Q10. Prove that : $\frac{Cos\ 4x+Cos\,3x+Cos\,2x}{Sin\,4x+Sin\,3x+Sin\ 2x}=Cot\ 3x$

Q11. Find the mean deviation about the median of the following data:

Class:	0-6	6-12	12-18	18-24	24-30
Freq.:	8	10	12	9	5

Q12. Prove that: $41^n - 14^n$ is a multiple of 27 by using the principle of mathematical induction for all $n \in N$.

Q13. If find $\left|\frac{Z_1+Z_2+1}{Z_1-Z_2+i}\right|$

Q14. Show that: $\tan 3x\ \tan 2x\ \tan x = \tan\ 3x - \tan\ 2x - \tan x$

Q15. Convert into the polar form.

Q16. Prove using principle of mathematical induction for all $n \in N$:

Q17. Solve and represent the solution graphically on number line:

$2(x-1) < x+5,\ \ 3(x+2) > 2-x$

Q18. Solve the equation by factorization method only.

Q19. Rewrite the following statement with "if-then" in five different ways conveying the same meaning.

"If a natural number is even, then its square is also even."

Section - C

Q20. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 men and only 3 men got medals in all three sports, how many of them received medals in exaclty two of three sports.

Q21. If $\tan x = \frac{3}{4},\quad \pi < x < \frac{3\pi}{2}$; find $sin\ \frac{x}{2}, cos\ \frac{x}{2}\ and\ \tan\ \frac{x}{2}$

Q22. Calculate standard Deviation for following distribution:

Marks:	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of students	3	6	13	15	14	5	4

Q23. Solve: $2x^2 - (3+7i)x - (3-9i) = 0$

Q24. Solve the following system of inequalities graphically:

$3x\,2y \le 150,\ \ x + 4y \le 80,\ \ x \le 15,\ \ y \ge 0$

Q25. Using principle of mathematical induction, prove that

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

for all $n \in N$.

Q26. (A) Find the principle solution of (2)

(B) Find the general solution of (4)

Budha Dal Public School Patiala (19 Sept. 15)

UNIT-I

Class-XI (SET - B)

(Non-Med, Comm, Hum)

Mathematics

Time: 3 hrs. **Marks: 100**

Note: All the questions are compulsory

2) Q 1 to 6 carry 1 mark each.

3) Q 7 to 19 carry 4 marks each.

4) Q 20 to 26 carry 6 marks each.

SECTION - A

Q1. Find the multiplicative inverse of .

Q2. Check whether the given statement is true or false?

"All integers are positive or negative."

Q3. Solve $-12x > 30$ Where is an integer.

Q4. Convert 6 radians into degree measure.

Q5. If , write $P(X)$.

Q6. Write the following in the set builder form: $\{2, 4, 8, 16, 32\}$

Section - B

Q7. If in two circles, arcs of the same length subtend angles 60^0 and 75^0 at the centre, find the ratio of their radii.

Q8. Solve $\frac{2x-1}{3} \geq \frac{3x-2}{4} - \frac{(2-x)}{5}$

Q9. Verify De Morgan's Law for the given sets.

$U = \{1, 2, 3, 4, 5, 9, 10\}$, $A = \{1, 9, 10\}$, $B = \{1, 2, 4, 5, 10\}$

Q9. Prove that $Cos\,6x = 32\cos^6 x - 48\,Cos^4 x + 18\,Cos^2 x - 1$

Q10. Prove that $x^{2n} - y^{2n}$ is divisible by $x + y$ by using the principle of mathematical induction for all .

Q11. Rewrite the following statement with "if-then" in five different ways conveying the same meaning.
"If a natural number is odd, then its sqaure is also odd."

Q12. If then show that $\frac{u}{x} + \frac{v}{y} = 4\,(x^2 - y^2)$.

Q13. Solve : $\frac{x}{2} \le \frac{5x-2}{3} - \frac{(7x-3)}{5}$

Q14. Convert $\frac{1+3i}{1-2i}$ into the polar form.

Q15. Verify De Morgan's Law for the following set:

$U = \{7, 8, 11, 15, 21, 27, 28\}$, $A = \{8, 11, 21\}$, $B = \{7, 15, 21, 27, 28\}$

Q16. Calculate the mean deviation from median of the following data:

Wages/week (in Rs.)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of workers	4	6	10	20	10	6	4

Q17. If the arcs of same lengths in two circles subtend angle 65^0 and 110^0 at the centre. Find the ratio of their radii.

Q18. Solve the equation $x^2 - 4x + 13 = 0$ by factorization method only.

Q19. Solve and represent the solution graphically on number line:

$3x - 7 > 2(x - 6), 6 - x > 11 - 2x$

Section - C

Q20. a) Find the principle solution of (2)

b) Find the general solution of $Sin\,x + Sin\,3x + Sin\,5x = 0$ (4)

Q21. Using principle of mathematical induction prove for all .

Q22. Solve $x^2 - (7-i)\,x + (18-i) = 0$ *over* C

Q23. Calculate the standard deviation for the following distribution

Income (Rs.)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000
No. of Families	18	26	30	12	10	4

Q24. Solve graphically the following system of equation:

$x - 2y \le 3,\ 3x + 4y \ge 12,\ x \ge 0,\ y \ge 1$

Q25. In a survey of 60 people, it was found that 25 read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all newspapers, find
(i) the number of people who read at least one of the newspaper.
(ii) the number of people who read exactly one newspaper.

Q26. Find if $Cos\,x = -\frac{1}{3}$, x in quadrant III.

Budha Dal Public School Patiala (19 Sept. 15)

UNIT-I

Class-XI (SET - A)

(Non-Med, Comm, Hum)

Mathematics

Time: 3 hrs. **Marks: 100**

Note: All the questions are compulsory

2) **Q 1 to 6 carry 1 mark each.**
3) **Q 7 to 19 carry 4 marks each.**
4) **Q 20 to 26 carry 6 marks each.**

SECTION - A

Q1. Convert 4 radians into degree measure.

Q2. Solve where is an integer.

Q3. If , write $P(A)$

Q4. Write the following set in the set-builder form:

$\{5, 25, 125, 625\}$

Q5. Write the contrapositive of the following statement:

" If a triangle is equilateral, it is isosceles."

Q6. Find the multiplicative inverse of $\sqrt{5}+3i$.

Section-B

Q7. Prove that: $\dfrac{Sin\,5x-2Sin\,3x+Sinx}{Cos\,5x-Cos\,x}=\tan x$

Q8. Prove using principle of mathematical induction of all $n \in N$.