with this statement? Give reasons for your answer.

### **Case Study Based Questions**

Self has several dimensions- self as personal and the social. The personal self has those aspects which relate only to you while the social self refers to those aspects where you are involved with others, and includes aspects like sharing, cooperation, support and unity. In simple words, self refers to the totality of a person's experiences, ideas, thoughts and feelings with regard to herself/himself. It is the characteristic way in which we define ourselves. The idea that we hold of ourselves is the notion of the self.

We have also heard and used the terms self-concept and self-esteem with reference to yourself and with others. Self-concept and self-esteem are elements of identity. Self-concept is a description of oneself. It answers the question of 'Who am I?'. Our self-concept includes our qualities, feelings and thoughts and what we are capable of doing. Whereas, self-esteem refers to our judgment of ourselves according to the standards we have set for ourselves which are largely influenced by society. It is one's evaluation of oneself.

- (i) The totality of a person's experiences, ideas, thoughts and feelings with regard to herself/himself is termed as-
 

(a) Judgement	(b) Knowledge
(c) Self.	(d) Belief
- ii) Attributes of a person which makes him/her different from others is known as-
 

(a) Self concept.	(b) Personal identity
(c) Self esteem	(d) Social identity
- iii) Judgment of self according to the standards we have set for ourselves, is known as-
 

(a) Personal self.	(b) Self esteem
(c) Self concept.	(d) Social self
- (iv) Awareness about our qualities, feelings and thoughts and what we are capable of doing, is known as
 

(a) Personal self	(b) Self esteem
(c) social self.	(d) self concept

### **Assignment 3 Short Answer Questions**

1. Write the characteristics of self during early childhood?
2. Explain any two characteristics of young children in understanding themselves. 3. Explain any two key changes that increase complexity during middle childhood.
4. Mention any three reasons for identity crisis during adolescence.
5. Mention any three characteristics of adolescent's sense of self.
6. What are the main characteristics of young children in understanding themselves.



### Long Answer Questions

1. Explain how a family can help in the sense of Identity of adolescence?
2. Write the characteristics of self during early childhood?
3. Mention some characteristics of self during infancy?
4. Explain some characteristics of young children in understanding themselves.
5. What are the key changes that increases complexity during middle childhood.
6. Explain development of self during adolescence.

### Assignment 4

#### Long Answer Questions

1. You are aspiring to go to medical college How would the various steps of management help you in admission to this course?
2. What is the benefits of evaluation?
3. Give classification of resources. Explain material resources. How do they differ from human resources?
4. 'Resources are limited. Justify the statement by giving an example. 5. Name various human resources Explain in brief.
6. Name any five community resources available around your house How can these be conserved?
7. Explain controlling with the help of suitable examples.
8. In your school your annual exam is going to held and in this annual exam only 3 months are left .You want achieve good marks in the annual exam so how you will manage your resources for achieving this goal?

#### Case Study Based Questions

1. None of the resources are unlimited. All resources are finite We need to utilise resources effectively to achieve our goals faster and efficiently. Resources, therefore should not be misused and wasted. Thus, to achieve ou goals, effective management of resources is extremely essential Managing resources is about getting the most from the resources which are available to us For example, everybody has 24 hours in a day. While some plan their schedule everyday and utilise every hour to achieve their goals others waste their time and are not able to do anything productive throughout the entire day.  
Management of resources involves implementing resource management procedures which include planning organising, implementing, controlling and evaluation.
  - (i) is a scheme for action to achieve specified goals by using the available resources
    - (a) Organising.
    - (b) Planning
    - (c) Controlling.
    - (d) Implementation
  - (ii) Arranging things in an orderly manner refers to-
    - (a) Planning.
    - (b) Implementation
    - (c) Organising.
    - d) controlling
  - (iii) When a plan has been made, and resources organised, it is then put into actual practice, this is known as-
    - a) organising.
    - b) controlling
    - c) planning.
    - d) implementation
  - iv) ..... is the last stage of management process in which the success or failure of a plan is assessed.
    - (a) organising
    - b) evaluation
    - c) implementation
    - d) controlling

## Practical Work

**Write the following practical is on a three size sheets-**

1. to understand oneself with reference to the peer group.(page 288)
2. a) record the fabrics and apparel used in a day.  
b) Categorisethem according to functionality.(page294-295)
3. Prepare a time plan for yourself (page296)
4. Analyse the information given one food product and prepare a label.(page 312)

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**ENGLISH**

- Research on the Egyptians civilizations –with particular reference to Tut’s Mummy and its discovery. Stick pictures.
- Research on Khushwant Singh’s life and works.
- Research on sailing terminology and parts of a boat and gather information about Isle Amsterdam.
- Design a poster as an appeal for conserving water as most parts of India are facing serious problems and have been hit by drought.
- Do NOTES MAKING of L-1, 2 & 3 of SNAPSHOT.
- Cut out 5 clippings of Classified Ads under the heads –
  - \*For sale
  - \*To-let
  - \*Situation vacant

\*For matrimonial

\*Pets / kennels

1. Look at the famous painting 'Days of Glory ' by Satish Gujral and answer the questions that follow based on your interpretation of .



- a) Suggest an alternative title for this painting .
- b) Narrate a story based on your interpretation of the painting.
- c) What inspired the painter to draw this particular painting ? Write a few words about the painter and his style of painting.

#### [Research based activity]

- Collect ideas on the topic to be chosen for English Project. Create a WATSAPP group of your Team Members and initiate conversation on various steps to make the project.
- Conduct virtual meet for discussions and keep all evidences .

**NOTE : The Holiday Homework should be done in Class Notebooks .**

### PHYSICS

1. Measure the temperature from 15<sup>th</sup> june to 25<sup>th</sup> june at 7am and 2pm daily and prepare a chart showing increase in temperature with error
2. Prepare a chart writing the dimensional formula of different physical quantities(at least 20)
3. Taking slide caliper and a scale measure the length of different object and prepare a chart showing variation in accuracy
4. Solve all the unsolved problems from NCERT book belonging chapter unit and measurement and scalars and vectors

### CORE-MATHEMATICS

1. Revise chapters 1,2,,4, from NCERT and Elements of Mathematics.
2. Do the assignments attached below on a separate notebook.

## Assignment-CHAPTER(1)

### (SECTION A- 1 mark questions)

Q1. Write the roster form of  $H = \{x/ x \in N \text{ and } 5 < x^2 < 50\}$ .

Q2. Give example of two sets whose intersection is an empty set.

Q3. How many subsets a set has containing 5 elements.

Q4. Write the set  $\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots\right\}$  in set builder form.

Q5. Define power set.

### (Section B- 2 mark questions)

Q6. Write all the subsets of the set  $\{\phi, 1\}$ .

Q7. Find sets A, B and C such that  $A \cap B, B \cap C$  and  $A \cap C$  are non empty sets and  $A \cap B \cap C = \phi$ .

Q8. Two finite sets having m and k elements. If the total number of subsets of the first set is 56 more than the total number of subsets of second set, then find m and k.

Q9. For all sets A, B and C, is  $(A \cap B) \cup C = A \cap (B \cup C)$ ? justify your answer.

Q10. If  $U = \{1, 2, 3, \dots, 10\}$ ,  $A = \{x: x \text{ is prime}\}$ ,  $B = \{x: x \text{ is even integer}\}$ . Then write the value of  $A \cap B^c$ .

### (Section C – 4 mark questions )

Q11. A and B are two sets such that  $n(A - B) = 14 + x$ ,  $n(B - A) = 3x$  and  $n(A \cap B) = x$ . draw a venn diagram to illustrate this information. If  $n(A) = n(B)$ , find (1) the value of x (2)  $n(A \cup B)$ .

Q12. A survey shows that 63% people watch news channel A whereas 76% watch news channel B. if x% watch both the channels , prove that  $39 \leq x \leq 63$ .

Q13. If  $P(A) = P(B)$ , show that  $A = B$ .

Q14. Let A and B be sets. If  $A \cap X = B \cap X = \phi$  and  $A \cup X = B \cup X$  for some set X, show that  $A = B$

## Assignment-CHAPTER(2)

1. If the ordered pair  $(x-1, y+3)$  and  $(2, x+4)$  are equal, find  $x$  and  $y$ .
2. If  $A = \{1, 2\}$ ,  $B = \{2, 3\}$  and  $C = \{0\}$  find  $A * B * C$ .
3. Find  $a$  and  $b$  if:
  - i.  $(a+1, b-2) = (3, 1)$ .
  - ii.  $(\frac{a}{3} + 1, b - \frac{2}{3}) = (\frac{5}{3}, \frac{1}{3})$
  - iii.  $(2a, a + b) = (6, 2)$
  - iv.  $(a + b, 3b - 2) = (7, -2)$
4. If  $P = \{1, 2\}$ , form the set  $P \times P \times P$ .
5. Given that  $B = \{2, 3, 5\}$  and some elements of  $A \times B$  are  $(a, 2), (b, 3), (c, 5)$ . Find the Set  $A$  and the remaining ordered pairs of  $A \times B$  such that  $A \times B$  is the least.
6. If a relation  $R = \{(0, 0), (2, 4), (-1, -2), (3, 6), (1, 2)\}$ , then
  - i. Write domain of  $R$ .
  - ii. Write range of  $R$ .
  - iii. Write  $R$  in the set builder form.
  - iv. Represent  $R$  in arrow diagram.
7.  $A = \{-1, 2, 5, 8\}$ ,  $B = \{0, 1, 3, 6, 7\}$  and  $R$  be the relation "is one less than" from  $A$  to  $B$ , then a) find  $R$  as a set of ordered pairs.  
b) find domain and range of  $R$ .
8. Let  $R$  be the relation on  $N$  defined by :  $R = \{(a, b) : a \in N, b \in N \text{ and } a + 3b = 12\}$ , then
  - a) list the elements of  $R$
  - b) find the domain of  $R$
  - c) find the range of  $R$ .
9. Which of the following are functions ? Give reasons. If it is a function, determine its domain and range.
  - i.  $\{(1, 1), (1, 2), (1, 3), (1, 4)\}$
  - ii.  $\{(a, b), (b, c), (c, d), (d, e)\}$
  - iii.  $\{(1, 2), (3, 1), (1, 3), (4, 1)\}$
  - iv.  $\{(2, 1), (0, -1), (3, 1), (5, 4), (-1, 0), (3, 4), (1, 0)\}$
10. Let 'f' be a function defined by  $f : R \rightarrow R$  as  $f(x) = 4x + 7$ , when  $x \leq 3$  and  $f(x) = 4$ , when  $x > 3$ . Show that  $f$  is a function.
11. If  $f$  is a real function defined by  $f(x) = x + \frac{1}{x}$ ,  $x \in R - \{0\}$ ,  
then show that  $(f(x))^3 = f(x^3) + 3f(\frac{1}{x})$ .
12. Find the domain and range of the following functions:
  - a)  $f(x) = \frac{1}{x-2}$  b)  $f(x) = \frac{x}{x+5}$  c)  $f(x) = \frac{x}{x^2+3}$  d)  $f(x) = \frac{1}{(2x-3)(x+1)}$  e)  $f(x) = \frac{1}{\sqrt{9-x^2}}$ ,

1. Express each of the following in the form  $a + ib$ :

- i.  $(1-i)^2$
- ii.  $(-2 - \frac{1}{3}i)^3$
- iii.  $(2i - i^2)2 + (1 - 3i)3$
- iv.  $(i^{18} + (\frac{1}{i})^{25})$
- v.  $i^n + i^{n+1} + i^{n+2} + i^{n+3}, n \in \mathbb{N}$

2. Show that the real part of  $(2+3i)(2-3i)(1+i)$  is zero.

3. If  $a = 3+2i$  and  $b = 3-2i$ , then show that :  $a^2 + ab + b^2 = 23$

4. If  $(\cos \theta + i \sin \theta)^2 = x + iy$ , then show that  $x^2 + y^2 = 1$ .

5. Find the real values of  $x$  &  $y$  for the following functions :

- i.  $2x + iy = 4 + 5i$
- ii.  $\frac{x-i}{3+2i} + \frac{x+i}{3-2i} = \frac{1+3i}{1-3i}$ .
- iii.  $(3y - 2)i^{16} + (5 - 2x)i = 0$ .
- iv.  $(\frac{1}{3}x - \frac{1}{4}y) + \frac{3}{4}yi = -3 + 5i$ .
- v.  $3x + 2yi + 5 - 2i = 7 - 3i$ .

6. If  $a + ib = \frac{(x+i)^2}{2x^2+1}$ , prove that :  $a^2 + b^2 = \frac{(x^2+1)^2}{(2x^2+1)^2}$ .

7. Find the multiplicative inverse of the following:

- i.  $1 - i$
- ii.  $4 - \sqrt{-9}$ .
- iii.  $(3+i)(1+2i)(1-i)$ .
- iv.  $\frac{2-3i}{3+2i}$ .

8. Write the additive inverse of following :

- i.  $1 + 2i$ .
- ii.  $-3+2i$ .
- iii.  $-5i - 3$
- iv.  $7 - 2i$ .

9. Write the modulus and argument, hence write in polar form of the following :

- i.  $-1 + i$
- ii.  $4\sqrt{3} + 4i$
- iii.  $\frac{1+2i}{1 - (1-i)^2}$
- iv.  $\frac{(1+i)^{13}}{(1-i)^7}$