

50037



- b) The power required by an impeller in a tunnel is a function of the following variables :
- Diameter of the agitator
 - Number of rotations of the impeller per unit time
 - Viscosity of fluid
 - Density of fluid
 - From dimensional analysis using Buckingham's method, obtain a relation between power and the four variables. (8)
 - The power consumption is found experimentally to be proportional to the square of the speed of rotation. By what factor would the power be expected to increase if the impeller diameter was doubled ? (8)
12. a) Explain the operation of the intermittent type supersonic wind tunnel with neat sketches and explain the importance of the second throat.
(OR)
- Explain the special problems in testing of models transonic wind tunnel. (6)
 - Explain the transonic wind tunnel with neat sketches. (10)
13. a) Explain in detail, the blockage corrections in closed circuit wind-tunnels for the wind tunnel calibrations.
(OR)
- b) Draw a sketch of three dimensional flow direction probes and explain its use in the calibration of flow direction in the wind tunnels.
14. a) Explain modern three component balance for force and moment measurements in wind tunnel with neat sketches.
(OR)
- b) Explain with neat sketches of the multichannel pressure measurements with scanners for pressure measurements over an airfoil with 20 No. of ports distributed equally on the surface.
15. a) Explain the procedure involved in the unsteady pressure measurements over an airfoil draw the $C_{p_{mean}}$, $C_{p_{rms}}$ profiles over NACA 4412 airfoil at an angle of attack of 15 degrees.
(OR)
- b) Explain the low speed wind tunnel design procedure with empirical equations and draw the wind tunnel model.