[AB] $\perp$ [DE] (Given)

Then, $\overset{\frown}{AE} = 90°$ (Arc formed by perpendicular diameters)

Hence, $A\hat{C}E = \frac{90°}{2}$

$\therefore \boxed{A\hat{C}E = 45°}$

$A\hat{C}B = 90°$ (proved)

$A\hat{C}E = 45°$ (proved)

$\therefore$ [CE) is the interior bisector of $A\hat{C}B$.

* [ED] is a diameter of (C) (Given)

C is a point on (C) (Given)

Then, $E\hat{C}D = 90°$ (Angle facing diameter).

but [CE) is interior bisector of $A\hat{C}B$ (proved)

$\therefore$ [CD] is the exterior bisector of $A\hat{C}B$ (Interior & exterior bisector are perpendicular)

4) a- $C\hat{E}D = 90°$ (proved)

Then, (EC) $\perp$ (CD)

F is the orthogonal projection of B on (CD) (Given)

Then, (BF) $\perp$ (CD)

$\therefore$ (EC) // (BF) (Two st. lines perp. to same st. line are parallel)

* In $\triangle BCF$ we have:

[CD) is the exterior bisector of $A\hat{C}B$ (proved)

And, $A\hat{C}B = 90°$ (proved)

Then, $B\hat{C}D = 45°$ (property of a bisector)

But, (BF) $\perp$ (CD) (proved)

Then, $B\hat{F}C = 90°$

$\therefore$ $\triangle BCF$ is a right isosceles at F (having a 90° & 45° angles)