

SYLLABUS FOR TAMILNADU COMMON ENTRANCE TEST (TANCET)

PART – III

7. AERONAUTICAL AND AEROSPACE ENGINEERING

Fluid Flow Equations – Incompressible Viscous and Inviscid flows – Dimensional analysis – Fluid Machinery – Basic concepts in thermodynamics – Basics of propulsion and heat transfer – Air standard cycles – Properties of pure substance – Stresses in beams – Deflection of beams – Torsion – springs and columns – Biaxial stress system – Statically determinate and indeterminate structures – Energy methods – Failure theories- Induced stresses Basic aspects of boundary layer theory – Flow through compressors, combustion chambers, gas turbines and nozzles of gas turbine engines – Unsymmetrical bending – Shear flow in open and closed sections – Buckling of plates and stress analysis – Fundamentals of computational fluid dynamics – Grid generation – Time dependent methods and finite volume methods-finite element methods – discrete. Continuum and isoparametric elements – Field problem and method of solutions – composite materials.

Basics of flight mechanics – Aircraft configurations – Airplane structures – Airplane power plants – Airplane control systems – Aircraft instruments – Aircraft engine, air conditioning and pressurization system – Airfoil theory – Subsonic wing theory – Steady level flight, gliding and climbing flight and accelerated flight of airplanes – Fundamentals of hypersonic air breathing and rocket propulsion systems – Stability and control of airplanes – Fundamentals of supersonic flows – High speed flows over airfoils, wings and airplanes – Experimental techniques for high speed flows.