Step-1

Let $\lambda_1, \lambda_2, ..., \lambda_n$ be Eigen values of A.

It is given that A Is positive definite.

This implies;

$\lambda_1 > 0,\ \lambda_2 > 0,\ \ldots, \lambda_n > 0.$

It is known that if $\lambda_1, \lambda_2, ..., \lambda_n$ are Eigen values of A then $\lambda_1^2, \lambda_2^2, ..., \lambda_n^2$ are Eigen values of A^2.

Clearly $\lambda_1^2 > 0,\ \lambda_2^2 > 0,\ ..., \lambda_n^2 > 0.$

So the Eigen values of A^2 are all positive.

Thus, A^2 $\boxed{\text{is also positive definite}}$.

Step-2

It is known that if $\lambda_1, \lambda_2, ..., \lambda_n$ are Eigen values of A, then $\frac{1}{\lambda_1}, \frac{1}{\lambda_2}, ..., \frac{1}{\lambda_n}$ are Eigen values of A^{-1}.

Clearly, $\frac{1}{\lambda_1} > 0,\ \frac{1}{\lambda_2} > 0,\ ..., \frac{1}{\lambda_n} > 0.$

So the Eigen values of A^{-1} are also positive.

Hence, the matrix A^{-1} $\boxed{\text{is also positive definite}}$.