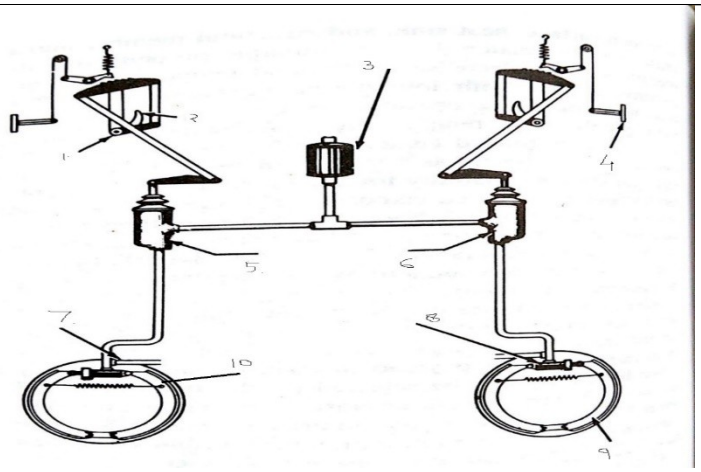
Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Aircraft system& Maintenance(ASEG344) **Semester: V**
Programme: B-Tech ASE
Time: 03 hrs. **Max. Marks: 100**
Instructions: Make use of *sketches/plots* to elaborate your answer. The Question Paper contain 3 Sections- Section A, B and C

SECTION A (5 x 4 = 20 Marks)

S. No.		Marks	CO
Q 1	Draw temperature Vs moisture content of Indirect Evaporative cooling system.	**5**	**CO3**
Q 2.	Write a short note on additives and inhibitors used in Jet fuels.	**5**	**CO3**
Q 3.	What is the function of VOR? Explain with suitable sketch.	**5**	**CO1**
Q 4.	What do you understand by line and base Maintenance?	**5**	**CO4**
SECTION B (10 x 4 = 40 Marks)			
Q 5.	Draw circuit diagram of Magneto-Ignition system along with working and application in aircraft.	**10**	**CO3**
Q 6.	How Inspection of Aircraft and its components done. Write Types of Inspection.	**10**	**CO4**
Q 7.	Distinguish aircraft Hydraulic system and pneumatic System with necessary sketches OR Write function of any "Five" components of Aircraft brake system and label all components.	**10**	**CO2**

			
Q 8.	Elaborate, communication and Navigation systems used in aircraft with neat sketch	**10**	**CO1**
	SECTION-C(20 x 2 = 40 Marks)		
Q 9.	a) Differentiate vapor-Compression Refrigeration cycle and bootstrap cycle with Schematic diagram. b) Draw P-V and T-S Diagram of Vapor compression Refrigeration cycle. Define Saturated liquid, superheated Vapor and saturated Vapor. **c)** Compute COP of Reverse Brayton Cycle. COP $=\{\left(rp^{\gamma-1/\gamma}\right)-1\}^{-1}$ d) Discuss anti-icing Techniques used for propellers, fuel vents. OR a) 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) b) Air at 100 KPa and 20OK compressed steadily to 560KPa and 350 K. The mass flow rate of the air is 0.02 kg/s, and a heat loss of 16KJ/Kg occurs during process. Assuming the changes in K.E and P.E are negligible, determine the necessary power input to the compressor. $H_1 = h_{@200k} = 280KJ/Kg$, $H_2 = h_{@350k} = 400KJ/Kg$	**20**	**CO3**
10.	a) Enumerate types of Ignition systems used in aircrafts with necessary sketch. b) Relate principle and working of dual- magneto Ignition system c) Sketch and explain circuit diagram of dual-Magneto Ignition system. d) Write examples of starting and ignition system used in piston and Jet Engines.	**20**	**CO2**

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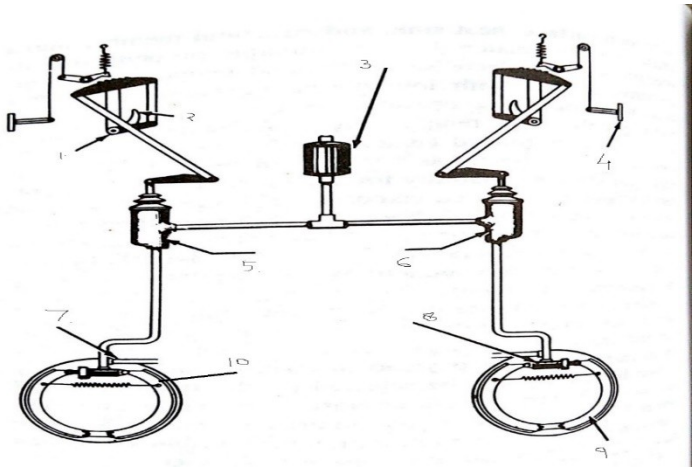
SECTION A (5 x 4 = 20 Marks)

S. No.		Marks	CO
Q 1	Draw ILS Indicator marking with its components and write function of each component.	**5**	**CO1**
Q 2.	Differentiate Indirect and Direct Evaporative cooling system.	**5**	**CO3**
Q 3.	Define Weeping wing. Which type of de-icing systems are used for stall- warning sensors.	**5**	**CO3**
Q 4.	What do you understand by primary and zonal inspections?	**5**	**CO4**
	SECTION B (10 x 4 = 40 Marks)		
Q 5.	Write difference between gravity feed fuel system and pressure feed fuel system.	**10**	**CO3**
Q 6.	Elaborate, communication and Navigation systems used in aircraft with neat diagram.	**10**	**CO1**
Q 7.	Label components of aircraft brake system and write its function.  OR	**10**	**CO2**

	Describe the working of Aircraft Pneumatic power system with neat diagram.		
Q 8.	What are scheduled and unscheduled maintenance practices carried out in an aircraft industry?	**10**	**CO4**
SECTION-C(20 x 2 = 40 Marks)			
Q 9.	a) Differentiate Bell-colemon cycle and brayton cycle with Schematic diagram. b) Draw P-V and T-S Diagram of Bell-colemon cycle. Define Saturated liquid, superheated Vapor and saturated Vapor. **c)** Compute COP of Bell-colemon cycle. COP $=\{\left(rp^{\gamma-1/\gamma}\right)-1\}^{-1}$ OR a) Steam at 100Kpa & 260K steadily enters a nozzle whose inlet area is $2.5m^2$. The mass flow rate of steam through nozzle is 0.01kg/s. steam leaves the nozzle at 500Kpa with a velocity of 40m/s. Heat losses from the nozzle per unit mass of the steam are estimated to be 18KJ/kg. Specific volume and enthalpy at nozzle inlet are $0.160m^3$/kg and 3200.4KJ/kg. Determine (a) Inlet Velocity (b) The exit temperature of the steam.(Assume K.E , P.E negligible) b) Air at 100 KPa and 220K compressed steadily to 560KPa and 330 K. The mass flow rate of the air is 0.01 kg/s, and a heat loss of 18KJ/Kg occurs during process. Assuming the changes in K.E and P.E are negligible, determine the necessary power input to the compressor. $H_1 = h_{@200k} = 280KJ/Kg$, $H_2 = h_{@350k} = 400KJ/Kg$	**20**	**CO3**
10.	a) Enumerate types of Ignition systems used in aircrafts with necessary sketch. b) Relate principle and working of dual- magneto Ignition system c) Sketch and explain circuit diagram of dual-Magneto Ignition system. d) Write examples of starting and ignition system used in piston and Jet Engines.	**CO2**	**20**