

Fluid Mechanics and Machinery (313309)

Most repeated questions — MSBTE K-scheme papers S-2026, W-2025, S-2025, W-2024

How to read: **Asked in** shows the MSBTE papers where the same question came (same idea, any wording).

High = came in 3 or 4 of the 4 papers, **Medium** = 2 papers, **Low** = 1 paper. Prepare High ones first. Paper pattern seen in all four papers: Q.1 any 5 of 7 (2 M), Q.2 & Q.3 any 3 of 4 (4 M), Q.4 any 3 of 5 (4 M), Q.5 & Q.6 any 2 of 3 (6 M) — 70 marks, 3 hours.

Top questions (came in all 4 papers)

1. Water hammer — phenomenon, causes, effects and remedial measures (2/4 marks)
2. Impact of jet — force / work done / efficiency on flat or curved plate, fixed or moving (numerical) (4/6 marks)
3. Draft tube — function / need and types (2/4 marks)
4. Pelton wheel numerical — power, hydraulic & overall efficiency, specific speed, design (D, d, jets) (6 marks)
5. Centrifugal pump numerical — vane angle, work done, manometric / mechanical / overall efficiency, power (4/6 marks)

Unit I — Properties of fluid and fluid pressure

Question / topic	Marks	Asked in	Probability
Pressure head / unit conversion numerical (kerosene & CCl ₄ head, psi–kgf/cm ² –bar to N/m ² , composite liquid column)	4/6	S-26, W-25, S-25 (3/4)	High
Total pressure and centre of pressure on vertical circular plate (numerical)	4	S-26, S-25, W-24 (3/4)	High
Manometers — differential U-tube (explain / numerical), simple U-tube vacuum numerical	4/6	S-26, W-25, W-24 (3/4)	High
Bourdon tube pressure gauge — construction & working with sketch / compare with manometers	4	W-25, S-25, W-24 (3/4)	High
Define fluid properties: surface tension, kinematic viscosity, capillarity, vapour pressure	2	S-26, S-25 (2/4)	Medium
Specific gravity / weight of liquid numerical (e.g. 1 litre weighs 7.8 N; density 2900 kg/m ³)	2	W-25, W-24 (2/4)	Medium
Pascal's law (state)	2	S-25 (1/4)	Low
Surface tension — pressure inside a water droplet (numerical)	2	S-25 (1/4)	Low
Atmospheric, gauge and vacuum pressure with sketch	4	W-24 (1/4)	Low

Unit II — Fluid flow and flow measurement

Question / topic	Marks	Asked in	Probability
Types of fluid flow — define steady/unsteady, uniform, laminar/turbulent, rotational; identify laminar/turbulent	2/4	S-26, W-25, S-25 (3/4)	High
Bernoulli's theorem — state / explain with sketch and assumptions	2/4	S-26, W-25, S-25 (3/4)	High
Venturimeter — construction & working / numerical (discharge, throat dia, pressure difference)	4	S-26, W-25, W-24 (3/4)	High
Orifice meter numerical (discharge)	4	S-26, S-25 (2/4)	Medium
Pitot tube — construction and working with sketch	4	W-25, W-24 (2/4)	Medium
Energies possessed by a flowing fluid	4	S-25 (1/4)	Low
Continuity equation — state and expression	2	W-24 (1/4)	Low
Hydraulic coefficients C_d , C_v , C_c and relation	4	W-24 (1/4)	Low

Unit III — Flow through pipes

Question / topic	Marks	Asked in	Probability
Water hammer — phenomenon, causes, effects and remedial measures	2/4	S-26, W-25, S-25, W-24 (4/4)	High
Laws of fluid friction for laminar / turbulent flow	2/4	S-26, S-25, W-24 (3/4)	High
Hydraulic gradient line and total energy line with sketch	2/4	S-26, W-25, W-24 (3/4)	High
Power transmission through pipe — maximum power / diameter and efficiency (numerical)	4/6	W-25, S-25, W-24 (3/4)	High
Size of supply pipe from head loss (Darcy, numerical)	4	S-26 (1/4)	Low
Minor losses in pipes — meaning, list with formulae	4	W-25 (1/4)	Low

Unit IV — Impact of jet and hydraulic turbines

Question / topic	Marks	Asked in	Probability
Impact of jet — force / work done / efficiency on flat or curved plate, fixed or moving (numerical)	4/6	S-26, W-25, S-25, W-24 (4/4)	High
Draft tube — function / need and types	2/4	S-26, W-25, S-25, W-24 (4/4)	High
Pelton wheel numerical — power, hydraulic & overall efficiency, specific speed, design (D , d , jets)	6	S-26, W-25, S-25, W-24 (4/4)	High
Classification / selection of turbines (name turbine for given head & discharge, factors for selection)	2/4	S-26, W-25, W-24 (3/4)	High

Performance characteristic curves of hydraulic turbines (Pelton / general)	6	S-26, W-25, W-24 (3/4)	High
Derive / write force on moving flat vertical plate	2/4	S-26, S-25 (2/4)	Medium
Compare impulse vs reaction turbine / Francis vs Kaplan	4/6	W-25, S-25 (2/4)	Medium
Layout of hydro-electric power plant	4	S-26, W-25 (2/4)	Medium
Turbine efficiencies (hydraulic, mechanical) — define	2	S-25 (1/4)	Low
Cavitation in turbines	4	S-25 (1/4)	Low
Surge tank — need	2	W-24 (1/4)	Low
Kaplan turbine — construction, working and velocity diagram	6	W-24 (1/4)	Low

Unit V — Pumps (centrifugal and reciprocating)

Question / topic	Marks	Asked in	Probability
Centrifugal pump numerical — vane angle, work done, manometric / mechanical / overall efficiency, power	4/6	S-26, W-25, S-25, W-24 (4/4)	High
Reciprocating pump — components, working of single / double acting, comparison	2/4	W-25, S-25, W-24 (3/4)	High
Indicator diagram of reciprocating pump — effect of acceleration and friction	2/6	S-26, W-25, S-25 (3/4)	High
Air vessel — use / sketch and advantages	2/4	W-25, W-24 (2/4)	Medium
Priming of centrifugal pump — need / methods	2	S-26, W-25 (2/4)	Medium
Faults in centrifugal pump — causes and remedies	4/6	S-25, W-24 (2/4)	Medium
Multistage centrifugal pumps — construction, advantages, applications	4/6	W-25, W-24 (2/4)	Medium
NPSH — define	2	W-24 (1/4)	Low
Characteristic curves of centrifugal pump	4	S-26 (1/4)	Low
Types of impellers and casings	4	S-26 (1/4)	Low
Factors for selection of pump	4	S-26 (1/4)	Low

Note: Based on MSBTE papers S-2024...S-2026 available on msbte.ac.in (K-scheme papers found: W-2024, S-2025, W-2025, S-2026). Practice guidance only — not a prediction of the exam. This is prepared by Ananda Technologies and is not an official MSBTE document. Study the full syllabus. Free for students — anandatechnologies.in