

Section-2

Ans 1) Momentum theory - Aerodynamics is the branch of science which deals with all and gases in motion and their Mechanical effect.

② $V =$ Impinging wind velocity

$V_f =$ Wind velocity in Plane

$V_R =$ Resultant wind velocity

$F_L =$ Lift Force

$F_D =$ Drag Force

$F_R =$ Resultant Force.

$F_T =$ Component of F_R Producing torque

$F_{th} =$ thrust force

$\alpha =$ Angle of Attack

$\beta =$ Pitch angle

③ Blade is moving in the plane of rotation and it sees a tangential wind velocity V_T in the plane

④ V_R is the resulting wind velocity which is the vector sum tangential velocity V_T

⑤ The vector sum of Lift force F_L power output from wind Machine

$$\text{Power Coeff.} = \frac{\text{power output from wind Machine}}{\text{power available in wind}}$$

$$\text{axial force on turbine } F = \frac{\pi}{8} \rho V^2 (V_L^2 - V_e^2)$$