

PERFORMANCE CHARACTERISTIC CURVES OF TURBINES

INTRODUCTION

- Designed conditions of turbine -
- Hydraulic Turbines gives their best performance when they are operated at certain conditions of head, discharge, speed and output power.
- Model turbines are tested under different conditions of head, discharge, speed, power, efficiency. Results are plotted in the form of curves and are known as **performance characteristic curves**.
- For convenience, curves are plotted in terms of unit quantities.

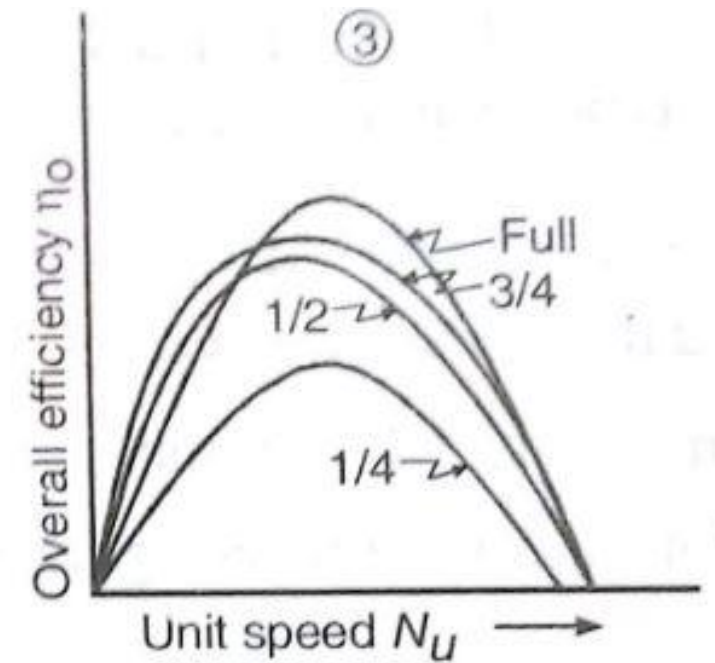
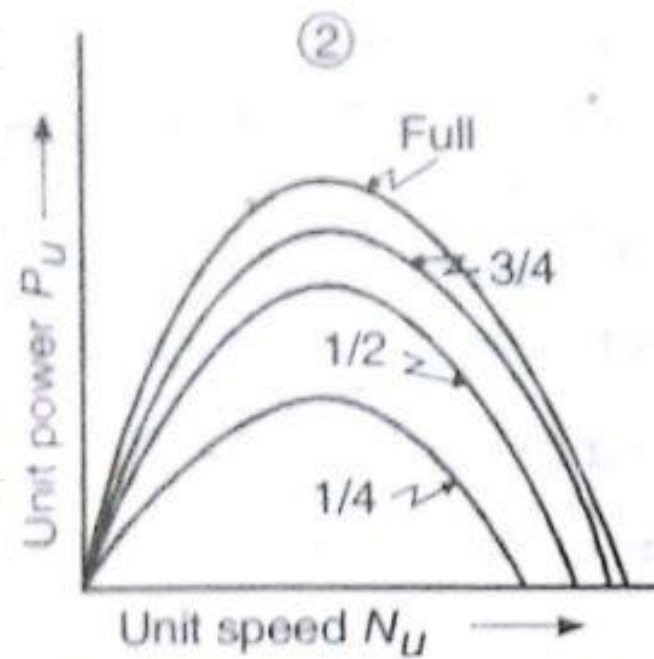
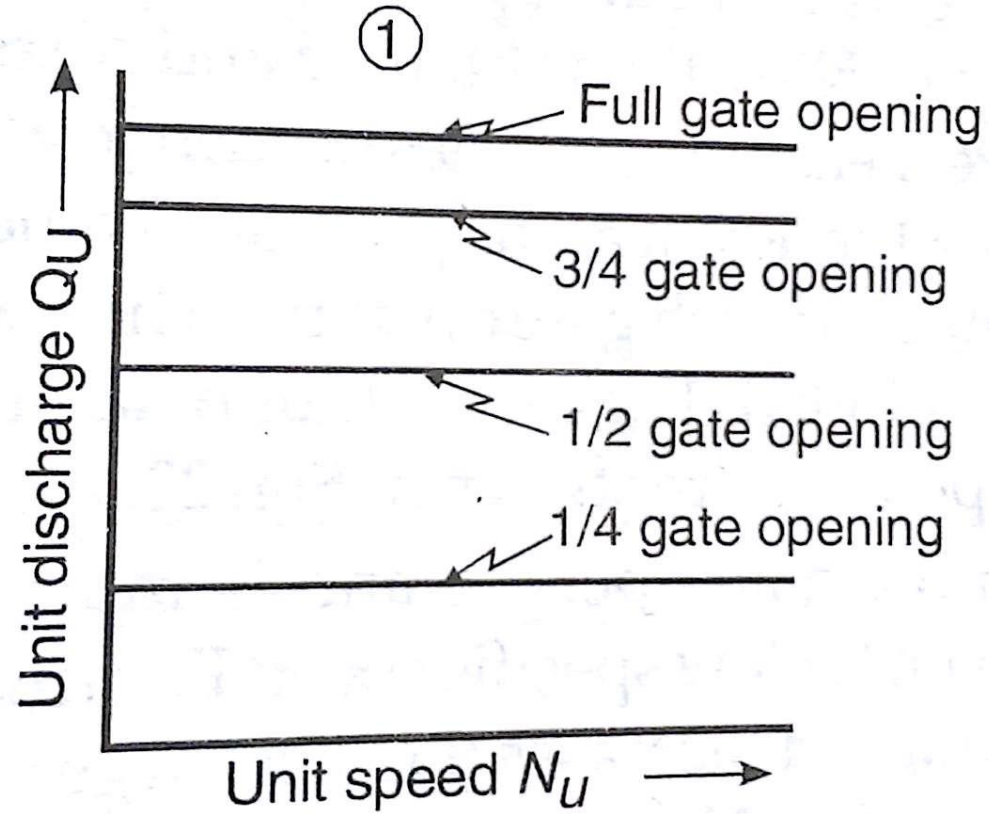
Types of PC curves

- Main Characteristic curves / Constant head curves
- Operating characteristic curves / Constant Speed curves
- Constant efficiency curves (Muschel Curves)

Main Characteristic curves/ Constant head curves

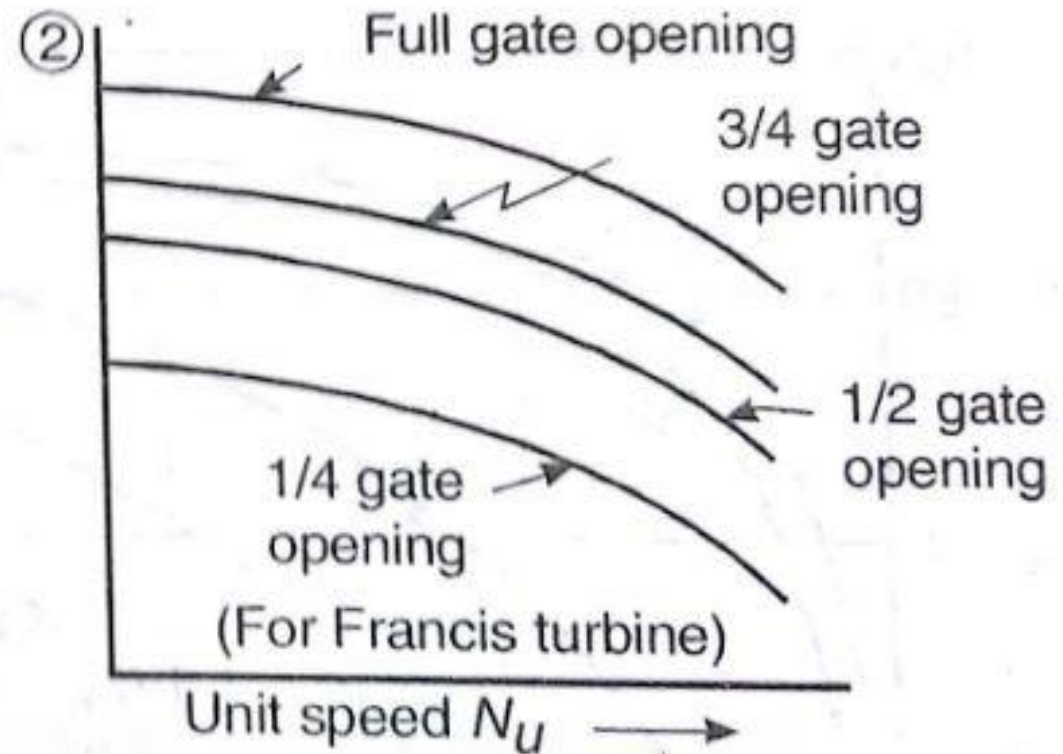
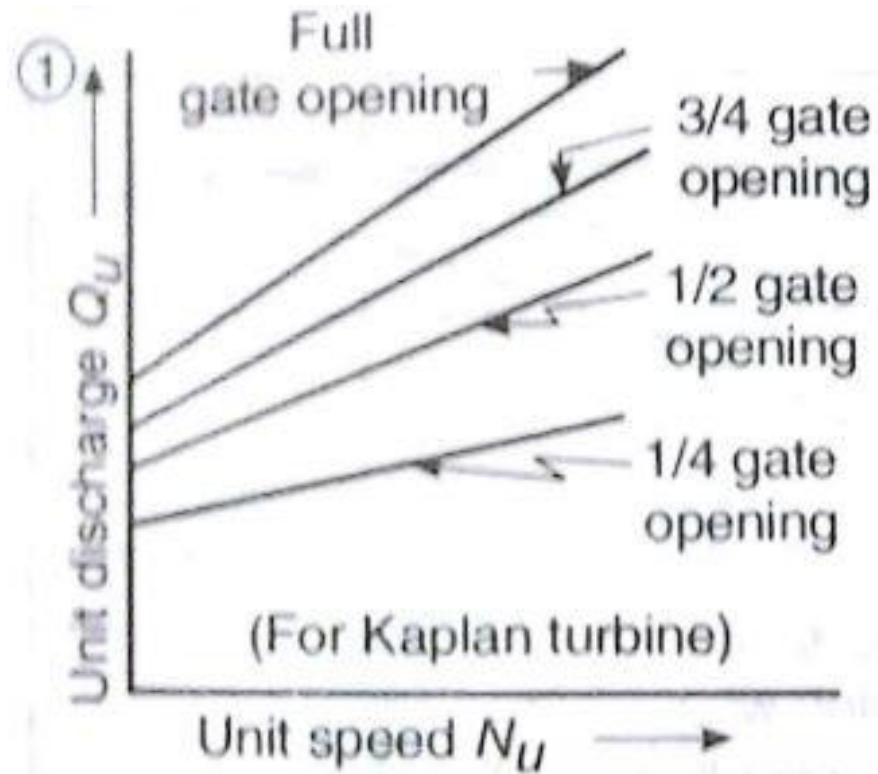
- Curves are drawn by conducting experiment at constant head.
- Head and gate openings are kept constant and speed is varied by varying load on the turbine.
- For each value of speed, corresponding values of power and discharge are obtained.

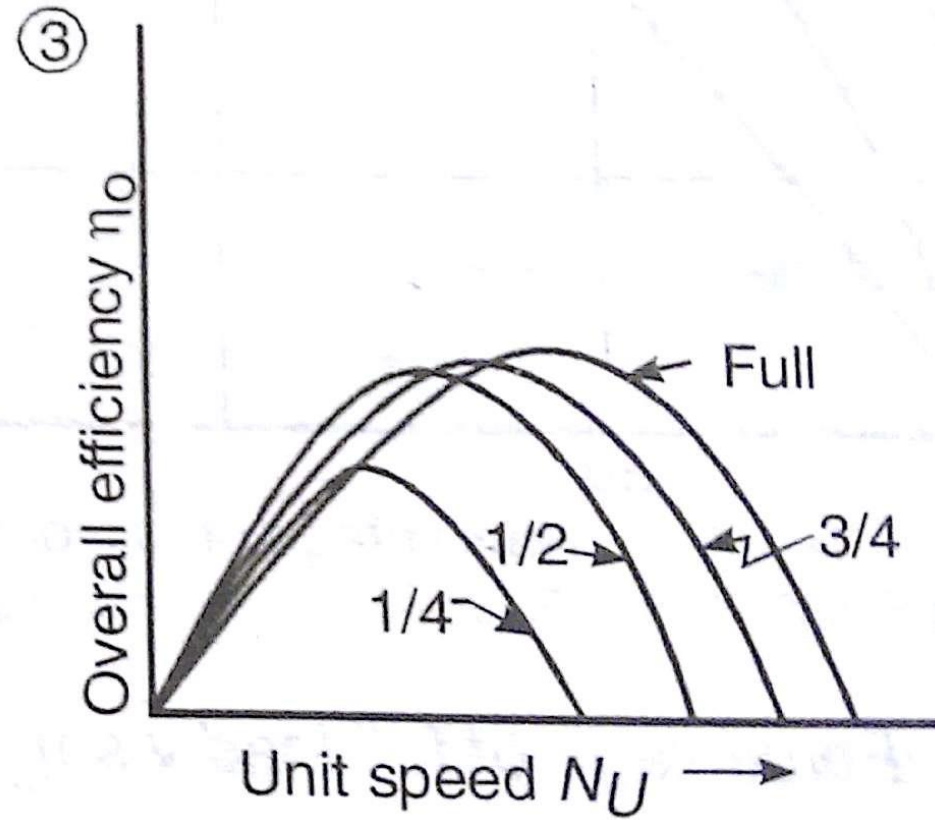
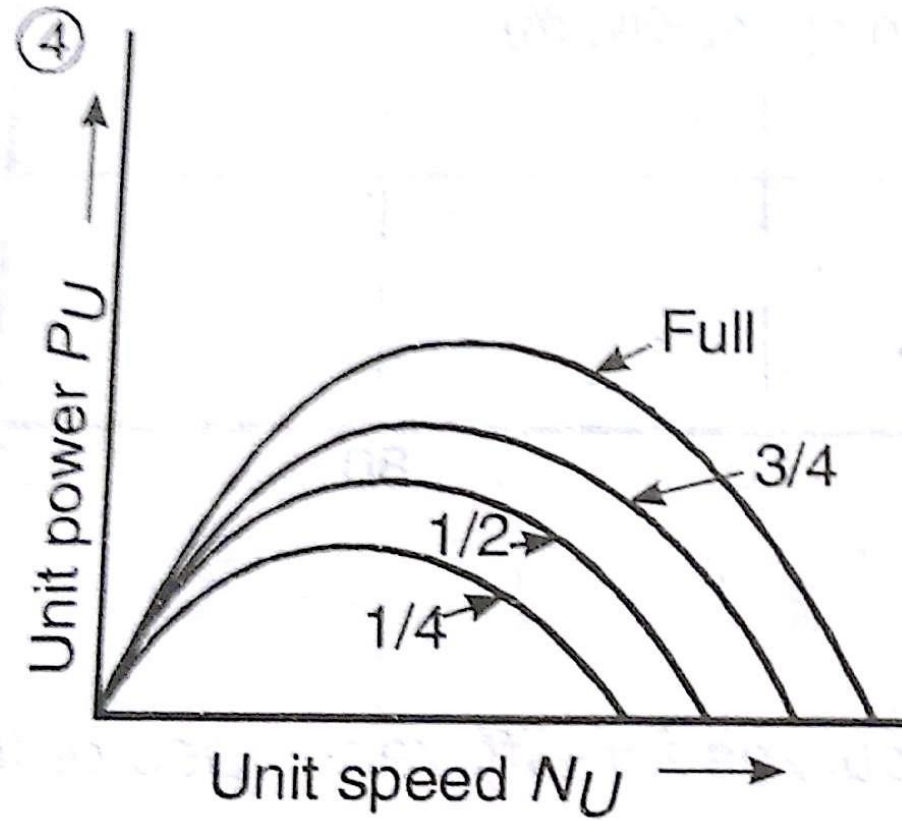
For Pelton wheel



(a) For pelton wheel

For Reaction turbines

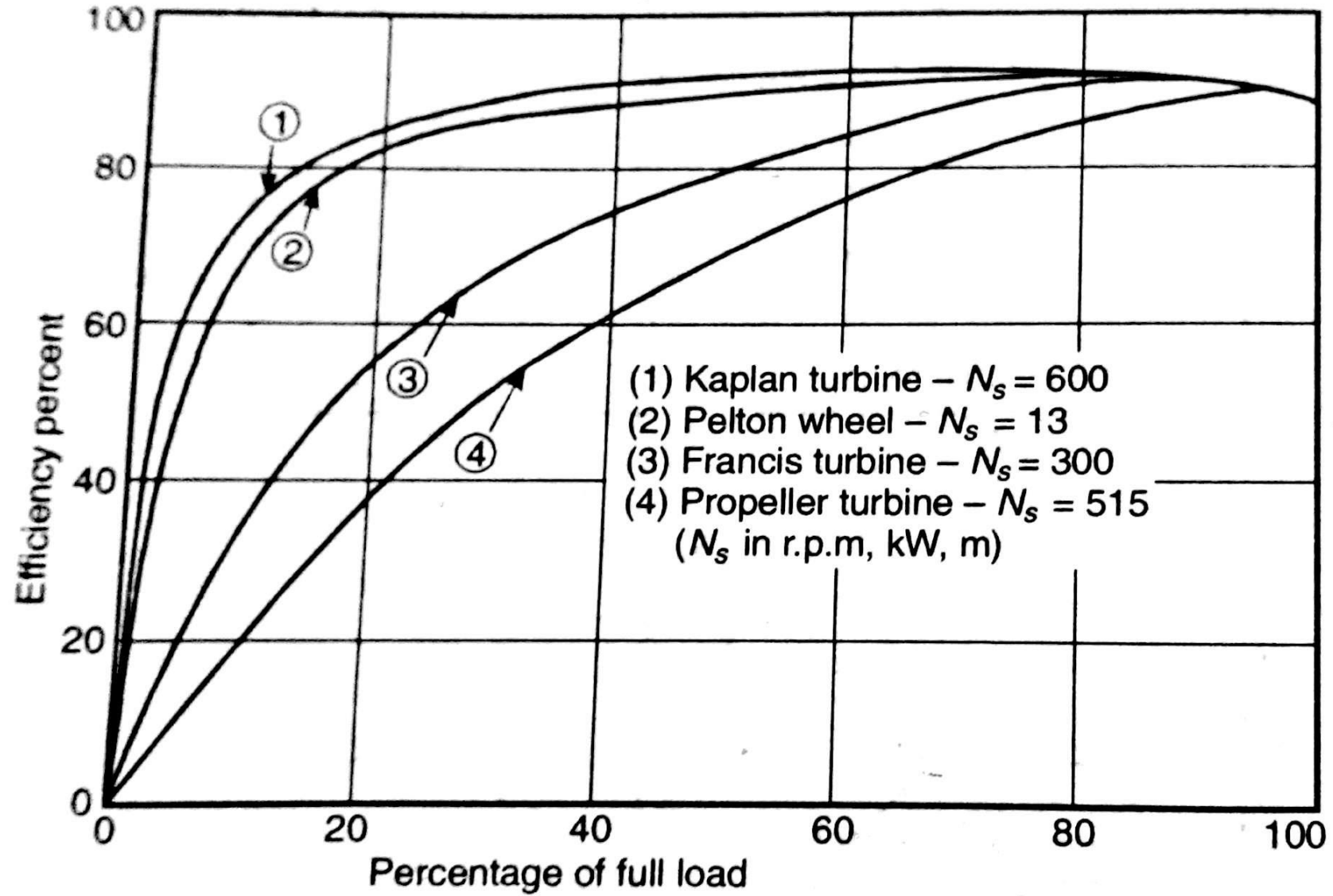


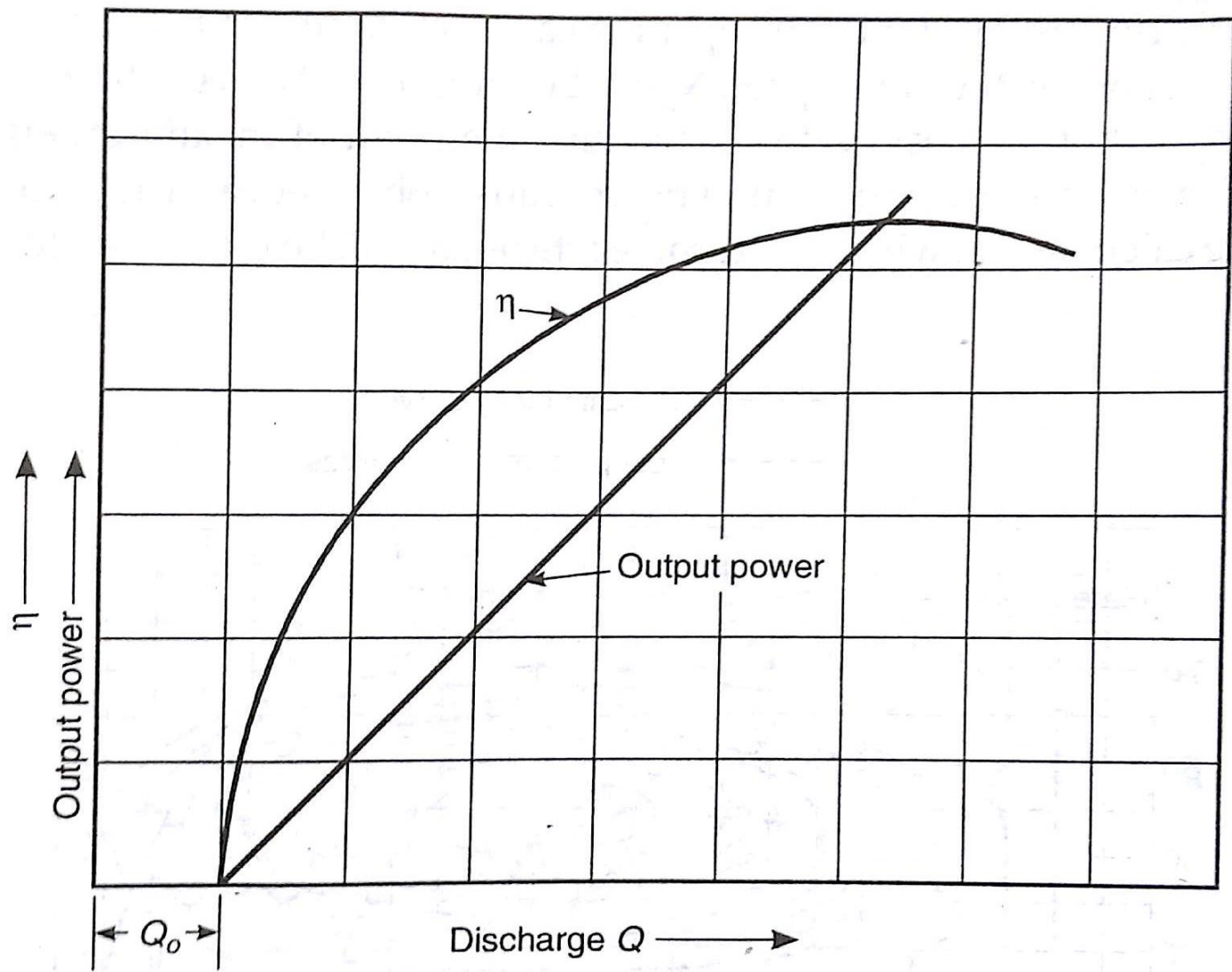


(b) For reaction turbine

OPERATING CHARACTERISTIC CURVES / Const. Speed curves

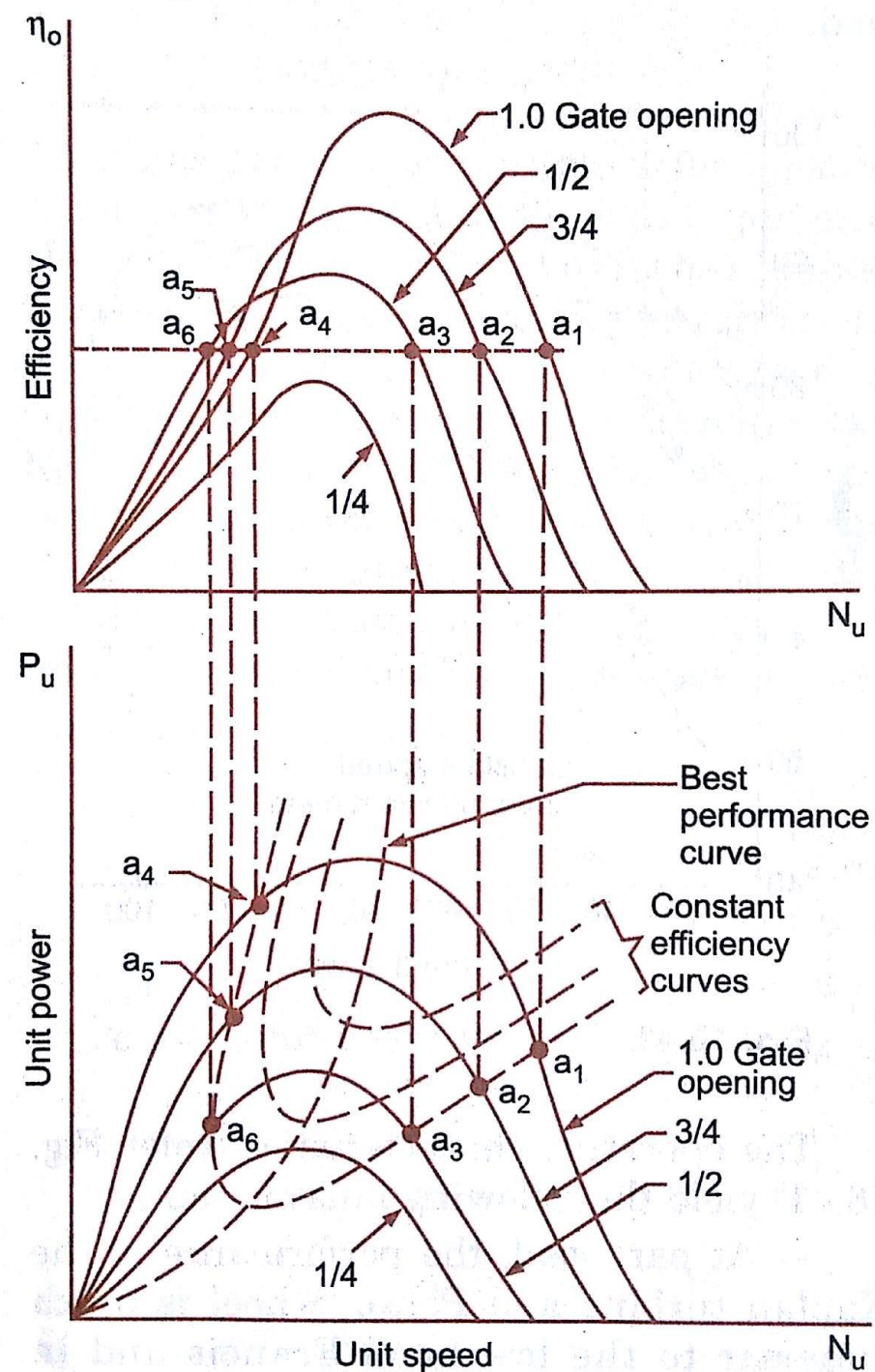
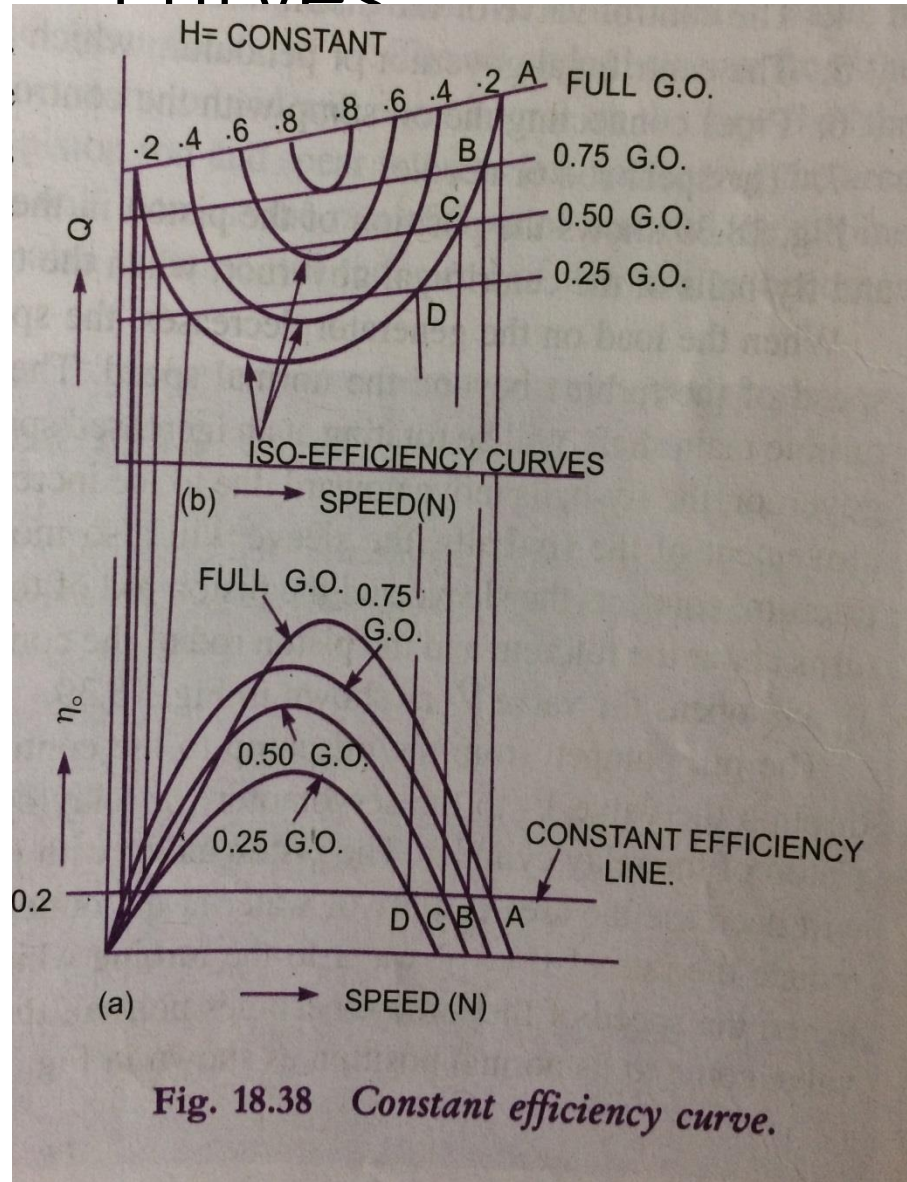
- Tests are performed at constant speed.
- Const. speed is attained by regulating the gate opening thereby varying the discharge flowing through the turbine as the load varies.
- Head may or may not be kept constant.





Constant Efficiency

CURVES



Surge Tank

- a tank connected to a pipe carrying a liquid and intended to neutralize sudden changes of pressure in the flow by filling when the pressure increases and emptying when it drops.

Surge Tank

