Course: Aircraft systems and Instruments   Semester: VI
Program: B-Tech (ASEA)
Time: 03 hrs.   Max. Marks: 100

Instructions: Note: Make use of *sketches/plots* to elaborate your answer. Brief and to the point answers are expected. The Question Paper contain 3 Sections- Section A, B and C

SECTION A			
S. No.	All questions are compulsory	Marks	CO
Q 1	Define Weeping wing. Which type of de-icing systems are used for stall- warning sensors.	4	CO4
Q 2	State the significance of DART. Compare different aircraft Refrigeration System based at different Mach Number	4	CO4
Q 3	Discuss various types of Engine Instruments used in aircraft.	4	CO5
Q 4	Define TAS, EAS and CAS.	4	CO5
Q 5	Illustrate principle of Airspeed Indicator with necessary sketch.	4	CO5
SECTION B			
Q 6	Discuss aircraft control system.(a)Explain primary and Secondary control surface using diagram.(b) Differentiate open-loop and closed -loop control system	10	CO1
Q 7	Illustrate working of hydraulic system for light aircraft. Write applications of hydraulic power (b) Categorize fuel tanks on basis of aircraft. OR Categorize types of Emergency Extension system. Explain, working of aircraft retraction system with necessary diagram	10	CO2
Q 8	Relate principle and working of dual magneto ignition system with necessary circuit diagram.	10	CO3
Q 9	Steam at 100Kpa & 280K steadily enters a nozzle whose inlet area is 1.5m^2. The mass flow rate of steam through nozzle is 0.02kg/s. steam leaves the nozzle at 600Kpa with a velocity of 50m/s. Heat losses from the nozzle per unit mass of the steam are estimated to be 16KJ/kg. Specific volume and enthalpy at nozzle inlet are 0.164m^3/kg and 3214.4KJ/kg. Determine (a) Inlet Velocity (b) The exit temperature of the steam.(Assume K.E , P.E negligible)	10	CO4

	SECTION-C		
Q 10	(a)Differentiate Brayton cycle and reverse Brayton cycle with necessary P-V and T-S Diagram. (b) Draw P-V and T-S Diagram of Vapor compression Refrigeration cycle. Define Saturated liquid, superheated Vapor and saturated Vapor. OR (a) Compute COP of Reverse Brayton Cycle. COP $=\{[rp^{\gamma-1/\gamma}]-1\}^{-1}$ (b) Discuss Thermo-couple fire warning system with necessary circuit diagram.	20	CO4
Q11	(a)Explain working principle of Pitot static Instrument and Write its application in aircrafts. (b)Discuss principle and working of Altimeter with necessary sketch.	20	CO5