Question

Summary between fluid static and kinematic of fluid

FLUID STATICS

SUMMARY

✓Fluid statics is a field of fluid mechanics that studies the behaviour of fluids when they are at rest.

✓It includes investigating the pressure fluids exert and the forces they experience when not moving.

✓ Pascal’s Law states that a fluid transmits pressure equally in all directions, and the hydrostatic equation, which connects a fluid’s pressure to its depth and gravity acceleration, are two important concepts in fluid statics.

✓Fluid statics is an important field of study with numerous applications in various fields such as hydraulic systems, civil engineering, aerospace engineering, biomedical engineering, environmental engineering, and marine engineering.

✓It is used to design and analyze systems that involve the transmission of force and energy using fluid power, as well as to study the movement of fluids in the environment and blood flow in the human body.

✓Fluid statics principles are also used to calculate the buoyancy of objects in fluids and to analyze the stability of structures subjected to hydrostatic loads.

✓Fluids are not only liquids but also gasses, which can flow and are termed as Fluids.

✓The Fluid Statics deals with the intensity of pressure, mass, friction between fluid molecules.

✓Depending on pressure measurement, Fluid Statics refers to the calculation of pressure at any point, which remains the same.

✓On the other hand, it describes the pressure at the vessel wall which is perpendicular. ✓Fluid Statics explains the mathematical measurement of substances.

✓An object remains stable when “an angular displacement moves the margin of action of an upward buoyant force acts through the center of buoyancy.

✓Static fluid refers to the fact that there is no motion in the fluid, which has equal pressure from every direction, and it only responds through an accelerating force, depending on the depth.

✓Due to the pressure changes, the friction between the molecules has been seen, these differences are dealt with by the fluid statics.

✓ It helps to measure the pressure with hydrostatics, floating or submerged ships or submarines, water reservoirs and gates, and liquid storage substances.

KINEMATIC OF FLUIDS

SUMMARY

✓Kinematics is the study of the motion of points, objects, and groups of objects without considering the causes of its motion.

✓This deals with the geometry of motion of fluid particles.

✓This also deals with the velocity and acceleration of fluid particles in motion.

✓The motion of a fluid can be analysed on the same principles as those applied in the motion of a solid.

✓When a fluid is in motion there are many stream lines and these stream lines indicate the flow pattern at that particular instant.

✓To describe motion, kinematics studies the trajectories of points, lines and other geometric objects, as well as their differential properties (such as velocity and acceleration).

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✓Kinematic equations can be used to calculate the trajectory of particles or objects.

✓In order to describe an object’s motion, you need to specify its position relative to a convenient reference frame.