

INTERNATIONAL INDIAN SCHOOL DAMMAM

CLASS: XI

SUB: ACCOUNTANCY

HOLIDAY ASSIGNMENT 2017-2018

- I. Collect an Invoice, Cash memo, Cheque leaf, Pay - in- slip and a copy of Bank statement.
- II. Answer the following
1. Define accounting.
 2. Explain the following terms:
 - a) Debtor b) Voucher c) Drawings d) Capital
 3. Explain cash basis and accrual basis of accounting .
 4. Explain the advantages of accounting.
 5. Explain the advantages of IFRS?
 6. Differentiate between cash discount and trade discount.
 7. Explain the disadvantages of accounting.
 8. Explain the following concepts:
 - a) Conservatism b) Full disclosure c) Business entity
- III. Journalise the following
1. Commenced business with cash Rs 50,000 .
 2. Purchased machinery for Rs 5,000 from Ramesh .
 3. Deposited into bank Rs 9,000.
 4. Sold furniture to Mahesh of the list price of Rs 1,000 and allowed him 5% trade discount.
 5. Received a first and final dividend of 60 paise in a rupee from the official receiver Mr. Ranjan, who owed us Rs 1,000.
 6. Purchased goods from Raja Rs 50,000 less trade discount of 20% plus VAT @ 5%.
 7. Sold goods for Rs 15,000 to Niraj plus VAT @ 5%.
 8. Received Rs 765 from Narindra in full settlement of a debt to his account for Rs800.
 9. Paid rent in advance Rs 500.
- IV. Prepare triple column cash book from the following transactions:
- 2015 Jan. 1 Commenced business with cash Rs. 60,000.
Jan. 2 Deposited in to Bank Rs. 40,000.
Jan. 3 Bought building by cheque Rs. 25,000.
Jan.5 Paid to Mohan by cheque Rs.1,900 in full settlement of his account Rs. 2,000.
Jan. 6 Withdrew from bank for office use Rs.1,000.
Jan. 15 Received a cheque from Rohan Rs. 2,450. Allowed him discount Rs. 50.
- V. Prepare purchase book from the following transactions.
- 2009
- February 1: Purchased from M/s Brown & Co. on credit. Invoice no 1125
5 gross pencils @ Rs 100 per gross
1 gross registers @ Rs 200 per dozen
Less: Trade discount @ 10%
- February 2: Purchased for cash from Stationary Mart. Invoice no 1320
10 gross exercise books @ Rs 60 per dozen
- February 3: Purchased computer printer for office use from M/s Office Goods Co. on credit.
Invoice no 1420, for Rs 4000.
- February 4: Purchased on credit from the Paper Co. Invoice no 1640
5 reams of white paper @ Rs 100 per ream
10 reams of ruled paper @ Rs 65 per ream
Less: Trade discount @ 10%
Cartage paid Rs 20.

VI. Prepare a sales book from the following information for M/s. Hutch Traders

DATE	PARTICULARS
01.12.2015	Sold to Arrow Traders 33 squares @ Rs. 100 each 24 shirts @ Rs. 180 each 36 T-shirts @ Rs. 125 each
08.12.2015	Sold for cash to Linen Traders 26 pants @ Rs. 400 each 32 suits @ Rs. 1,200 each 12 shirts @ Rs. 300 each
19.12.2015	Sold to Indigo Nation & Co 100 cotton saris @ Rs. 350 each 75 silk saris @ Rs. 600 each 200 chiffon saris @ Rs. 250 each

VII. Prepare accounting equation based on the following information:

- Commenced Business with Cash: Rs. 2, 25, 000
- Purchased goods for Rs. 40, 000
- Wages paid Rs. 600
- Sold goods for Rs. 2, 500
- Salary paid in advance Rs. 2, 000
- Purchased Machinery Rs. 5, 400

VIII. Post the following transactions into ledger & prepare a trial balance

DATE	PARTICULARS	AMOUNT
01.01.15	Started business with cash	50,000
03.01.15	Purchased Furniture	7,000
08.01.15	Purchased goods from Suresh	16,000
13.01.15	Paid to Suresh in full settlement	14,800
19.01.15	Deposited into bank	6,000
23.01.15	Paid Salary	3,500
25.01.15	Commission Received	1,250
28.01.15	Withdrew goods for personal use	2,000

NOTE:

- Collect the documents for question No. 1 and keep it ready for project.
- Prepare a booklet for all the questions from 2 to 8 and submit on or before 20 - 09-2017.

Amir

INTERNATIONAL INDIAN SCHOOL, DAMMAM

Holiday Assignment

Class – XI

Subject : English

Q-1) You are Vijay / Vijaya staying at B-1, Breezy Nest, Lucknow. Write a letter to the Editor of Lucknow Times highlighting the necessity of having better facilities for pedestrians by improving the condition of the footpaths in your city.

Q-2) Aftab / Afreen, a student of class XI feels highly disturbed when he reads about the hike in the prices of essential commodities like gas, pulses, vegetables etc. Write an article on 'Price-hike of Essential Commodities' for publication in a local daily, suggesting certain steps to curb this matter.

Q-3) You are Sanjay / Sania. You have secured 95 per cent marks in English. Your English teacher has persuaded you to share the secret of your success with your schoolmates. You decide to deliver a speech 'English is an extremely scoring subject' in the morning assembly. Write the speech in about 150 – 200 words.

Q-4) 'Cinema Fire claims 85'. This is the newspaper heading. Write a report on the incident mentioning the following points. Your report should be in about 150 words.

- place
- What, where, when
- Details of the cause of fire
- People injured, extent of damage
- Government's response / action

Q-5) You are making an effort to spread the message of communal harmony. Prepare a poster with catchy slogans to be displayed in the school premises. (Word limit: 50 words)

INTERNATIONAL INDIAN SCHOOL DAMMAM
SUMMER VACATION ASSIGNMENT (BSSS)
CLASS - XI (CHEMISTRY) [2017 -2018]

CLASSIFICATION OF ELEMENTS

1. What would be the IUPAC name and symbol for the element of atomic number
(a)115 (b) 120

2. Give reasons :

(i) First I.E. of Mg is more than Sodium but second Ionisation energy of Mg is less than Sodium.

(ii) Cations are smaller and anions larger in radii than their parent atom .

(iii) Fluorine has less negative electron gain enthalpy than chlorine.

(iv) Lanthanides & actinides are placed in separate rows at the bottom of the periodic table.

(v) The bond dissociation energy of Fluorine is lesser than Chlorine.

(vi) The first ionisation enthalpies for two isotopes of the same elements are same.

SOME BASIC CONCEPT OF CHEMISTRY

1. (i) Define:(a) limiting reagent (b) Molarity (c) Molality (d) Mole fraction (e) Precision & accuracy

iii) State the law of definite proportions .

(iii) Out of 1M and 1m , whose concentration is higher .

(iv) Which one is temperature dependent , Molarity or Molality and why ?

CHEMICAL BONDING & MOLECULAR STRUCTURE

1. Discuss the shape of the following molecules using the VSEPR model:

BeCl₂, BCl₃, SiCl₄, AsF₅, H₂S, PH₃, NH₃, H₂O , ClF₃ ,XeF₄ ,SF₄

2. Compare the bond order, relative stability, of the following species and indicate their magnetic properties;

(i) N₂ (ii) O₂ (iii) O₂⁺ (iv) O₂⁻ (superoxide) (v) O₂²⁻(peroxide)

3. Describe the hybridisation in case of PCl₅ and SF₆.

STRUCTURE OF ATOM

1. State the following : (i) Hund's rule (ii) Heisenberg's uncertainty principle. (iii) Aufbau principle (iv) Pauli's exclusion principle .(v) n + l rule (vi) de Broglie relation and its use (vii) photo electric effect with expression.

HYDROGEN

1. Write short notes on : **(i)** hydrogen economy **(ii)** hydrogenation **(iii)** 'syngas' **(iv)** water-gas shift reaction **(v)** fuel-cell.
2. What do you understand by (i) electron-deficient, (ii) electron-precise, and (iii) electron-rich compounds of hydrogen? Provide justification with suitable examples.

ENVIRONMENTAL CHEMISTRY

1. Explain the following :
 - (i) Pesticides (ii) herbicides. (iii) Tropospheric pollution (iv) Eutrophication
 - (v) Methemoglobinemia (vi) BOD (vii) COD (viii) Acid rain
2. (i) Green house gases and the consequences of their absence in the earth's atmosphere.
(ii) What is Green chemistry and what are its role in decreasing environmental pollution.
3. (i) Describe Ozone hole and its consequences.
(ii) What is the effect of depletion of ozone layer .
(iii) Write the reactions involved for ozone layer depletion in the stratosphere.
4. (i) Distinguish between classical smog & photochemical smog .
(ii) Write the reactions involved during the formation of photochemical smog.
(iii) Write in brief the harmful effect of photochemical smog .
(iv) How photo chemical smog can be controlled .
5. Give reason :
 - (i) CO is more dangerous than CO₂ .
 - (ii) Abundance of phytoplankton in lake is responsible for killing fishes .

INTERNATIONAL INDIAN SCHOOL –DAMMAM

HOLIDAY ASSIGNMENT

CLASS :11

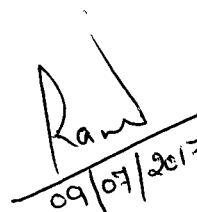
SUBJECT: BIOLOGY

1. Structural organization of cockroach (External morphology and all systems)
2. Epithelial tissue , Connective tissue, Muscular tissue ,Neural tissue (Explanation with diagrams)
3. Diagrams of
 - (a) Human eye
 - (b) Human brain
 - (c) Human Kidney
 - (d) Human heart.
 - (e) Aestivation in plants and Placentation in plants.
4. Mineral nutrition (Role of Nutrients in Plants, Page no:196 , 12.2.2 and 12.2.3)

Note: Students will do assignment on A₄ size paper.

List of experiments /topics to write in the lab record.

1. Study and description of families Solanaceae , Fabaceae and Liliaceae
2. Prepration and study of T.S of dicot and monocot roots and stems.
3. Study of plasmolysis in epidermal peels.
4. Test for the presence of Sugar,Starch,Proteins and Fats.
5. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
6. Study of the parts of a compound microscope.
7. Study of the specimens/slides/models and identification with reasons - Bacteria, Spirogyra, Rhizopus, , yeast and one lichen.
8. Study of specimens/slides/models and identification with reasons - Hydra, Ascaris, , Shark, Rohu, Frog, Lizard, Pigeon and Rabbit.
9. Study of mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.
10. Study of different modifications in roots, stems and leaves.
11. Study of imbibition in seeds/raisins.

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09/07/2017
(RASHID RAZA)

INTERNATIONAL INDIAN SCHOOL, DAMMAM
COMPUTER SCIENCE (CLASS XI)
HOLIDAY ASSIGNMENT- 2017-18

CHAPTER: PROGRAMMING METHODOLOGY

B555

1. Why a program should have a good presentation style?
2. What are the different stylistic guidelines in a program development?
3. What is the role of comments and indentation in a program?
4. What is a prologue?
5. What is free formatting?
6. What is pretty printing?
7. What is echo printing?
8. What are the characteristics of a good program?
9. What are the different stages of program development?
10. What do you mean by source code and object code?
11. What is meant by robustness?
12. What is meant by guard code?
13. What is a bug?
14. What are the different types of errors?
15. What are the different types of compilation errors?
16. What are run time errors?
17. What are logical errors? Why are logical errors harder to locate?
18. What is known as exception?
19. What is exception handling?
20. Mention the different steps you would follow while writing a program.
21. What is meant by algorithm? Define flowchart.
22. What is testing?
23. What is debugging?
24. What is program verification?
25. What is program documentation? Explain the different types of documentation.
26. What is meant by program maintenance?
27. Explain the different types of maintenance.
28. What is modular programming?

HAND WRITTEN COPY TO BE SUBMITTED ON OR BEFORE SEPTEMBER 29TH

INTERNATIONAL INDIAN SECHOOL DAMMAM

HOLIDAY ASSIGNMENT (BSSS 2017)

CLASS XI

MARKETING

1. What is marketing?
2. Distinguish between Marketing and Selling.
3. Define market? Explain the types of market.
4. Distinguish between production and product concepts.
5. Explain Abraham Maslow's Need Hierarchy theory.
6. Explain Needs, wants, and demands.
7. Define Market Offering.
8. Explain importance to the marketers.
9. Explain importance to the customers.
10. Explain selling concept.
11. What is marketing mix?
12. Explain the 4 C's of marketing mix.
13. Explain product marketing mix.
14. Explain common pricing strategies.
15. What are the characteristics of marketing mix?
16. What are the importance of marketing mix?
17. "promotion includes four main tools". Explain each of these tools.
18. How does marketing mix influence the organization's growth?
19. Explain any 5 steps involved in developing a marketing mix.
20. State the various classification of products.

INTERNATIONAL INDIAN SCHOOL DAMMAM

Holiday Assignment(BSSS 2017-18)

Sub: Economics

Class: XI

Indian Economic Development

1. What were the main causes of India's agricultural stagnation during the colonial period?
2. Why was public sector given a leading role in industrial development during the planning period?
3. Explain the need and type of land reforms implemented in the agricultural sector.
4. What were the factors responsible for the high growth of the service sector?
5. Discuss economic reforms in India in the light of social justice and welfare.
6. Why did RBI have to change its role from controller to facilitator of financial sector in India?
7. Why are tariffs imposed? What is the meaning of quantitative restrictions?

Statistics for Economics

8. Distinguish between Primary data and Secondary data.
9. What are the difference between census method and sampling method.
10. Distinguish between sampling errors and non-sampling errors.
11. Construct a pie-chart from the following data.

Items	Expenditure
Labor	25
Bricks	15
Cement	20
Steel	15
Timber	10
Supervision	15

12. Draw a frequency polygon with the help of a histogram.

Wages In RS.	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of workers	10	18	35	30	20	12	8	3

13. Draw a Less than ogive curve and a More than ogive curve on the basis of the data given below and determine the value of median.

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No. of students	3	10	20	30	20	9	5	3

14. Calculate the missing frequency from the following data, when the arithmetic mean is 33.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	5	10	25	30	?	10

15. From the following table find out the value of median.

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	15	10	6	4

**XI BUSINESS STUDIES
HOLIDAY ASSIGNMENT**

1. Distinguish between economic and non –economic activities.
2. How do Auxiliaries to trade help industry and trade.
3. Explain the characteristics of business.
4. “Profit maximization should not be the sole objectives of a business.” Explain
5. Explain the nature of business risks. What are the various types of business risks faced by an enterprise?
6. What is the position of a partner, when
(a) He is a minor? (B) He attains majority?
7. Explain the merits and demerits of partnership form of business?
8. “One man control is the best in the world if that man is big enough to manage everything.” Comment?
9. “Company is an artificial person with separate legal entity, perpetual succession and common seal. “ Comment.
10. “A private company is superior to a public company.” Discuss this statement in the light of privileges of a private company.
11. Explain the merits and limitations of Joint Hindu Family.
12. State and explain the six steps required to raise the funds from the public, i.e, capital subscription by the company.
13. Difference between certificate of incorporation and certificate of commencement.
14. Why Memorandum of association is referred to as ‘Charter or Constitution of Company’?
15. Explain the steps taken by the Promoters in the Promotion of company.
16. What is prospectus? Is it necessary for every company to file a prospectus?
17. List the documents required for the incorporation of a company.
18. Explain the advantages of Public Private Partnership.
19. Define joint venture and explain its various benefits .
20. Distinguish between departmental undertaking, statutory corporation and government company.
21. Briefly explain the rationale of public sector enterprises in India.
22. “MNCs are not able to fulfill the hopes with which they were allowed to enter Indian markets”. State the safeguards which can be adopted by Government to ensure effective role of MNCs in the country.
23. How does Memorandum of Understanding help in improving performance of a Public sector Undertaking?
24. What was the role of the public sector before 1991?
25. Identify the following
 - a) The clause which mentions the name of the state, in which the registered office of the company is to be situated.
 - b) A document which invites deposits from the public or offers from the public for the subscription of shares or debentures of a company.
 - c) Main document or constitution of company
 - d) Partner who does not participate in the management affairs of the business of the firm actively.

Bhavna D
9/07/2017

INTERNATIONAL INDIAN SCHOOL DAMMAM

BSSS SUMMER ASSIGNMENT (2017-18)

SUBJECT – : PHYSICS (042) CLASS –XI

Submit your summer assignment within a week from reopening of the school in September along with complete practical record book.

CHAPTER 2 (UNITS AND MEASUREMENTS)

1. Write the dimensions of (a,b) in the relation $E = (b-x^2)/at$, where E is energy, x is distance and t is time.
2. The time period of oscillation of simple pendulum in an experiment is recorded as 2.56 s, 2.62 s, 2.70 s, 2.58 s, 2.45 s respectively. Find the time period, absolute error in each observation & percentage error.
3. Write down the number of significant figures in the following: (i) 3286 N (ii) 7100 kg (iii) 64.000 m (iv) 0.04192 Nm⁻¹.
4. Check the dimensional consistency of following equations: (i) $V = \sqrt{2GM/R}$ (ii) $T = 2\pi \sqrt{l/g}$
5. Assuming velocity v of viscous fluid flowing through a tube depends only upon its density ρ , radius of the tube r & the coefficient of viscosity of fluid η , show by the method of dimensions that $v = K\eta/\rho r$

CHAPTER 3 (MOTION IN A STRAIGHT LINE)

1. The distance travelled by a body varies directly proportional to the square of time. What type of motion this body has?
2. Find the distance travelled by the uniformly accelerated object moving in one dimension in nth second.
3. A balloon starts rising from the ground with an acceleration of 1.25 ms⁻². After 8 s, a stone is released from the balloon. Find the time taken by the stone to reach the ground after its release.

CHAPTER 4 (MOTION IN A PLANE)

1. At what angle the two forces ($F_1 + F_2$) & ($F_1 - F_2$) act so that the resultant is $\sqrt{2}(F_1^2 + F_2^2)$.
2. Two forces each of 4 N acts on a body at an angle of 60°. Find the magnitude and the direction of the resultant force acting on the body.
3. Explain (i) negative vector (ii) co-initial vector (iii) orthogonal unit vector (iv) equal vector.
4. Show that there are two angles of projection for which the horizontal range is same.
5. What is centripetal acceleration? Find its magnitude & direction in case of a uniform circular motion of an object.

CHAPTER 5 (LAWS OF MOTION)

1. Derive an expression for work done when a body is made to slide up a rough inclined plane.
 2. A golf ball of mass 60 g at rest is hit with a striker. Find the impulse of the hit if the ball stops after travelling a horizontal distance of 50 m with a uniform retardation of 4 ms⁻².
 3. Write the laws of limiting friction.
-

INTERNATIONAL INDIAN SCHOOL DAMMAM
HOLIDAY ASSIGNMENT – BSSS – 2017
CLASS XI
INFORMATICS PRACTICES – CHAPTER – CONTROL STRUCTURES

CONTROL STATEMENTS – if , if else - SYNTAX & OUTPUT QUESTIONS

LEARNING OBJECTIVES

1. Understand the concept and usage of selection “ if ” control structures in Java.
2. Analyze the problem , decide and evaluate condition.
3. Design simple applications using the “if ,if else” control statements.

Activity

4. Develop an application using Integrating GUI components to create Salary Calculator – Case Study 2 – Text Book Pg 287 – 295. Draw the form & write the coding to calculate earnings , deductions, Salary in Hand ,reset & stop buttons.

Note : Make a spiral binding booklet and submit it on or before 17th SEPT 2017 .

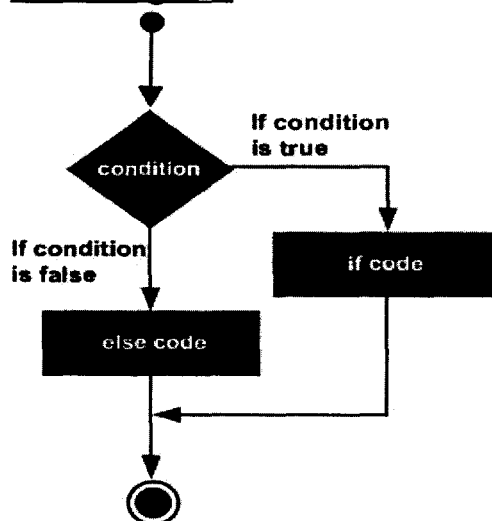
if statement : An **if** statement can be followed by an optional **else** statement, which executes when the Boolean expression is false.

Syntax

```
if(Boolean_expression) {  
    // Executes when the Boolean expression is true  
}else {  
    // Executes when the Boolean expression is false  
}
```

If the boolean expression evaluates to true, then the if block of code will be executed, otherwise else block of code will be executed.

Flow Diagram



The if...else Statement

An if statement can be followed by an optional *else if...else* statement, which is very useful to test various conditions using single if...else if statement.

When using if, else if, else statements there are a few points to keep in mind.

- An if can have zero or one else's and it must come after any else if's.
- An if can have zero to many else if's and they must come before the else.
- Once an else if succeeds, none of the remaining else if's or else's will be tested.

Syntax

```
if(Boolean_expression 1) {  
    // Executes when the Boolean expression 1 is true  
}else if(Boolean_expression 2) {  
    // Executes when the Boolean expression 2 is true  
}else if(Boolean_expression 3) {  
    // Executes when the Boolean expression 3 is true  
}else {  
    // Executes when the none of the above condition is true.  
}
```

Relational Operations		
Operator	Operations	Example
<	Less than	a	Greater than	a>b
<=	Less than or equal to	a<=b
>=	Greater than equal to	a>=b
=	Equal to	a==b
≠	Not equal to	a!=b

GIVE THE OUTPUT FOR THE FOLLOWING JAVA CODING

```
1. {  
    int x = 30;  
  
    if( x < 20 ) {  
        System.out.print("This is if statement");  
    }else {  
        System.out.print("This is else statement");  
    }  
}
```

```
2. {
  int number=13;
  if(number%2==0){
    System.out.println("even number");
  }else{
    System.out.println("odd number");
  }
}
```

```
3. {

  int testscore = 76;
  char grade;

  if (testscore >= 90) {
    grade = 'A';
  } else if (testscore >= 80) {
    grade = 'B';
  } else if (testscore >= 70) {
    grade = 'C';
  } else if (testscore >= 60) {
    grade = 'D';
  } else {
    grade = 'F';
  }
  System.out.println("Grade = " + grade);
}
```

```
4. {
  int x = 30;

  if( x == 10 ) {
    System.out.print("Value of X is 10");
  }else if( x == 20 ) {
    System.out.print("Value of X is 20");
  }else if( x == 30 ) {
    System.out.print("Value of X is 30");
  }else {
    System.out.print("This is else statement");
  }
}
```

INTERNATIONAL INDIAN SCHOOL, DAMMAM

HOLIDAY ASSIGNMENT(SUMMER): 2017-2018 CLASS: - 11TH

SUBJECT: MATHEMATICS

TRIGONOMETRIC FUNCTIONS

- 1) Prove that, $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ = \frac{3}{16}$
- 2) Prove that, $\sin^2 x + \sin^2 \left(x + \frac{\pi}{3}\right) + \sin^2 \left(x - \frac{\pi}{3}\right) = \frac{3}{2}$
- 3) Prove that: $\frac{\sin 11x \sin x + \sin 7x \sin 3x}{\sin x \cos 11x + \sin 3x \cos 7x} = \tan 8x$
- 4) Prove that: (i) $\tan 72^\circ = \tan 18^\circ + 2 \tan 54^\circ$ (ii) $\cos 5x = 16 \cos^5 x - 20 \cos^3 x + 5 \cos x$
- 5) Prove that: (i) $\frac{\sin 5x - 2 \sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$ (ii) $\sin x \sin(60 - x) \sin(60 + x) = \frac{1}{4} \sin 3x$
- 6) Prove that: if A, B, C are in A.P. prove $\cot B = \frac{\sin A - \sin C}{\cos C - \cos A}$
- 7) Find the principal solution of the following: (i) $\cos x = \frac{1}{2}$ (ii) $\sin x = \frac{-1}{2}$ (iii) $\cot x = -\sqrt{3}$
(iv) $\tan x = \frac{1}{\sqrt{3}}$ (v) $\sec x = -\sqrt{2}$ (vi) $\operatorname{cosec} x = -\frac{2}{\sqrt{3}}$ (vii) $\cos x = -\frac{\sqrt{3}}{2}$ (viii) $\cot x = -1$
- 8) Solve the following trigonometric equations:
(i) $\sin^2 x + 3 \cos x = 0$ (ii) $\cos x - \cos 2x + \cos 3x - \cos 4x = 0$ (iii) $\sin x \tan x - 1 = \tan x - \sin x$
(iv) $2 \cos^2 x + \cos^2 2x = 2$ (v) $2 \tan x - \cot x = -1$ (vi) $\cos 3x = \sin 2x$
- 9) If $\cot x = \frac{3}{4}$ and x lies in the 3rd quadrant, find the values of $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$.
- 10) Prove that, $\sqrt{2 + \sqrt{2 + 2 \sin(90 - 4x)}} = 2 \cos x$
- 11) Evaluate: $\cos \frac{7\pi}{12} \cos \frac{\pi}{4} - \sin \frac{7\pi}{12} \sin \frac{\pi}{4}$
- 12) Convert $45^\circ 21'$ and $7^\circ 37' 30''$ into radian measure.
- 13). Find the values of the following: (i) $\sin \frac{19\pi}{3}$ (ii) $\tan \frac{-11\pi}{3}$ (iii) $\tan \frac{-15\pi}{4}$
(iv) $\sec \frac{-19\pi}{3}$ (v) $\cos(-330^\circ)$

14. Solve $4 \sin^2 x - 8 \cos x + 1 = 0$.

15. Prove that $\sin 3x + \sin 2x - \sin x = 4 \sin x \cos \frac{x}{2} \cos \frac{3x}{2}$.

16) Find the general solutions of $3 \sin^2 x + 2\sqrt{3} \sin x \cos x - 3 \cos^2 x = 0$

17) Find the value of $2 \sin^2 \frac{\pi}{6} + \operatorname{Cosec}^2 \frac{7\pi}{6} \cos^2 \frac{\pi}{3}$

MATHEMATICAL INDUCTION

1) By P.M.I, prove that:

$$\frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + \dots + n \text{ terms} = \frac{n}{6n+4}$$

2) Prove that $2 \cdot 7^n + 3 \cdot 5^n - 5$ is divisible by 24, for all $n \in \mathbb{N}$.

3) $1^3 + 2^3 + 3^3 + \dots + n^3 = \left(\frac{n^2 (n+1)^2}{4} \right)$

4) $1 + \frac{1}{1+2} + \frac{1}{1+2+3} + \dots + \frac{1}{1+2+3+\dots+n} = \frac{2n}{n+1}$

5) $x^n - y^n$ is divisible by $x + y$. 6) $12^n + 2 \cdot 5^{n-1}$ is divisible by 7.

7) $(2n + 7) < (n + 3)^2$. 8) $1 + 2 + 3 + \dots + n > \frac{(2n+1)^2}{8}$

9). Prove the following by using the principle of mathematical induction for all $n \in \mathbb{N}$.

$$1 \cdot 3 + 2 \cdot 3^2 + 3 \cdot 3^3 + \dots + n \cdot 3^n = \frac{(2n-1)3^{n+1} + 3}{4}$$

10) $(1 + \frac{3}{1})(1 + \frac{5}{4})(1 + \frac{7}{9}) \dots (1 + \frac{2n+1}{n^2}) = (n + 1)^2$

11. Prove that $2 \cdot 7^n + 3 \cdot 5^n - 5$ is divisible by 24, for all $n \in \mathbb{N}$.

COMPLEX NUMBERS & QUADRATIC EQUATIONS

1) Find the magnitude of the number $\left(\frac{1+\cos x+i \sin x}{1+\cos x-i \sin x}\right)$

3) Write the complex number $\frac{5-i}{2-3i}$ in the polar form.

4) Find the square roots of each of the following:

(i) $-16 - 30i$ (ii) $12 - 5i$ (iii) $-7 + 24i$ (iv) $-2 - 2\sqrt{3}i$ (v) $8 - 5i$ (vi) $\frac{2+3i}{5-4i} + \frac{2-3i}{5+4i}$

5) Find the modulus and the argument of the following complex numbers; hence express them in polar form.

(i) $4\sqrt{3} + 4i$ (ii) $\frac{1+2i}{1-(1-i)^2}$ (iii) $\frac{5}{2}(\cos 30^\circ + i \sin 30^\circ)$ (iv) $-\sqrt{3} - i$ (v) $\frac{1+3i}{1-2i}$

6) Solve the following equations.

(i) $3x^2 - 7x + 5 = 0$ (ii) $ix^2 - 4x - 4i = 0$ (iii) $x^2 + 20ix + 21 = 0$

(iv) $x^2 - (3\sqrt{2} + 2i) + 6\sqrt{2}i = 0$ (v) $2x^2 + ix^2 - 2i = (5 - i)x - 2$

7) For what value of θ , $\frac{3+2i \sin \theta}{1-2i \sin \theta}$ is purely real & purely imaginary.

8) For complex number z, z_1, z_2 , prove each of the following:

(i) $\overline{z_1 + z_2} = \overline{z_1} + \overline{z_2}$ (ii) $\overline{z_1 z_2} = \overline{z_1} \cdot \overline{z_2}$ (iii) $z \cdot \overline{z} = |z|^2$ (iv) $z + \overline{z} = 2\operatorname{Re}(z)$

9) Find real values of x and y , if $\frac{x-1}{3+i} + \frac{y-1}{3-i} = i$

10). Write the complex number $\frac{(1+i)(1+i\sqrt{3})}{1-i}$ in the trigonometrical form

LINEAR INEQUALITIES

1) A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 litres of 8% solution, how many litres of the 2% solution will have to be added?

2) Solve the system of inequalities: $\frac{x+3}{x-2} \leq 2$, $\frac{2x+5}{x+7} \geq 3$.

3) Solve graphically: $x + y \leq 4$; $3x + y \geq 4$; $x + 5y \geq 4$; $x \leq 3$; $y \leq 3$, $x \geq 0$, $y \geq 0$

- 4) Solve graphically, $3x - 4y + 12 \geq 0$, $2x - y + 2 \geq 0$, $2x + 3y - 1 \geq 0$, $x \geq 2$, $x, y \geq 0$
- 5) Solve graphically: $x + y \geq 1$, $7x + 9y \leq 63$, $x \leq 6$, $y \leq 5$, $x, y \geq 0$

Sets , Relations and Functions

- 1) If $A = \{x : x = 2n + 1, n \leq 6, n \in N\}$, $B = \{x : x = 3n - 2, n \leq 3, n \in N\}$, then prove that $(A \cup B)' = A' \cap B'$ and $(A \cap B)' = A' \cup B'$
- 2) Let A and B be sets .If $A \cap X = B \cap X = \emptyset$ and $A \cup X = B \cup X$ for some set X, show that $A = B$.
- 3) In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% buy A and B, 3% buy B and C, 4% buy A and C. If 2% buy all three, find the number of families which buy (i) A only (ii) B only (iii) none of three.
- 4) In a class of 60 students, 23 play Hockey, 15 play Basketball and 20 play Cricket. 7 play Hockey and Basketball, 5 play Cricket and Basketball, 4 play Hockey and Cricket and 15 do not play any of these games. Find: (i) How many play all three games? (ii) How many play Hockey but not Cricket? (iii) How many play Hockey and Cricket but not Basketball?
- 5) Let A, B and C be three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, show that $B = C$.
- 6) Find domain and range of the real function $f(x)$ defined by $f(x) = \begin{cases} 1 - 2x, & x < 0 \\ 1, & x = 0 \\ 2x + 1, & x > 0 \end{cases}$ and draw its graph.
- 7) Find the domain and range of the following functions:
- (i) $2 \sin 2x$ (ii) $\frac{1}{\sqrt{x-4}}$ (iii) $\sqrt{x^2 - 6x + 8}$ (iv) $\frac{x+3}{|x+4|}$ (v) $\sqrt{9 - x^2}$
- 8) If $A = \{1, 7\}$, $B = \{1, 7, 3\}$, $C = \{1, 5, 8\}$, $D = \{2, 4, 8\}$, then verify that:
- (i) $(A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)$ (ii) $(A \times B) \cup (C \times D) \subseteq (A \cup C) \times (B \cup D)$
- 9) Let set A and B be two sets such that $A \times B$ consists 6 elements. If three elements are (1, 4), (2, 6), (3, 6), find $A \times B$ and $B \times A$.
- 10) If $P = \{-2, 1\}$, find $P \times P \times P$.

11) In a group of 50 people, 30 like to play cricket, 25 like to play football and 32 like to play hockey. Assume that each one likes to play at least one of the three games. If 15 play cricket & football, 11 football & hockey, 18 cricket & hockey, then

(i) How many like all three games?

(ii) How many like only football?

(iii) How many like only hockey?

12) Show that: $(A \cup B) - (A \cap B) = (A - B) \cup (B - A)$

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

14) If $U = \{1,2,3,4,5,6,7,8,9\}$, $A = \{2,4,6,8\}$ and $B = \{2,3,5,7\}$, verify that:

$$(A \cup B)^c = A^c \cap B^c \quad \text{and} \quad (A \cap B)^c = A^c \cup B^c$$

15) A class has 175 students. The following is the description showing the number of students studying one or more of the following subjects in the class. Mathematics 100, Physics 70, Chemistry 46, Maths & Physics 30, Maths & Chemistry 28, Physics & Chemistry 23, all three subjects 18. Find: (i) The number of students who have not offered any of these three subjects. (ii) The number of students who enrolled in Mathematics alone, Physics alone and Chemistry alone.

16) Let $A = \{1,2,4\}$, $B = \{3,5,7\}$ and $C = \{5,7,9\}$, verify that: $A \times (B \cap C) = (A \times B) \cap (A \times C)$

17) In a school, out of 100 students, 15 like reading newspapers only, 12 like learning computers only and 8 like watching movies on TV in the spare time, 40 like reading newspapers and watching movies, 20 like learning computers and watching movies, 10 like reading newspapers and learning computer, 65 like watching movies on TV. Draw a Venn diagram; hence evaluate the number of students who (a) like reading newspapers, (b) like learning computers, (c) Don't like any of three activities. Which value do you get from above information?

18. If $U = \{x; x \text{ is a natural no less than } 11\}$, $A = \{x; x \text{ is first five odd nos.}\}$, $B = \{x; x \text{ is first five multiple of } 2\}$ and $C = \{x; x \text{ is a natural no less than } 5\}$ then

(i) What is U' ?

(iii) what is $A \cap (B - C)$?

(ii) What is $A - (B \cap C)$?

(iv) what is $A' \cup (B' \cap C')$?

19. Let $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$ be a linear function from Z into Z . Find $f(x)$.

20. Out of 100 students, 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English and Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three. Find how many passed

(i) in English and Mathematics but not in Science.

(ii) in Mathematics and Science but not in English.

(iii) In Mathematics only. (iv) in more than one subject only. As a student how can you help in the development of the society ?
