



SMART TEST SERIES

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Chemistry-11	Date:		Time:	
Questions Type	Type 8 - Short Test (No Choice) - Marks=30				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(6x1=6)

- Which one is not example of a sublimate?
(A) Ammonium chloride (B) Iodine (C) NaCl (D) Benzoic acid
- Compound which undergo sublimation is:
(A) $KMnO_4$ (B) $CaCO_3$ (C) NH_4Cl (D) Na_2CO_3
- Solvent extraction is an equilibrium process and is Controlled by:
(A) Law of mass action (B) The amount of solvent used (C) Distribution law
(D) The amount of Solute
- A component having small value of K (distribution coefficient) mostly remains in the:
(A) Stationary phase (B) Mobile phase (C) Chromatographic tank (D) Solvent
- The comparative rates at which the solutes move in paper chromatography, depends on:
(A) The size of paper used (B) Their R_f values solutes (C) Temp of the experiment
(D) Size of the chromatographic tank
- During chromatography strip should be dipped into solvent mixture to a depth of:
(A) 3-4 mm (B) 4-5 mm (C) 5-6 mm (D) 6-7 mm

Q.2 Write short answers of the following questions.

(8x2=16)

- What is sublimation? Give examples of substances which show sublimation.
- Define sublimate. Give two examples.
- Define Sublimation and Chromatography.
- Define distribution law in solvent extraction.
- Write down two applications of chromatography.
- What is partition chromatography.
- Differentiate between stationary and mobile phase used in chromatography.
- What is R_f value? Why it has no units?

NOTE: Attempt the long question.

(4+4=8)

- A water insoluble organic compound aspirin is prepared by the reaction of salicylic acid with a mixture of acetic acid and acetic anhydride. How will you separate the product from the reaction mixture?
- You have provided with a mixture containing three inks with different colours. Write down the procedure to separate the mixture with the help of paper chromatography.

MCQs Ans Key.

Q:1 (C)

Q:2 (C)

Q:3 (C)

Q:4 (A)

Q:5 (B)

Q:6 (C)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Chemistry-11	Date:		Time:	
Questions Type	Type 10 - Short Test - Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(9x1=9)

- Which one is not example of a sublimate?
(A) Ammonium chloride (B) Iodine (C) NaCl (D) Benzoic acid
- Compound which undergo sublimation is:
(A) $KMnO_4$ (B) $CaCO_3$ (C) NH_4Cl (D) Na_2CO_3
- Solvent extraction is an equilibrium process and is Controlled by:
(A) Law of mass action (B) The amount of solvent used (C) Distribution law
(D) The amount of Solute
- Solvent extraction method is particularly useful technique for separation when the product to be separated is:
(A) Non-volatile or thermally unstable (B) Volatile or thermally stable
(C) Non-volatile or thermally stable (D) Volatile or thermally unstable
- A component having small value of K (distribution coefficient) mostly remains in the:
(A) Stationary phase (B) Mobile phase (C) Chromatographic tank (D) Solvent
- Chromatography in which the stationary phase is a solid is classified as:
(A) Partition chromatography (B) Gas Chromatography (C) Adsorption Chromatography
(D) Thin layer Chromatography
- The comparative rates at which the solutes move in paper chromatography, depends on:
(A) The size of paper used (B) Their R_f values solutes (C) Temp of the experiment
(D) Size of the chromatographic tank
- During paper chromatography, the stationary phase is:
(A) Solid (B) Liquid (C) Gas (D) Plasma
- During chromatography strip should be dipped into solvent mixture to a depth of:
(A) 3-4 mm (B) 4-5 mm (C) 5-6 mm (D) 6-7 mm

Q.2 Write short answers to any (5) of the following questions.

(5x2=10)

- Define sublimation what type of a substance can be purified by this technique.
- Define sublimate. Give two examples.
- Define Sublimation and Chromatography.
- Define partition law.
- Define chromatography. Give formula of distribution coefficient.
- Differentiate between stationary and mobile phase used in chromatography.
- Write down the uses of chromatography.
- What is R_f value? Why it has no units?

NOTE: Attempt any Two (2) questions.

(8x2=16)

- You have provided with a mixture containing three inks with different colours. Write down the procedure to separate the mixture with the help of paper chromatography.
- A solid organic compound is soluble in water as well as in chloroform. During its preparation, it remains in aqueous layer. Describe a method to obtain it from this layer.
- A water insoluble organic compound aspirin is prepared by the reaction of salicylic acid with a mixture of acetic acid and acetic anhydride. How will you separate the product from the reaction mixture?

MCQs Ans Key.

Q:1 (C)

Q:2 (C)

Q:3 (C)

Q:4 (D)

Q:5 (A)

Q:6 (C)

Q:7 (B)

Q:8 (B)

Q:9 (C)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Biology-11	Date:		Time:	
Questions Type	Type 9 - Short Test (No Choice) - Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(9x1=9)

- 1 The potential source of chemical energy for cellular activities:
(A) C-H bond (B) C-N bond (C) C-O Bond (D) C-C bond
- 2 Human tissue contains about 20% water in:
(A) brain cells (B) bone cells (C) kidney (D) skin cells
- 3 Monosaccharide which are rare in nature and occur in some bacteria:
(A) Trioses (B) Tetroses (C) Pentoses (D) Hexoses
- 4 The most abundant carbohydrates in nature is:
(A) Starch (B) Glycogen (C) Cellulose (D) Sugar
- 5 The most abundant organic compound in mammalian cell:
(A) Water (B) Proteins (C) Carbohydrates (D) Lipids
- 6 Haemoglobin is a:
(A) Fibrous proteins (B) Coiled proteins (C) Globular proteins (D) Double coiled proteins
- 7 The mRNA of the total cell RNA is about:
(A) 3-4% (B) 1-2% (C) 2-4% (D) 3-5%
- 8 The percentage of ribosomal RNA in the cell is:
(A) 4% (B) 20% (C) 50% (D) 80%
- 9 Conjugated histone proteins are:
(A) Structural and Regulatory (B) Structural Only (C) Regulatory only (D) Transport proteins

Q.2 Write short answers of the following questions.

(5x2=10)

- (i) What is heat capacity of water ? Give its importance.
- (ii) Why Glycogen is called animal starch?
- (iii) How the peptide bonds are formed?
- (iv) What is the function of ribosomal RNA?
- (v) What is phosphodiester linkage? Sketch.

NOTE: Attempt the following questions.

(8x2=16)

- 3(a) Describe the importance of water of life.
- (b) Give the Biological importance of water.
- 4(a) What are phospholipids?
- (b) Describe primary and secondary structure of protein.

MCQs Ans Key.

Q:1 (A)

Q:2 (A)

Q:3 (B)

Q:4 (C)

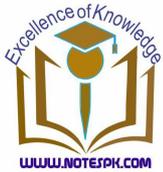
Q:5 (B)

Q:6 (C)

Q:7 (A)

Q:8 (D)

Q:9 (A)



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Subject:	Biology-11	Date:		Time:	
Questions Type	Type 10 - Short Test - Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(9x1=9)

- 1 The percentage of water in bacterial cell is about:
(A) 15% (B) 18% (C) 50% (D) 70%
- 2 Human tissue contains about 20% water in:
(A) brain cells (B) bone cells (C) kidney (D) skin cells
- 3 In free state, glucose is present in:
(A) Dates (B) Amylose (C) Glycogen (D) Cellulose
- 4 Glycogen is found abundantly in:
(A) Liver (B) Muscles (C) Kidney (D) Both A & B
- 5 Cotton is apure:
(A) Cellulose (B) Polysaccharide (C) Cellulase (D) Both A & B
- 6 The most abundant carbohydrates in nature is:
(A) Starch (B) Glycogen (C) Cellulose (D) Sugar
- 7 Percentage of carbohydrates in mammalian cell is:
(A) 1% (B) 2% (C) 3% (D) 4%
- 8 The melting point of palmatic acid is:
(A) $-8^{\circ}C$ (B) $34^{\circ}C$ (C) $63.1^{\circ}C$ (D) $55.6^{\circ}C$
- 9 The mRNA of the total cell RNA is about:
(A) 3-4% (B) 1-2% (C) 2-4% (D) 3-5%

Q.2 Write short answers of the following questions.

(5x2=10)

- (i) What is Biochemistry? Give its importance.
- (ii) What is heat capacity of water ? Give its importance.
- (iii) What are oligosaccharides?
- (iv) What are lipids? Give two roles of waxes.
- (v) Differentiate between saturate d and unsaturated fatty acid.
- (vi) Differentiate between Fats and Oils.
- (vii) What are lipids? Write its importance.
- (viii) What is the function of ribosomal RNA?

NOTE: Attempt any Two (2) questions.

(8x2=16)

- 3(a) Explain polysaccharides with examples.
- (b) Write a note primary structure of protein.
- 4(a) Write a note on acylglycerols.
- (b) Write down any eight functions of proteins.
- 5(a) Discuss the importance of water in life.
- (b) Discuss Watson & Crick model of DNA.

MCQs Ans Key.

Q:1 (D)

Q:2 (A)

Q:3 (A)

Q:4 (D)

Q:5 (D)

Q:6 (C)

Q:7 (D)

Q:8 (C)

Q:9 (A)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Physics-11	Date:		Time:	
Questions Type	Type 9 - Short Test (No Choice) - Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(7x1=7)

- The magnitude of a vector $\vec{r} = 3\hat{i} + 2\hat{j} + 6\hat{k}$ is:
(A) -1 (B) -7 (C) 7 (D) 8
- If a vector \vec{A} makes an angle 0° with x-axis then its x-component is:
(A) $A \cos \theta$ (B) A^2 (C) A (D) $A \sin \theta$
- Name the quantity which is vector
(A) density (B) power (C) velocity (D) charge
- If a vector A makes an angle θ with x-axis, its x-component is given by;
(A) $A \sin \theta$ (B) $A \tan \theta$ (C) $A \cos \theta$ (D) $A \cos 2\theta$
- If two non zero vectors \vec{A} and \vec{B} are parallel to each other than:
(A) $\vec{A} \cdot \vec{B} = 0$ (B) $\vec{A} \cdot \vec{B} = AB$ (C) $|\vec{A} \times \vec{B}| = AB$ (D) $(\vec{A} \times \vec{B}) = \vec{A} \cdot \vec{B}$
- If $\vec{A} = -4\hat{i}$ and $\vec{B} = 6\hat{j}$ then $\vec{A} \cdot \vec{B}$ will be:
(A) $24\hat{k}$ (B) 24 (C) zero (D) $-24\hat{k}$
- The cross product of two anti-parallel vectors is:
(A) 0 (B) 1 (C) Maximum (D) Negative
- The moment of force is called:
(A) torque (B) moment arm (C) couple (D) none of the above

Q.2 Write short answers of the following questions.

(5x2=10)

- The vector sum of three vectors gives a zero resultant. What can be orientation of the vectors?
- Define the multiplication of a vector by a scalar.
- Define unit vector and position vector.
- What is the orientation of when R_x and R_y have opposite sign?
- Give two factors on which turning effect depends.

NOTE: Attempt the following questions.

(9x2=18)

- Define rectangular components of a vector. Discuss the vector addition of number of coplanar vectors by rectangular component method.
- A certain corner of a room is selected as the origin of a rectangular coordinate system. If an insect is sitting on an adjacent wall at a point having coordinates (2,1), where the units are in metres, what is the distance of the insect from this corner of the room?
- Define rectangular components of a vector. Find resultant of two vectors by their rectangular components.
- Given that $\vec{A} = 2\hat{i} + 3\hat{j}$ and $\vec{B} = 3\hat{i} + 4\hat{j}$. Find the magnitude and angle of $\vec{C} = \vec{A} + \vec{B}$.

MCQs Ans Key.

Q:1 (C)

Q:2 (C)

Q:3 (D)

Q:4 (C)

Q:5 (B)

Q:6 (C)

Q:7 (A)

Q:8 (A)



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Subject:	Physics-11	Date:		Time:	
Questions Type	Type 10 - Short Test - Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(7x1=7)

- A scalar is a physical quantity which is completely specified by:
(A) a number (B) a direction only (C) a number with proper units (D) a number with direction
- The resultant of 120 N and 20 N forces can not be:
(A) 141 N (B) 100 N (C) 101 N (D) 130 N
- The sum of two perpendicular forces 8 N and 6 N is:
(A) 2 N (B) 14 N (C) 10 N (D) -2 N
- If R_x is negative and R_y is positive and resultant lies in quadrant:
(A) 1st (B) 2nd (C) 3rd (D) 4th
- The vector product $(\vec{A} \times \vec{A})$ is:
(A) 0 (B) 1 (C) A^2 (D) Zero
- $AB\sin\theta \hat{n} \times AB\sin\theta \hat{n}$ is:
(A) $A^2B^2\sin^2\theta$ (B) A^2B^2 (C) $A^2B^2\hat{n}$ (D) 0
- If the magnitudes of scalar and vector product of two vectors are $2\sqrt{3}$ and 2 respectively. The angle between vectors is:
(A) 30° (B) 60° (C) 120° (D) 180°

Q.2 Write short answers to any (5) of the following questions.

(5x2=10)

- How would the two vectors of same magnitude be oriented such that resultant vector has magnitude equal to each vector.
- Define position vector and resultant vector?
- If $\vec{A} = -4\hat{i} - 4\hat{j}$, what is the orientation of \vec{A} ?
- Name three conditions that could make $\vec{A} \cdot \vec{B} = 0$.
- Prove that dot product is commutative.
- If $\vec{A} = \hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{B} = 2\hat{i} - \hat{j} + \hat{k}$, then find $\vec{A} \cdot \vec{B}$.
- Mention the criterion for positive and negative torque.
- Give two factors on which turning effect depends.

NOTE: Attempt any Two (2) questions.

(9x2=18)

- 3(a) Define torque calculate torque due to force acting on a rigid body.

(b) The magnitude of dot and cross products of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between the vectors.
- 4(a) Define and explain the vector product or cross product of two vectors with an example.

(b) Find the angle between two vectors: $\vec{A} = 5\hat{i} + \hat{j}$ and $\vec{B} = 2\hat{i} + 4\hat{j}$.
- 5(a) Explain the addition of vectors by rectangular components. Also write down the main steps for addition.

(b) A certain corner of a room is selected as the origin of a rectangular coordinate system. If an insect is sitting on an adjacent wall at a point having coordinates (2,1), where the units are in metres, what is the distance of the insect from this corner of the room?

MCQs Ans Key.

Q:1 (C)

Q:2 (A)

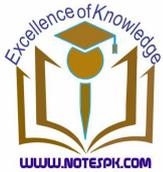
Q:3 (C)

Q:4 (B)

Q:5 (D)

Q:6 (D)

Q:7 (A)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Questions Type	Type 9 - Short Test (No Choice)- Marks=35				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers.

(5x1=5)

- A set B is a ----- of set A if every element of B is also an element of A.**
(A) Power set (B) super set (C) sub set (D) None
- A set is defined as:**
(A) Collection of same objects. (B) Well defined collection of same objects.
(C) Well defined collection of distinct objects. (D) None of these.
- If $A = \{a, b\}$, then the power set of A is:**
(A) $\{a^b, b^a\}$ (B) $\{a^2, b^2\}$ (C) $\{\emptyset, \{a\}, \{b\}\}$ (D) $\{\emptyset, \{a\}, \{b\}, \{a, b\}\}$
- For any two sets A and B $(A \cap B)^c$ is equal to:**
(A) A^c (B) B^c (C) $A^c \cap B^c$ (D) $A \cap B$
- If A has 3 elements and B has 6 elements, then minimum number of elements in $A \cup B$ is:**
(A) 3 (B) 6 (C) 9 (D) 18

Q.2 Write short answers of the following questions.

(5x2=10)

- Write each of the following sets in the descriptive and tabular forms: $\{x | x \in O \wedge 5 \leq x \leq 7\}$
- Which pairs of sets are equivalent? Which of them are also equal? $\{a, b, c\}, \{1, 2, 3\}$
- Show that each of the following statements is a tautology: $p \rightarrow (p \vee q)$
- Show that each of the following statements is a tautology: $\sim (p \rightarrow q) \rightarrow p$
- Show that each of the following statements is a tautology: $\sim q \wedge (p \rightarrow q) \rightarrow \sim p$

NOTE: Attempt the following questions.

(10x2=20)

- Show that the set $\{1, \omega, \omega^2\}$ where $\omega^3 = 1$, is an Abelian group w.r.t ordinary Multiplication.
 - Convert the following theorem to logical form and prove it by constructing truth table: $(A \cap B)' = A' \cup B'$
- 4(a) From suitable properties of union and intersection deduce the following results: $A \cup (A \cap B) = A \cap (A \cup B)$
- (b) Convert the following theorem to logical form and prove it by constructing truth table:
 $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

MCQs Ans Key.

Q:1 (C)

Q:2 (C)

Q:3 (D)

Q:4 (C)

Q:5 (B)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Questions Type	Type 3 - MCQs + SQs Test - Marks=30				
Test Syllabus:	Unit-2,				

O Four possible answers A, B, C & D to each question are given. Circle the correct one. (10x1=10)

- Let A be the set of squares of natural numbers and let $x \in A, y \in A$ then:
(A) $x + y \in A$ (B) $x - y \in A$ (C) $x/y \in A$ (D) $xy \in A$
- If $A \subseteq B$ then complements of A in B is:
(A) $A - B$ (B) $B - A$ (C) $A \cap B$ (D) $A \cup B$
- If $A \subseteq B$, then the complement of A in B is:
(A) $A - B$ (B) $B - A$ (C) $A \cap B$ (D) $A \cup B$
- $(F')' = ?$
(A) \emptyset (B) U (C) F (D) None
- For a set A and the universal set $U, A \cap A^c =$
(A) A (B) A^c (C) ϕ (D) U
- If $p \rightarrow q$ be a given conditional, then its inverse is:
(A) $\sim p \rightarrow \sim q$ (B) $q \rightarrow p$ (C) $\sim q \rightarrow \sim p$ (D) $p \rightarrow \neg q$
- $\{3^n : n \in \mathbb{Z}\}$ is an abelian group under:
(A) addition (B) subtraction (C) multiplication (D) division
- $\{3n : n \in \mathbb{Z}\}$ is an abelian group under:
(A) addition (B) subtraction (C) multiplication (D) division
- The set of natural numbers \mathbb{N} has identity element 1 w.r.t -----
(A) " \times " (B) " $+$ " (C) " $-$ " (D) None of the above
- If F and G be subsets of set U , such that $F \cup G = U$ then F and G are called ----- sets.
(A) Overlapping (B) Disjoint (C) Exhaustive (D) None

Q.2 Write short answer of the following questions. (10x2=20)

- If $B = \{1, 2, 3\}$, then find power set.
- Write each of the following sets in the descriptive and tabular forms: $\{x \mid x \in \mathcal{O} \wedge 3 < x < 12\}$
- What is the number of elements of the power set of each of the following sets? $\{\{a, b\}, \{b, c\}, \{d, e\}\}$
- Which pairs of sets are equivalent? Which of them are also equal? $\{5, 10, 15, 20, \dots, 55555\}, \{5, 10, 15, 20, \dots\}$
- Define the union of two sets.
- Define the intersection of two sets.
- What are the complementation laws?
- Show that each of the following statements is a tautology: $\sim(p \rightarrow q) \rightarrow p$
- For $A = \{1, 2, 3, 4\}$, find the following relation in A . State the domain and range of each relation. Also draw the graph.
 $\{(x, y) \mid y + x < 5\}$
- Subtraction is non-commulative and non-associative on \mathbb{N} .

Q.2 Write short answer of the following questions. (10x2=20)

- Define a set.
- Write the following sets in set builder notation: The set of all real numbers between 1 and 2
- Write down the power set of each of the following sets: $\{+, -, \times, \div\}$
- Which pairs of sets are equivalent? Which of them are also equal? $\{a, b, c\}, \{1, 2, 3\}$
- Which pairs of sets are equivalent? Which of them are also equal? $\{1, 2, 3, 4, \dots\}, \{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots\}$
- What are disjoint sets?
- What are the absorption laws?
- Exhibit $A \cup B$ and $A \cap B$ by Venn diagrams in the following cases: A and B are overlapping sets

- (ix) Verify $A \cap B = B \cap A$ for sets $A=Z$ and $B=Q$.
(x) Show that each of the following statements is a tautology: $\sim q \wedge (p \rightarrow q) \rightarrow \sim p$

Q.2 Write short answer of the following questions.

(10x2=20)

- (i) If $A=\{1\}$, what is $P(A)$?
(ii) Write each of the following sets in the descriptive and tabular forms: $\{x|x \in N \wedge x \leq 10\}$
(iii) What are overlapping sets?
(iv) From suitable properties of union and intersection deduce $A \cup (A \cap B) = A \cap (A \cup B)$.
(v) What is deduction?
(vi) Show that each of the following statements is a tautology: $p \rightarrow (p \vee q)$
(vii) Convert $(A \cap B)' = A' \cup B'$ into logical form.
(viii) If $A=\{1,2,3,4\}$ then write the relation in A for $\{(x,y)/x+y=5\}$.
(ix) If G is a group under the operation * and $a, b \in G$, find the solution of the equation $a * x = b$.
(x) Show that the set $\{1, \omega, \omega^2\}$, when $\omega^3 = 1$, is an Abelian group w.r.t. ordinary multiplication.

MCQs Ans Key.

Q:1 (D)

Q:2 (B)

Q:3 (B)

Q:4 (C)

Q:5 (C)

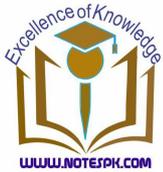
Q:6 (A)

Q:7 (C)

Q:8 (A)

Q:9 (A)

Q:10 (C)



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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Questions Type	Type 4 - SQs+LQs Test - Marks=80				
Test Syllabus:	Unit-2,				

Q.1 Write short answers to ALL of the following questions.

(15x2=30)

- (i) Define equivalent sets.
- (ii) Define the power set of a set.
- (iii) Define a set.
- (iv) What is the number of elements of the power set of each of the following sets? $\{0,1\}$
- (v) What is the number of elements of the power set of each of the following sets? $\{a,b\}, \{b,c\}, \{d,e\}$
- (vi) Differentiate between equal and equivalent sets.
- (vii) Exhibit $A \cup B$ and $A \cap B$ by Venn diagrams in the following cases: $A \cup A'$
- (viii) Let $A = \{2, 4, 6, 8, 10\}$, $B = \{1, 2, 3, 4, 5\}$ find $A \cup B$.
- (ix) Verify De Morgan's laws for the following sets: $U = \{1, 2, 3, \dots, 20\}$, $A = \{2, 4, 6, \dots, 20\}$, $B = \{1, 3, 5, \dots, 19\}$
- (x) Define the implication or conditional.
- (xi) Define inductive and deductive logic.
- (xii) Determine whether each of the following is a tautology, a contingency or an absurdity: $p \wedge \sim p$
- (xiii) If $A = \{1, 2, 3, 4\}$ then write the relation in A for $\{(x, y) / x + y = 5\}$.
- (xiv) Subtraction is non-commutative and non-associative on N.
- (xv) Show that the set $\{1, \omega, \omega^2\}$, when $\omega^3 = 1$, is an Abelian group w.r.t. ordinary multiplication.

Q.2 Write detail answers to ALL of the following questions.

(10x5=50)

- 1 Verify De Morgan's Laws for the following sets: $U = \{1, 2, 3, \dots, 20\}$, $A = \{2, 4, 6, \dots, 20\}$ and $B = \{1, 3, 5, \dots, 19\}$
- 2 Taking any set, say $A = \{1, 2, 3, 4, 5\}$ verify the following: $A \cup A = A$
- 3 If $U = \{1, 2, 3, \dots, 20\}$ and $A = \{1, 3, 5, \dots, 19\}$, verify the following: $A \cap U = A$
- 4 From suitable properties of union and intersection deduce the following results: $A \cup (A \cap B) = A \cap (A \cup B)$
- 5 Convert the following theorem to logical form and prove it by constructing truth table: $(A \cap B)' = A' \cup B'$
- 6 Convert the following theorem to logical form and prove it by constructing truth table:
 $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- 7 Find the inverse of each of the following relations. Tell whether each relation and its inverse is a function or not.
 $\{(1, 3), (2, 5), (3, 7), (4, 9), (5, 11)\}$
- 8 Find the inverse of each of the following relations. Tell whether each relation and its inverse is a function or not.
 $\{(x, y) | y^2 = 4ax, x \geq 0\}$
- 9 Find the inverse of each of the following relations. Tell whether each relation and its inverse is a function or not.
 $\{(x, y) | x^2 + y^2 = 9, |x| \leq 3, |y| \leq 3\}$
- 10 Show that the set $\{1, \omega, \omega^2\}$ where $\omega^3 = 1$, is an Abelian group w.r.t ordinary Multiplication.