THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1.   Solve the following: (6x5=30)

1. Separate $\dfrac{i}{1+i}$ into real and imaginary parts.
2. Find the multiplicative inverse of $(-a, b)$.
3. Find the inverse of the relation $\{(x, y)|y = 2x + 3, x \in R\}$
4. If x is so small that its square and higher powers can be neglected, show that $\dfrac{1-x}{\sqrt{1+x}} = 1 - \dfrac{3}{2}x$
5. Define degree measure and radian measure of angle.
6. Find r, when $l = 56cm$ and $\theta = 45°$

Solve the following: (3x10=30)

Q 2 (a) Without using table or calculator find the values of $\sin 105°$ and $\cos 105°$

(b) Without expansion verify that $\begin{vmatrix} -a & 0 & c \\ 0 & a & -b \\ b & -c & 0 \end{vmatrix} = 0$

Q 3 a) Define skew-symmetric matrix and give an example.

b) If A and B are symmetric and $AB = BA$, show that AB is symmetric.

Q 4 a) Solve $x(x + 7) = (2x - 1)(x + 4)$.

b) If α, β are the roots of the equation $ax^2 + bx + c = 0$, then find the value of $\alpha^2 + \beta^2$.