TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-1,				

Q.1 Circle the correct answer. **(11x1=11)**

i. The additive identity of real numbers is:
(A) 0 (B) 1 (C) 2 (D) 3

ii. π, e are :
(A) integers (B) natural numbers (C) rational numbers (D) irrational numbers

iii. The set of all rational numbers between 2 , 3 is:
(A) an empty set (B) an infinite set (C) a finite set (D) a power set

iv. **If x is a positive real number, then the least value of** $x + \frac{1}{x}$ **is:**
(A) 2 (B) -2 (C) 0 (D) 1

v. **p , e are:**
(A) integers (B) natural numbers (C) rational numbers (D) irrational numbers

vi. If a, b Î R and a < b, then:
(A) $\frac{b}{a} < \frac{a}{b}$ (B) $\frac{1}{a} < \frac{1}{b}$ (C) $\frac{1}{a} > \frac{1}{b}$ (D) None of these

vii. **If x, y Î R and x y = 0, then:**
(A) x = 0 (B) y = 0 (C) x = 0 and y = 0 (D) x = 0 or y = 0

viii. The property $\forall a, b \in R,\ a = b \Rightarrow b = a$ is called:
(A) Commutative (B) Transitive (C) Symmetric (D) Reflexive

ix. $z_1 z_2 =$
(A) $\bar{z}_1 + \bar{z}_2$ (B) $\bar{z}_1 \bar{z}_2$ (C) $\bar{z}_1 z_2$ (D) $z_1 \bar{z}_2$

x. -i in polar form can be written as:
(A) $\cos\frac{\pi}{2} - i\sin\frac{\pi}{2}$ (B) $\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}$ (C) $\cos\pi + i\sin\pi$ (D) none

xi. Conjugate of $-3 - 2i$ is:
(A) $3 + 2i$ (B) $-3 + 2i$ (C) $3 + 2i$ (D) None of the above

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Simplify the following: $(-\frac{1}{2} - \frac{\sqrt{3}}{2}i)^3$

(ii) Name the properties used in the following equations: $a(b + c - d) = ab + ac - ad$

(iii) Define closure law and commutative law for multiplication. (iv) Factorize the following: $3x^2 + 3y^2$

(v) If $z_1 = 2 + i,\ z_2 = 3 - 2i,\ z_3 = 1 + 3i$ then express $\frac{z_1 z_3}{z_2}$ in the form $a + ib$

(vi) Show that $\forall z \in c\ z^2 + z^{-2}$ is a real number.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) State symmetric property of equality. (ii) Does {1} possess closure property w.r.t. addition and multiplication?

(iii) Find moduli of the following complex numbers: 3 (iv) Simplify $(5, -4) \div (-3, -8)$. (v) Simplify the following: i^9

(vi) Simplify $(-i)^{19}$.

NOTE: Attempt a long question. **(5+5=10)**

MCQs Ans Key

Q:1 (A)	Q:2 (D)	Q:3 (B)	Q:4 (A)	Q:5 (D)	Q:6 (D)
Q:7 (D)	Q:8 (D)	Q:9 (B)	Q:10 (A)	Q:11 (B)	

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-2,				

Q.1 Circle the correct answer. **(11x1=11)**

i. $\{\phi\}$ is equal to:
(A) Empty Set (B) Sigleton Set (C) Rational Set (D) Complex Set

ii. **If the number of elements in finite sets A and B are same, they are called ---------- .**
(A) Equal sets (B) Equivalent sets (C) Disjoint sets (D) Over lapping sets

iii. **Let A = {1,2,3,4,5,6} Then, incorrect statement is:**
(A) Æ Í A (B) A Í A (C) {1,3,9} Í A (D) {4} Í A

iv. If A={1,2,3,4,5}, B={4,5,6,7,8,9,10}, then A−B is equal to:
(A) {6,7,8,9,10} (B) {4,5} (C) {1,2,3} (D) {4,5,6,7,8,9,10}

v. If $A \subseteq B$, then $A \cup B$ is:
(A) A (B) B (C) ϕ (D) x

vi. **A set containing finite numbers of elements is called ----------.**
(A) Null set (B) Super set (C) Finite set (D) Infinite set

vii. **If A and B are any two sets, then:**
(A) A Ç B Í B (B) A Ç B ⊄ B (C) A Ç B Í B¢ (D) A Ç B ⊄ B¢

viii. **If q ® p be a given conditional, then its contrapositive is:**
(A) ~ p ® ~ q (B) q ® p (C) ~ q ® ~ p (D) p ® Ø q

ix. **If ~ p ® q be a given conditional, then its inverse is:**
(A) ~ p ® ~ q (B) q ® p (C) ~ q ® ~ p (D) p ® ~ q

x. Number of identity elements in any group is:
(A) 1 (B) 2 (C) 3 (D) None

xi. A group G is abelian if $b^{-1}a^{-1}$ = – – – – –
(A) 1 (B) a (C) b (D) e

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) What are overlapping sets?

(ii) Write each of the following sets in the descriptive and tabular forms: $\{x|x \in O \wedge 5 \leq x \leq 7\}$

(iii) Exhibit $A \cup B$ and $A \cap B$ by Venn diagrams in the following cases: $A \cup A'$ (iv) State the De.Morgan's Laws.

(v) What is induction? (vi) Show that each of the following statements is a tautology: $\sim q \wedge (p \rightarrow q) \rightarrow \sim p$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Write the following sets in set builder notation. $\{0, \pm 1, \pm 2, \ldots, \pm 1000\}$

(ii) For A={1,2,3,4}, find the following relation in A. State the domain and range of each relation. Also draw the graph.
$\{(x,y)|\, y + x > 5\}$

(iii) Which pairs of sets are equivalent? Which of them are also equal? $\{1,2,3,4,\ldots\}, \{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots\}$

(iv) Which pairs of sets are equivalent? Which of them are also equal? $\{5,10,15,20,\ldots,55555\}, \{5,10,15,20,\ldots\}$

(v) Use Venn diagrams to verity the following: $(A - B)^c \cap B = B$ (vi) Convert $(A \cap B)' = A' \cup B'$ into logical form.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Show that the set $\{1, \omega, \omega^2\}$ $\{1, \omega, \omega^2\}$ where $\omega^3 = 1$ $\omega^3 = 1$, is an Abelian group w.r.t ordinary Multiplication.

(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 (B)	Q:2 (B)	Q:3 (C)	Q:4 (C)	Q:5 (B)	Q:6 (C)
Q:7 (A)	Q:8 (A)	Q:9 (D)	Q:10 (C)	Q:11 (D)	

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Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-3,				

Q.1 Circle the correct answer. **(11x1=11)**

i. If each element of a matrix is zero, then it is called:
(A) Null matrix (B) Identity matrix (C) Scalar matrix (D) Diagonal matrix

ii. If A is singular matrix, then A^{-1} is equal to:
(A) $\frac{\text{adj } A}{A}$ (B) $\frac{|A|}{\text{adj } A}$ (C) $|A|\,\text{adj } A$ (D) does not exists

iii. $\begin{bmatrix} 1 & 2 \\ 3 & \end{bmatrix}$ is:
(A) a matrix of order 1×2 (B) a matrix of order 2×1 (C) not a matrix (D) a matrix of order 2×2

iv. If each element of a matrix is zero, then it is called:
(A) Hermitian (B) Symmetric (C) Null matrix (D) Skew symmetric

v. $[a \quad b \quad c]$ is a:
(A) zero matrix (B) diagonal matrix (C) column matrix (D) row matrix

vi. If $|A| = 0$, then A is:
(A) singular matrix (B) non-singular matrix (C) zero matrix (D) 0

vii. A square matrix $A = [a_{ij}]$ in which $a_{ij} = 0$ for all $i>j$ is called:
(A) Upper triangular (B) Lower triangular (C) Symmetric (D) Skew-symmetric

viii. If $A = \begin{bmatrix} 2 & 1 \\ 6 & 3 \end{bmatrix}$ then Cofactor of 6 is:
(A) +1 (B) -1 (C) -6 (D) 3

ix. A square matrix A is said to be Hermitian if $(A)^t$ = ____.
(A) A (B) $\overline{A}$ (C) $-A$ (D) A^t

x. Rank of $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is:
(A) 1 (B) 2 (C) 3 (D) 4

xi. If $A = \begin{vmatrix} 1 & -2 & 3 \\ -2 & 3 & 1 \\ 4 & -3 & 2 \end{vmatrix}$, then A_{33} equals:
(A) -1 (B) 1 (C) 7 (D) -7

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) If $A = \begin{bmatrix} 1 & -1 \\ a & b \end{bmatrix}$ then $A^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, find the values of a and b. (ii) Find the matrix X if $\begin{bmatrix} 5 & 2 \\ -2 & 1 \end{bmatrix} X = \begin{bmatrix} 2 & 1 \\ 5 & 10 \end{bmatrix}$

(iii) If $A = \begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$, show that A is not symmetric. (iv) If $B = \begin{bmatrix} 5 & -2 & 5 \\ 1 & -1 & 4 \\ -2 & 1 & -2 \end{bmatrix}$, find B_{21}.

(v) Without expansion show that $\begin{vmatrix} 6 & 7 & 8 \\ 3 & 4 & 5 \\ 2 & 3 & 4 \end{vmatrix} = 0$ (vi) Show that $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ yz & zx & xy \end{vmatrix} = \begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^2 & y^2 & z^2 \end{vmatrix}$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Define the identity matrix. (ii) Define a rectangular matrix. (iii) What is skew symmetric matrix?

(iv) Find x and y if $\begin{bmatrix} 2 & 0 & x \\ 1 & y & 3 \end{bmatrix} + 2\begin{bmatrix} 1 & x & y \\ 0 & 2 & -1 \end{bmatrix} = \begin{bmatrix} 4 & -2 & 3 \\ 1 & 6 & 1 \end{bmatrix}$ (v) If inverse of matrix $\begin{bmatrix} 3 & -1 \\ 2 & 1 \end{bmatrix}$.

(vi) If $\begin{bmatrix} 1 & 1+t \\ 1 & -t \end{bmatrix}$, show that $A + ((\overline{A})^t)$ is Hermitian.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Show that $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ yz & zx & xy \end{vmatrix} = \begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^2 & y^2 & z^2 \end{vmatrix}$

(b)

Use matrices to solve the following systems:

$$\left.\begin{aligned} 2x_1 + x_2 + 3x_3 &= 3 \\ x_1 + x_2 - 2x_3 &= 0 \\ -3x_1 - x_2 + 2x_3 &= -4 \end{aligned}\right\}$$

MCQs Ans Key

Q:1 (A)	Q:2 (D)	Q:3 (C)	Q:4 (C)	Q:5 (D)	Q:6 (A)
Q:7 (B)	Q:8 (B)	Q:9 (A)	Q:10 (B)	Q:11 (A)	

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 11 - Short Test (No Choice) - Marks=60				
Test Syllabus:	Unit-4,				

Q.1 Circle the correct answer. **(12x1=12)**

i. If ω is complex cube root of unity then ω=
(A) 0 (B) 1 (C) ω^2 (D) $\frac{1}{\omega^2}$

ii. The sum of the four fourth roots of unity is:
(A) 0 (B) 1 (C) -1 (D) i

iii. If one root of $x^2-3x+a=0$ is 2, then a =____ is 2, the a=:
(A) -2 (B) 2 (C) 0 (D) -3

iv. If $(x-2)$ is a factor of $ax^2-12x+4$ then a = ___:
(A) 2 (B) 5 (C) 7 (D) 0

v. **For what value of k, the roots of the equation** $x^2+\sqrt{k}\,x+1=0$ **are equal:**
(A) 1 (B) 2 (C) 3 (D) 4

vi. If α,β are the roots of $4x^2+5x-6=0$, then value of $4\alpha+4\beta$ equals:
(A) $-\frac{5}{4}$ (B) -5 (C) -6 (D) 5

vii. The real quadratic equation whose one root is $2-\sqrt{3}$ is:
(A) $x^2+4x-1=0$ (B) $x^2-4x-1=0$ (C) $x^2-4x+1=0$ (D) None of these

viii. If the roots of $x^2-bx+c=0$ are two consecutive integers, then $b^2-4c=$ ----
(A) 0 (B) -1 (C) 2 (D) 1

ix. **If a , b be the roots of** $x^2+x-3=0$**, then a – b = ...**
(A) $\pm\sqrt{13}$ (B) $\sqrt{13}$ (C) $\pm\sqrt{11}$ (D) None of these

x. If s= sum of roots and p= product of roots, then quadratic equation can be written as:
(A) $x^2+sx+p=0$ (B) $x^2-sx-p=0$ (C) $x^2-sx+p=0$ (D) $x^2+sx-p=0$

xi. If $b^2-4ac>0$ but not a perfect square, then roots are:
(A) Equal (B) Complex (C) Rational (D) Irrational

xii. **The roots of the equation** $(x-a)(x-b)+(x-b)(x-c)+(x-c)(x-a)=0$ **are:**
(A) rational (B) real (C) irrational (D) complex

Q.2 Write short answers of the following questions. **(7x2=14)**

(i) Solve the following equations by factorization: $\frac{a}{ax-1}+\frac{b}{bx-1}=a+b\,;\,x\neq\frac{1}{a},\frac{1}{b}$

(ii) Evaluate: $(-1+\sqrt{-3})^5+(-1-\sqrt{-3})^5$ (iii) If ω is a cube root of unity, form an equation whose roots are 2ω and $2\omega^2$.

(iv) Prove that $\left(\frac{1+\sqrt{-3}}{2}\right)^9+\left(\frac{1-\sqrt{-3}}{2}\right)^9=-2$.

(v) Find values of 'a' and 'b' if -2 and 2 are roots of polynomial x^3-4x^2+ax+b .

(vi) Discuss nature of roots of equation $x^2-5x+6=0$. (vii) Discuss the nature of the roots of $25x^2-30x+9=0$.

Q.3 Write short answers of the following questions. **(7x2=14)**

(i) Solve the following equations by completing the square: $x^2+4x-1085=0$

(ii) State two basic techniques for solving a quadratic equation. (iii) Reduce $2x^4-3x^3-x^2-3x+2=0$ into quadratic form.

(iv) If ω is a root of $x^2+x+1=0$, show that its other root is ω^2.

(v) If α,β are roots of $ax^2+bx+c=0, a\neq0$ form the equation whose roots are α^2,β^2 .

(vi) If α,β are the roots of the equation $ax^2+bx+c=0$, form the equations whose roots are: $\alpha+\frac{1}{\alpha},\beta+\frac{1}{\beta}$

(vii) Show that roots of the equation $px^2-(p-q)x-q=0$ will be rational.

NOTE: Attempt the following long questions. **(2x10=20)**

4(a) If the Roots of $Px^2+qx+q=0$ are α,β then prove that $\sqrt{\frac{\alpha}{\beta}}+\sqrt{\frac{\beta}{\alpha}}+\sqrt{\frac{p}{q}}=0$.

(b) Solve the following systems of equations: $12x^2-25xy+12y^2=0\,;\,4x^2+7y^2=148$

5(a) When the polynomial x^3+2x^2+Kx+4 is divided by $(x-2)$, the remainder is 14. Find the value of K.

(b) Solve the following equation: $\sqrt{3x^2-2x+9}+\sqrt{3x^2-2x-4}=13$

MCQs Ans Key

Q:1 (D)	Q:2 (A)	Q:3 (B)	Q:4 (B)	Q:5 (D)	Q:6 (B)
Q:7 (C)	Q:8 (D)	Q:9 (A)	Q:10 (C)	Q:11 (D)	Q:12 (B)

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-5,				

Q.1 Circle the correct answer. **(11x1=11)**

i. $(x+3)(x+4) = x^2+7x+12$ is:
(A) Equation (B) Function (C) Identity (D) Conditional Equation

ii. The conditional Equation $\frac{x-1}{3} = 2$ holds if x is equal to:
(A) 8 (B) 7 (C) 6 (D) 5

iii. The fraction $\frac{2x^2+5}{x-3}$ is:
(A) Proper (B) Rational (C) Polynomial (D) Improper

iv. If $\frac{3x^2-12x+11}{(x-1)(x-2)(x-3)} = \frac{A}{(x-1)} + \frac{B}{(x-2)} + \frac{C}{(x-3)}$, then A is
(A) 2 (B) 4 (C) 1 (D) None of these

v. If $\frac{1}{(1-ax)(1-bx)(1-cx)} = \frac{A}{1-ax} + \frac{B}{1-bx} + \frac{C}{1-cx}$, then C:
(A) $\frac{c^2}{(c-a)(c-b)}$ (B) $\frac{a^2}{(a-b)(a-c)}$ (C) $\frac{b^2}{(b-a)(b-c)}$ (D) None of these

vi. If (2x+1)=A(x+1)=B(x+2), then A=____
(A) 3 (B) 4 (C) 5 (D) 1

vii. If $\frac{1}{(x+1)((x-3)^2} = \frac{A}{x+1} + \frac{B}{x-3} + \frac{C}{(x-3)^2}$, then A is:
(A) $\frac{1}{16}$ (B) $\frac{1}{4}$ (C) $\frac{-1}{16}$ (D) None of these.

viii. The rational function $\frac{2x^4}{(x-3)(x+2)^2}$ is:
(A) Proper (B) Improper (C) both (D) None of these.

ix. Partial fractions of $\frac{1}{x^3+1}$ will be of the form:
(A) $\frac{A}{x+1} - \frac{Bx+C}{x^2-x+1}$ (B) $\frac{A}{x-1} + \frac{Bx+C}{x^2-x+1}$ (C) $\frac{A}{x+1} - \frac{B}{x^2-x+1}$ (D) $\frac{Ax+B}{x^2+1} + \frac{C}{x^2-x+1}$

x. The partial fractions of $\frac{x+5}{(x-1)(x^2+1)}$ are of the form:
(A) $\frac{Ax}{x-1} + \frac{B}{x^2+1}$ (B) $\frac{A}{x-1} + \frac{Bx+C}{x^2+1}$ (C) $\frac{A}{x-1} + \frac{B}{x^2+1}$ (D) None

xi. If $\frac{x^2+15}{(x^2+2x+5)(x-1)} = \frac{A}{x-1} + \frac{Bx+C}{x^2+2x+5}$, then B is:
(A) -5 (B) -1 (C) 2 (D) None of these.

Q.2 Write short answers of the following questions. **(6x2=12)**

(i)Define Conditional equation. (ii)Define Partial Fractions. (iii)Define proper and improper fraction.
(iv)Resolve $\frac{7x+25}{(x+3)(x+4)}$ into partial fractions. (v)Define equation. (vi)Resolve the following into partial fractions. $\frac{3x+7}{(x^2+4)(x+3)}$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i)Define identity and give example. (ii)Define rational fraction. (iii)Define proper and improper fraction.
(iv)Resolve $\frac{3x-11}{(x^2+1)(x+3)}$ into partial fractions.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Resolve $\frac{x^2+1}{x^3+1}$ into partial fractions.

(b) Resolve into partial fractions of $\frac{9x-7}{(x^2+1)(x+3)}$.

MCQs Ans Key

Q:1 (C)	Q:2 (B)	Q:3 (D)	Q:4 (C)	Q:5 (A)	Q:6 (A)
Q:7 (A)	Q:8 (B)	Q:9 (A)	Q:10 (B)	Q:11 (B)	

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Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-6,				

Q.1 Circle the correct answer. **(11x1=11)**

i. The next term of the sequence 1, 3, 6, 10, …… is:
(A) 13 (B) 15 (C) 17 (D) 19

ii. Sequences are also called:
(A) series (B) progressions (C) means (D) convergences

iii. What is called the arrangement of numbers formed according to some definite rule?
(A) arithmetic sequence (B) geometric sequence (C) sequence (D) none of these

iv. What is the general term of the sequence given below? 2, 4, 6, 8 .....:
(A) 2n (B) n + 1 (C) $2n^2$ (D) n^2

v. What is the common difference of the sequence 4, 9, 14, 19, 24, ……?
(A) 4 (B) 5 (C) 6 (D) 7

vi. The sum of 1, 3, 5, 7, 9, …….. upto 20 terms is:
(A) 400 (B) 563 (C) 472 (D) None of these.

vii. What is the nth term of the G.P. for which a = 3, r = –2 and n = 10?
(A) -1246 (B) -1436 (C) -1536 (D) None of these.

viii. Sum of n terms of G.P is:
(A) $\frac{n}{2}[2a+(n-1)d]$ (B) $\frac{a(1-r^n)}{1-r}$ (C) $\frac{2ab}{a+b}$ (D) $\frac{a+b}{2}$

ix. The series $a + ar + ar^2 + \ldots \infty$ is convergent if:
(A) |r| > 1 (B) |r| < 1 (C) |r| = 1 (D) $|r| \neq 1$

x. The harmonic mean between two numbers a and b is:
(A) $\frac{a+b}{2ab}$ (B) $\frac{a-b}{2ab}$ (C) $\frac{2ab}{a+b}$ (D) $\frac{2ab}{a-b}$

xi. If A,G,H have their usual meaing, $G^2 =$:
(A) H (B) A (C) A× H (D) $\frac{A}{H}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Find the 5^{th} term of the G.P. 3,6,12….. (ii) Define G.M. between any two numbers a and b.

(iii) Insert four real geometric Means between 3 and 96. (iv) Define harmonic progression.

(v) Define *n* Harmonic means between two numbers *a* and *b*.

(vi) Find A, G, H and verify that A < G < H (G > 0) , if $a = -2$, $b = -8$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Which term of the A.P -2,4,10,... is 148? (ii) Sum the series 1+4-7+10+13-16+19+22-25 to 3n terms.

(iii) Find the n^{th} term of G.P if $\frac{ab}{ab} = \frac{4}{9}$ and $a_2 = \frac{4}{9}$. (iv) Convert $2.\dot{3}\dot{3}$ into an equivalent common fraction.

(v) Find sum of infinite G.P. $2\sqrt{2}, 1, \ldots$ (vi) Find vulgar fraction equivalent to the recurring decimals $0.\overset{o}{7}$.

NOTE: Attempt a long question. **(5+5=10)**

4(a) If $y = \frac{x}{2} + \frac{1}{4}x^2 + \frac{1}{8}x^3 + \ldots$ and $0 < x < 2$, then prove that $x = \frac{2y}{1+y}$.

(b) For what value of n, $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is the positive geometric mean between 'a' and 'b'?

MCQs Ans Key

Q:1 (B)	Q:2 (B)	Q:3 (C)	Q:4 (A)	Q:5 (B)	Q:6 (A)
Q:7 (C)	Q:8 (B)	Q:9 (B)	Q:10 (C)	Q:11 (C)	

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Test Syllabus:	Unit-7,				

Q.1 Circle the correct answer. **(11x1=11)**

i. **Number of permutations of n different things taken r at a time is denoted by:**
(A) ${}^nC_r$ (B) ${}^nP_r$ (C) n! (D) None of these.

ii. ${}^nC_n =$ _____:
(A) 0 (B) 1 (C) n (D) n!

iii. If ${}^nC_8 = {}^nC_{12}$, then "n" equal to:
(A) 4 (B) 8 (C) 20 (D) 12

iv. **How many diagonals can be formed by joining the vertices of the polygon having 5 sides.**
(A) 10 (B) 15 (C) 5 (D) None of these.

v. **The number of diagonals that can be formed by joining the angular points of a 10-sided figure is:**
(A) 40 (B) 42 (C) 43 (D) 45

vi. If A and B are mutually exclusive events then $P(A \cup B)$ equal to:
(A) P(A)+P(B) (B) P(A)-P(B)
(C) P(AB) (D) $P(A)+P(B)-P(A \cap B)$

vii. In a single throw of two dice what is the probability of not getting the same number on both the dice ?
(A) $\frac{1}{6}$ (B) $\frac{4}{3}$ (C) $\frac{5}{6}$ (D) None of the above

viii. **Probability of an impossible event is:**
(A) 0 (B) 1 (C) - 1 (D) ¥

ix. **A dice is thrown. What is the probability to get an odd number ?**
(A) 1 (B) 3/4 (C) 1/2 (D) None of the above

x. **A dice is thrown. What is the probability to get an even number ?**
(A) 1 (B) 3/4 (C) 1/2 (D) None of the above

xi. **A card is drawn from a pack of 52 cards at random. What is the probability, that it is neither a heart nor a king ?**
(A) $\frac{1}{13}$ (B) $\frac{9}{13}$ (C) $\frac{2}{13}$ (D) None of the above

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Write $(n+2)(n+1)(n)$ in factorial form. (ii) Evaluate $\frac{6!}{3!3!}$ and $\frac{8!}{4!2!}$. (iii) Evaluate ${}^{20}P_3$ without calculator.

(iv) There are 8 men and 10 women members of a club. How many committees of seven can be formed having at 4 women?

(v) Evaluate ${}^{20}C_{17}$. (vi) Find the value of n and r when ${}^nC_r = 35$ and ${}^nP_r = 210$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Evaluate $\frac{9!}{2!(9-2)!}$ (ii) State fundamental principle of counting. (iii) Define Circular Permutation.

(iv) How many Necklaces can be made from 6 beads of different colours? (v) Find the number of diagonals of 5 sided figure.

(vi) A fair die is thrown twice. Find the probability that a prime number of dots appears in the first thrown and the number of dots in the second throw is less than 5.

NOTE: Attempt a long question. **(5+5=10)**

4(a) How many 6-digit numbers can be formed, without repeating any digit from the digits 0,1,2,3,4,5? In how many of them will 0 be at the tens place?

(b) Prove that ${}^{n-1}C_r + {}^{n-1}C_{r-1} = {}^nC_r$.

MCQs Ans Key

Q:1 (B)	Q:2 (B)	Q:3 (C)	Q:4 (C)	Q:5 (D)	Q:6 (A)
Q:7 (C)	Q:8 (A)	Q:9 (C)	Q:10 (C)	Q:11 (B)	

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-8,				

Q.1 Circle the correct answer. **(11x1=11)**

i. The inequality $4^n > 3^n + 4$ is true for:
(A) $n = 1$ (B) $n \geq 2$ (C) $n = 0$ (D) $n < 2$

ii. The statement $4^k < 3^k + 4$ is true for:
(A) k<2 (B) k≤2 (C) k≠2 (D) k≥2

iii. The middle term in the expansion of $(x-y)^{12}$ is:
(A) 6th (B) 5th (C) 7th (D) 8th

iv. Coefficient of 8th term in the expansion of $(a+b)^{10}$ is:
(A) ${}^{10}C_7$ (B) ${}^{10}P_8$ (C) ${}^{8}C_{10}$ (D) ${}^{8}P_{10}$

v. Number of terms in the expansion of $(1+x)^{2n+1}$ is:
(A) 2n+1 (B) 2n (C) 2n+2 (D) 3n+1

vi. The number of terms in the expansion of $(a+b)^n$ is:
(A) n (B) n+1 (C) n-1 (D) n+2

vii. The middle term in the expansion of $(1+2x)^6$ is:
(A) Third (B) Fourth (C) Fifth (D) Sixth

viii. In the expansion of $(2x^3 - \frac{1}{2a})^6$ the coefficient of x^{12} is:
(A) 64 (B) $-\frac{96}{a}$ (C) $\frac{60}{a^2}$ (D) $-\frac{20}{a^5}$

ix. **The co-efficient of x^n is the binomial expansion of $(1+x)^n$ is:**
(A) n + 1 (B) n (C) 2n (D) 2^n

x. **In the expansion of $(a+b)^n$, the index of a _____ by one,**
(A) Increases (B) Decreases (C) Remains unchanged (D) None of these

xi. If $y = \frac{1}{3} + \frac{1.3}{2!}(\frac{1}{3})^2 + \frac{1.3.5}{3!}(\frac{1}{3})^3 + \ldots \infty$, then
(A) $y^2 + 2y - 2 = 0$ (B) $y^2 + 2y + 2 = 0$ (C) $y^2 + y - 2 = 0$ (D) $y^2 - 2y - 2 = 0$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) State Principle of Mathematical Induction. (ii) Show that $n^3 - n$ is divisible by 6 for n = 2,3.

(iii) Prove that $\binom{3}{3} + \binom{4}{3} + \binom{5}{3} + \ldots + \binom{n+2}{3} = \binom{n+3}{4}$ is true for n=1,2. (iv) Find the general term of $(\frac{a}{2} - \frac{2}{a})^6$.

(v) Calculate $(0.97)^3$ by means of Binomial Theorem.

(vi) If x is so small that its cube and higher powers can be neglected, then show that $\sqrt{1-x-2x^2} = 1 - \frac{x}{2} - \frac{9}{8}x^2$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Prove the formula $1 + 3 + 5 + 7 + \ldots + (2n-1) = n^2$ for n=1,2. (ii) Use binomial theorem to Evaluate $(9.9)^5$.

(iii) Show that $\binom{n}{1} + 2\binom{n}{2} + 3\binom{n}{3} + \ldots + n\binom{n}{n} = n2^{n-1}$. (iv) Expand $(1-x)^{\frac{1}{2}}$ upto four terms.

(v) Expand $(8-2x)^{-1}$ upto 2 terms.

(vi) If x is so small that its square and higher powers can be neglected then show that $\frac{\sqrt{1+2x}}{\sqrt{1-x}} \approx 1 + \frac{3}{2}x$.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Identify the following series as binomial expansion and find the sum in each case:

$$1 - \frac{1}{2}(\frac{1}{2}) + \frac{1.3}{2.4}(\frac{1}{2})^2 - \frac{1.3.5}{2.4.6}(\frac{1}{2})^3 + \ldots$$

(b) Using binomial theorem, expand the following: $\left(\frac{x}{2y} - \frac{2y}{x}\right)^8$

MCQs Ans Key

Q:1 (B)	Q:2 (A)	Q:3 (C)	Q:4 (A)	Q:5 (C)	Q:6 (B)
Q:7 (B)	Q:8 (C)	Q:9 (A)	Q:10 (B)	Q:11 (A)	

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Test Syllabus:	Unit-9,				

Q.1 Circle the correct answer. **(11x1=11)**

i. A right angle is equal to:
(A) $90^{"}$ (B) $90'$ (C) 90^o (D) 60^o

ii. 1^o equals:
(A) $\frac{\pi}{180}$rad (B) $\frac{180}{\pi}$rad (C) $\frac{\pi}{90}$rad (D) $\frac{\pi}{360}$rad

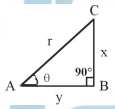
iii. $\frac{5\pi}{4}$ radian=_____:
(A) 360^o (B) 335^o (C) 270^o (D) 225^o

iv. In a right D ABC, where Đ B = 90^o , m AB = m BC , then m Đ A is equal to
(A) 30^o (B) 45^o (C) 60^o (D) 90^o

v. In fourth quadrant cos q is always ----------, where a is in standard position:
(A) Positive (B) Negative (C) Zero (D) Positive and Negative

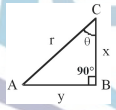
vi. In fourth quadrant sec q is always ----------, where a is in standard position:
(A) Positive (B) Negative (C) Zero (D) Positive and Negative

vii. From given figure cos q = ----------



(A) $\frac{x}{r}$ (B) $\frac{y}{r}$ (C) $\frac{r}{x}$ (D) $\frac{r}{y}$

viii. From given figure cos q = ----------



(A) $\frac{x}{r}$ (B) $\frac{y}{r}$ (C) $\frac{r}{x}$ (D) $\frac{r}{y}$

ix. Value of $\sec 30^o$ = ----------
(A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) $\frac{1}{\sqrt{2}}$ (D) $\frac{2}{\sqrt{3}}$

x. $1 + \cot^2\theta = \csc^2\theta$, for all q Î R but:
(A) q = np , n Î z (B) q ¹ np , n Î z (C) q ¹ n$\frac{\pi}{2}$, n Î z (D) q ¹ (2n + 1) $\frac{\pi}{2}$, n Î z

xi. $\frac{\cos^3 x - \sin^3 x}{\cos x - \sin x}$ ----------
(A) $1 - \frac{\sin 2x}{2}$ (B) $1 + \frac{\sin 2x}{2}$ (C) $1 + \sin 2x$ (D) $\frac{\sin 2x}{2} - 1$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Find θ when l = 1.5 cm, r = 2.5 cm . (ii) Verify $\sin 2\theta = 2\sin\theta\cos\theta$ for $\theta = 45^o$.

(iii) In which quadrant are the terminal arms of the angle lie when: $\cot\theta > 0$ and $\sin\theta < 0$

(iv) Verify the following: $2\sin 45^o + \frac{1}{2}\operatorname{cosec} 45^o = \frac{3}{\sqrt{2}}$ (v) Prove that $\sin^2\frac{\pi}{6} + \sin^2\frac{\pi}{3} + \tan^2\frac{\pi}{4} = 2$.

(vi) Prove that $\sec^2\theta - \operatorname{cosec}^2\theta = \tan^2\theta - \cot^2\theta$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Express the following sexagesimal measures of angles in radians: $154^o 20''$

(ii) What is the length of the arc intercepted on a circle of radius 14 cm by the arms of central angle of 45^o?

(iii) If $\sin\theta = -\frac{1}{\sqrt{2}}$, then find the value of $\cos\theta$ if θ does not lie in the III quadrant.

(iv) An arc substants an angle of 70^0 at the centre of a circle. Arc length is 132m. Find the radius.

(v) Prove that $\cos^4\theta - \sin^4\theta = \cos^2\theta - \sin^2\theta$. (vi) Prove that $\sec^2 A + \operatorname{cosec}^2 A = \sec^2 A \operatorname{cosec}^2 A$.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Show that:
$\sin^6\theta - \cos^6\theta = (\sin^2\theta - \cos^2\theta)(1 - \sin^2\theta\cos^2\theta)$ $\sin^6\theta - \cos^6\theta = (\sin^2\theta - \cos^2\theta)(1 - \sin^2\theta\cos^2\theta)$

(b) Prove the identity: $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \tan\theta + \sec\theta$

MCQs Ans Key

Q:1 (C)	Q:2 (A)	Q:3 (D)	Q:4 (B)	Q:5 (A)	Q:6 (A)
Q:7 (B)	Q:8 (A)	Q:9 (D)	Q:10 (B)	Q:11 (B)	

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Name:		Roll#:		Class:	Inter Part-I
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Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-10,				

Q.1 Circle the correct answer. **(11x1=11)**

i. $\cot(\frac{3\pi}{2}-\theta)$ is equal to:

(A) $\tan\theta$ (B) $-\tan\theta$ (C) $\cot\theta$ (D) None of these

ii. If q = 30°, then its reference angle is:

(A) 30° (B) 15° (C) 60° (D) 40°

iii. If q = 150°, then its reference angle is:

(A) 30° (B) 15° (C) 60° (D) 40°

iv. $\tan(\frac{3\pi}{2}-\theta)$ where q is a basic angle,will have terminal side in:

(A) quad. I (B) quad. II (C) quad. III (D) quad. IV

v. $\cos 540^o$ = ----------

(A) $-\frac{3}{\sqrt{2}}$ (B) $\frac{1}{\sqrt{2}}$ (C) $\sqrt{2}$ (D) 0

vi. $\sec(-960^o)$ = ----------

(A) 0 (B) 2 (C) -2 (D) $\sqrt{2}$

vii. If q lies in second quadrant, then its reference angle is:

(A) q (B) p – q (C) q – p (D) 2p – q

viii. $\sin\theta$ equals:

(A) $2\sin^2\frac{\theta}{2}$ (B) $2\sin\frac{\theta}{2}\cos\frac{\theta}{2}$ (C) $2\cos^2\frac{\theta}{2}$ (D) $2\tan\frac{\theta}{2}$

ix. $\cos 3q$ = ----------

(A) $4\cos^3\theta-3\cos\theta$ (B) $4\sin^3\theta-3\cos\theta$ (C) $3\sin\theta-4\cos^3\theta$ (D) $3\sin\theta-4\sin^3\theta$

x. $\sin 15^o$ .....

(A) $\frac{\sqrt{3}+1}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (C) $\frac{\sqrt{3}}{2\sqrt{2}}$ (D) $\frac{2\sqrt{2}}{\sqrt{3}-1}$

xi. $\sin q + \sin f$ = ----------

(A) $2\cos\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$ (B) $2\sin\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$ (C) $2\cos\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$ (D) $-2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Express $\sin 319^o$ as a trigonomal function of an angle of positive degree measure less than 45^o.

(ii) If α,β,γ are the angles of a triangle ABC, prove than prove that $\cos(\alpha+\beta) = -\cos\gamma$.

(iii) Without using table or calculator, find $\tan(1110^o)$. (iv) Prove that $\cos(\alpha+\beta)\cos(\alpha-\beta) = \cos^2\alpha - \sin^2\beta$.

(v) Find the value of $\cos 105^o$. (vi) Prove $\cos 3\alpha = 4\cos^3\alpha - 3\cos\alpha$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Write the fundamental Law of trigonometry.

(ii) If α,β,γ are angles of a triangle ABC, then prove that $\tan(\alpha+\beta)+\tan\gamma = 0$. (iii) Prove that $\tan(270^o-\theta) = \cot\theta$.

(iv) Prove that $\frac{\sin 2\alpha}{1+\cos 2\alpha} = \tan\alpha$. (v) Prove the identity $1+\tan\alpha\tan 2\alpha = \sec 2\alpha$.

(vi) Express the following sums or differences as products: $\sin 8\theta - \sin 4\theta$

NOTE: Attempt a long question. **(5+5=10)**

4(a) Show that (without tables/calculator) $\cos 20^o \cos 40^o \cos 80^o = \frac{1}{8}$.

(b) Prove that $\frac{\sin\theta+\sin 3\theta+\sin 5\theta+\sin 7\theta}{\cos\theta+\cos 3\theta+\cos 5\theta+\cos 7\theta} = \tan 4\theta$.

MCQs Ans Key

Q:1 (A)	Q:2 (A)	Q:3 (A)	Q:4 (C)	Q:5 (D)	Q:6 (C)
Q:7 (B)	Q:8 (B)	Q:9 (A)	Q:10 (B)	Q:11 (B)	

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-11,				

Q.1 Circle the correct answer. **(11x1=11)**

i. Range of tanx is equal to:
(A) Q (B) R (C) Z (D) N

ii. Range of $sin\,2x$ is:
(A) [-1,1] (B) [-2,2] (C) (-1,1) (D) (-2,2)

iii. Range of $y = sin\,x$ is:
(A) (-1,1) (B) [-1,1) (C) [-1,1] (D) (-1,1]

iv. The period of $3\,tan\,3x$ is equal to:
(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{2\pi}{3}$ (D) π

v. Period of $y = tan\,\theta$ is:
(A) 4π (B) 3π (C) 2π (D) π

vi. Period of $5\,tan\,2x$ is:
(A) π (B) 2π (C) 5π (D) $\frac{\pi}{2}$

vii. The domain of csc x is:
(A) R (B) [-1, 1]
(C) $R - \{x \mid x = (2n+1)\frac{\pi}{2}, n \epsilon Z\}$ (D) $R - \{x \mid x = n\pi, n \epsilon Z\}$

viii. The period of csc 3x is:
(A) p (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$

ix. The period of $csc\frac{x}{3}$ is:
(A) p (B) 2π (C) 4π (D) 6π

x. The period of $7\,sec\frac{x}{3}$ is:
(A) p (B) 2π (C) 4π (D) 6π

xi. The period of $5\,sec\frac{x}{3}$ is:
(A) p (B) 2π (C) 4π (D) 6π

Q.2 Write short answers of the following questions. **(6x2=12)**

(i)Find the period of $cos\,2x$. (ii)Find the period of $sin\frac{x}{3}$. (iii)Find the period of $sin\left(\frac{x}{5}\right)$. (iv)Find the period of $tan\frac{x}{7}$. (v)Find the period of $cot\,8x$. (vi)Find the period of $3\,cos\left(\frac{x}{5}\right)$.

Q.3 Write short answers of the following questions. **(6x2=12)**

NOTE: Attempt a long question. **(5+5=10)**

MCQs Ans Key

Q:1 (B)	Q:2 (A)	Q:3 (C)	Q:4 (B)	Q:5 (D)	Q:6 (D)
Q:7 (D)	Q:8 (D)	Q:9 (D)	Q:10 (D)	Q:11 (D)	

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 11 - Short Test (No Choice) - Marks=60				
Test Syllabus:	Unit-12,				

Q.1 Circle the correct answer. **(12x1=12)**

i. A right angle is equal to:
(A) 90" (B) 90' (C) 90^o (D) 60"

ii. The sum of the three angles of a triangle is:
(A) 360^o (B) 270^o (C) 180^o (D) 90^o

iii. If 2s = a + b + c, then in any triangle ABC:
(A) $\tan\frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ (B) $\tan\frac{B}{2} = \sqrt{\frac{(s-a)(s-c)}{s(s-b)}}$ (C) $\tan\frac{C}{2} = \sqrt{\frac{(s-a)(s-b)}{s(s-c)}}$
(D) All of above

iv. In any triangle ABC, c cos A + a cos C = ...
(A) a (B) b (C) c (D) 0

v. The law of cosines states that in a general triangle ABC $a^2 = b^2 + c^2$.....:
(A) 2 bc cos a (B) 2 ac cos b (C) 2 ab cos g (D) None of these

vi. With usual notations area of triangle ABC is:
(A) $\sqrt{(s-a)(s-b)(s-c)}$ (B) $\frac{b}{2\sin\beta}$
(C) $\frac{ac\sin\beta}{2}$ (D) $ab\sin\gamma$

vii. $\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma}$ is called the law of:
(A) tangents (B) cosine (C) sines (D) cotangents

viii. With usual notations, in any triangle ABC, if $\Delta = 20$, a = 4, b = 6, c = 10, then r equals.
(A) 2 (B) 5 (C) 10 (D) 15

ix. For any triangle ABC, with usual notations r_2 is equal to:
(A) $\frac{\Delta}{s-a}$ (B) $\frac{\Delta}{s-c}$ (C) $\frac{\Delta}{s-b}$ (D) $\frac{\Delta}{s}$

x. With usual notation r : R : r_1 = ____:
(A) 1:2:3 (B) 3:2:1 (C) 2:1:3 (D) 2:3:1

xi. The in-radius r of a triangle is given by:
(A) $\frac{\Delta}{s}$ (B) $\frac{abc}{4\Delta}$ (C) $\frac{c}{2\sin\gamma}$ (D) $\frac{1}{2}bc\sin A$

xii. With usual notations, radius r of iscribed circle is given by:
(A) $\frac{\Delta}{s}$ (B) $\frac{s}{\Lambda}$ (C) $\frac{\Delta}{s-c}$ (D) $\frac{4\Delta}{abc}$

Q.2 Write short answers of the following questions. **(7x2=14)**

(i) Find the values of $\cos 52^o13'$

(ii) A kite is flying at a height of 67.2m is attached to a fully stretched string inclined at an angle of 50^o to the horizontal. Find the length of the string.

(iii) Solve the ΔABC, if $b = 125, \gamma = 53^o, \alpha = 47^o$. (iv) Solve the ΔABC in which a=3, c=6 and $\beta = 36^o20'$.

(v) Find area of triangle ABC if a=32.65, b=42.81, c=64.92.

(vi) Find the area of the triangle ABC if $b = 37, c = 45, \alpha = 30^o50'$. (vii) Prove that $R = \frac{abc}{4\Delta}$.

Q.3 Write short answers of the following questions. **(7x2=14)**

(i) Solve the right triangle ABC in which $\gamma = 90^o, a = 3.28, b = 5.74$. (ii) Write the Law of sines.

(iii) Solve the ΔABC in which: $b = 14.8, c = 16.1, \alpha = 42^o45'$

(iv) Find the area of ΔABC for $b = 25.4, \gamma = 36^o41'$ and $\alpha = 45^o17'$.

(v) Find area of triangle ABC in which $a = 200, b = 120, r = 150^o$. (vi) Prove that $r_1r_2r_3 = rs^2$.

(vii) Show that $r_1 = 4R\sin\frac{\alpha}{2}\cos\frac{\beta}{2}\cos\frac{\gamma}{2}$

NOTE: Attempt the following long questions. **(2x10=20)**

4(a) Prove that $abc(\sin\alpha + \sin\beta + \sin\gamma) = 4\Delta s$.

(b) Prove that in an equilateral triangle r : R : $r_1 : r_2 : r_3 = 1 : 2 : 3 : 3 : 3$.

5(a) Solve the triangle ABC if a=53, $\beta = 88^o36', \gamma = 31^o54'$.

(b)

Solve the triangle ABC, in which a=36.21, c=30.14 and $\beta = 78^{o}10'$ by using first law of tangents and then law of sines.

MCQs Ans Key

Q:1 (C)	Q:2 (C)	Q:3 (D)	Q:4 (B)	Q:5 (A)	Q:6 (C)
Q:7 (C)	Q:8 (A)	Q:9 (C)	Q:10 (A)	Q:11 (A)	Q:12 (A)

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Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-13,				

Q.1 Circle the correct answer. **(11x1=11)**

i. Range of the function $y = sin^{-1}x$ is:
(A) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (B) $0 \leq y \leq \pi$ (C) $-1 \leq x \leq 1$ (D) $-1 \leq y \leq 1$

ii. Domain of $sin\, x$ is:
(A) [-1, 1] (B) $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$ (C) R (D) Q

iii. $cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$ is equal to:
(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{4}$ (D) $\frac{\pi}{3}$

iv. $cot^{-1}(-1) =$_____:
(A) $\frac{3\pi}{4}$ (B) $\frac{\pi}{4}$ (C) $\frac{-3\pi}{4}$ (D) $\frac{-\pi}{4}$

v. The range of $y = tan^{-1}x$ is:
(A) $]0, \pi[$ (B) $]-\frac{\pi}{2}, \frac{\pi}{2}[$ (C)] -1, 1[(D) $]-\infty, \infty[$

vi. The domain of principal contangent function is:
(A)]-1,1[(B) $]-\infty, \infty[$ (C) $]0, \pi[$ (D) $]-\frac{\pi}{2}, \frac{\pi}{2}[$

vii. The range of principal secant function i.e., y= secx is:
(A) x £ - 1 or x ³ 1 (B) x ³ - 1 or x £ 1 (C) y £ - 1 or y ³ 1 (D) y ³ - 1 or y £ 1

viii. $y = sec^{-1}x$ if and only if x = sec y, where $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}; x \neq \frac{\pi}{2}$
(A) $y \geq -1\, or\, y \geq 1$ (B) $y \leq -1\, or\, y \leq 1$ (C) $y \leq -1\, or\, y \geq 1$ (D) $y < -1\, or\, y > 1$

ix. The principal value of $sin^{-1}(-\frac{\sqrt{3}}{2})$ is:
(A) $\frac{\pi}{3}$ (B) $\frac{5\pi}{3}$ (C) $\frac{2\pi}{3}$ (D) $-\frac{\pi}{3}$

x. $tan(\pi + tan^{-1}x)$ =_____
(A) x (B) $\pi + x$ (C) $\pi - x$ (D) None of these.

xi. $tan^{-1}A - tan^{-1}B$ =_____
(A) $tan\left(\frac{A-B}{1+AB}\right)$ (B) $tan^{-1}\left(\frac{A-B}{1+AB}\right)$ (C) $tan^{-1}\left(\frac{A+B}{1-AB}\right)$ (D) $tan^{-1}\left(\frac{A+B}{1+AB}\right)$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i)Find the domain and range of $sec\, x$. (ii)Evaluate $tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)$. (iii)Show that $tan\left(sin^{-1}x\right) = tan^{-1}\left(\frac{A+B}{1-AB}\right)$.

(iv)Show that $cos^{-1}(-x) = \pi - cos^{-1}x$. (v)Show that $sin^{-1}(-x) = -sin^{-1}x$.

(vi)Prove that $tan^{-1}\frac{1}{4} + tan^{-1}\frac{1}{5} = tan^{-1}\frac{9}{19}$.

Q.3 Write short answers of the following questions. **(6x2=12)**

NOTE: Attempt a long question. **(5+5=10)**

4(a) Prove that: $tan^{-1}\frac{1}{11} + tan^{-1}\frac{5}{6} = tan^{-1}\frac{1}{3} + tan^{-1}\frac{1}{2}$

(b) Prove that $2\,tan^{-1}\left(\frac{2}{3}\right) = sin^{-1}\left(\frac{12}{13}\right)$.

MCQs Ans Key

Q:1 (A)	Q:2 (B)	Q:3 (B)	Q:4 (A)	Q:5 (B)	Q:6 (C)
Q:7 (C)	Q:8 (C)	Q:9 (D)	Q:10 (A)	Q:11 (B)	

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-I
Subject:	Mathematics-11	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) Marks=45				
Test Syllabus:	Unit-14,				

Q.1 Circle the correct answer. **(11x1=11)**

i. If $\cos x = -\frac{\sqrt{3}}{2}$ then reference angle of $\cos x$ is:
(A) $\frac{\pi}{6}$ (B) $-\frac{\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{5\pi}{6}$

ii. Solution set of $\tan 2x = 1$ in $[0, 2\pi]$ is equal to:
(A) $\{\frac{\pi}{4}, \frac{5\pi}{4}\}$ (B) $\{\frac{\pi}{8}, \frac{5\pi}{8}\}$ (C) $\{\frac{\pi}{4}, \frac{3\pi}{4}\}$ (D) $\{\frac{\pi}{6}, \frac{5\pi}{6}\}$

iii. If $\cos 2x = 0$ then solution in 1st quadrant is:
(A) 30^o (B) 45^o (C) 60^o (D) 15^o

iv. For solution of trigonometric equation containing more than one trigonometric functions, the trigonometric functions are transformed into ---------- trigonometric function:
(A) One (B) Two (C) Three (D) None of the above

v. Solutions of the equation $\sin x = \frac{\sqrt{3}}{2}, x \varepsilon [0, \pi]$ is:
(A) $\frac{\pi}{3}, \frac{2\pi}{3}$ (B) $\frac{\pi}{6}, \frac{\pi}{3}$ (C) $\frac{\pi}{3}, \frac{5\pi}{3}$ (D) None of the above

vi. $\tan x = -1$ then general value of x is:
(A) $\{\frac{3\pi}{4} + n\pi\}$ (B) $\{\frac{\pi}{6} + n\pi\}$ (C) $\{\frac{\pi}{2} + n\pi\}$ (D) $\{\frac{\pi}{3} + n\pi\}$

vii. Solution of equation $tan\, x = \frac{1}{\sqrt{3}}$ is:
(A) I & III quad. (B) I & II quad. (C) II & IV quad. (D) I quad.

viii. If $\cos 3\theta = 1$, and θ lies in $[0, \pi]$ then θ is equal to:
(A) 0 and π (B) π and $\frac{\pi}{2}$ (C) 0 and 2π (D) 0 and $\frac{2\pi}{3}$

ix. Solution of equation $\tan x = \frac{1}{\sqrt{2}}$ lies in the quadrants:
(A) I and II (B) II and III (C) I and III (D) I and IV

x. The reference angle for $\tan\theta = \sqrt{3}$ is:
(A) $\frac{\pi}{6}$ (B) $-\frac{\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $-\frac{\pi}{3}$

xi. The solution of $\tan x = \frac{1}{\sqrt{3}}$ for $x \epsilon [0, \pi]$ is
(A) $\frac{\pi}{2}$ (B) $\{\frac{\pi}{6}\}$ (C) $\{\frac{\pi}{3}\}$ (D) $\{\frac{\pi}{4}\}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i)Solve the equation $\sin x = \frac{1}{2}$ in $[0, 2\pi]$. (ii)Find the solution of the equation $\text{cosec}\,\theta = 2$ which lies in $[0, 2\pi]$.

(iii)Solve the Trigonometric Equation: $\text{cosec}^2\theta = \frac{4}{3}$, $\theta \in [0, 2\pi]$ (iv)Solve $2\sin^2\theta - \sin\theta = 0$ for $\theta \in [0, \pi]$.

(v)Find solution of $4\cos^2 x - 3 = 0$ when $x \in [0, \pi]$.

(vi)Find the value of θ, satisfying the equation $3\tan^2\theta + 2\sqrt{3}\tan\theta + 1 = 0$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i)Find the solution of the following equation which lie in $[0, 2\pi]$: $\sin x = -\frac{\sqrt{3}}{2}$

(ii)Find the solution of the Equation $\sec x = -2$: which lies in $[0, 2\pi]$.

(iii)Find the solution of the Equation: $\cot\theta = \frac{1}{\sqrt{3}}$ which lie on $[0, 2\pi]$.

(iv)Solve the Trigonometric Equation: $\tan^2\theta = \frac{1}{3}$; $\theta \in [0, 2\pi]$

(v)Solve the Trigonometric Equation: $\sec^2\theta = \frac{4}{3}$; $\theta \in [0, 2\pi]$

(vi)Find the values of θ satisfying the equation $-1 \le \sin\theta \le 1$: $2\sin^2\theta - \sin\theta = 0$.

NOTE: Attempt a long question. **(5+5=10)**

MCQs Ans Key

Q:1 (A)	Q:2 (B)	Q:3 (B)	Q:4 (A)	Q:5 (A)	Q:6 (A)
Q:7 (A)	Q:8 (C)	Q:9 (C)	Q:10 (C)	Q:11 (B)	