Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

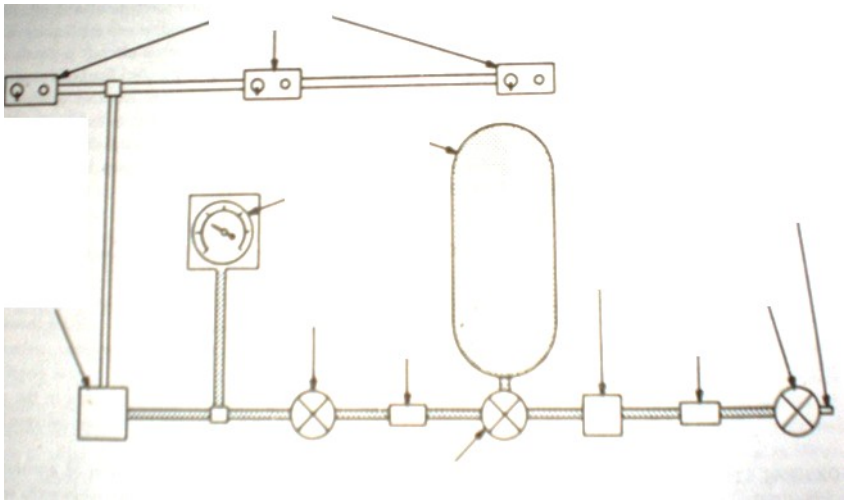
End Semester Examination, December 2018

Programme Name: B.Tech ASE, ASE+AVE **Semester : III**
Course Name : Introduction to Aerospace & Avionics Engineering **Time : 03 hrs**
Course Code : ASEG2001 **Max. Marks : 100**
Nos. of page(s) : 2
Instructions: All questions are compulsory, Make use of sketches wherever required. Internal Choice is Given in Question No. 9 and 11.

SECTION A: Five Questions of Four marks each.

S. No.		Marks	CO
Q 1	What are Hot air balloons ? How they changed the face of the Aeronautical history?	4	CO1
Q2.	Explain the purpose for which aeroplane wings are cambered?	4	CO2
Q3.	Differentiate between air breathing and non-air breathing engines ?	4	CO3
Q4.	Explain the function of spar and Stringers used in wing section ?	4	CO4
Q5.	What are the various frequency bands used in satellite and aircraft communication system?	4	CO5
SECTION B: Five Questions of Eight marks each			
Q6	How can you say that the idea of flying came from viewing the birds? Justify your answer.	10	CO1
Q7	Draw a neat sketch of aircrafts, explain briefly about the function of each component.	10	CO2
Q8	Explain in detail the general category of external loads acts on an conventional aircraft .	10	CO4
Q9.	With neat sketch explain the working of Ram Jet Engine? **Or** With neat sketch explain the working of Scram Jet Engine?	10	CO3
SECTION-C : Two Questions of 20 marks each			
Q10	Explain the components of Turbo prop, Turbo jet and Turbofan engines with help of neat Sketches.	20	CO3
Q11.	Which type of oxygen system is show in below figure? Identify various components arrow	20	C05

marked for the system. Explain function of these components. Compare this system with other type(s) of oxygen system



Or

a) Write the radar equation and the maximum detection range? What equation is similar to radar equation and used in a radio telecommunication link.

b) Explain the Pulse Repetition Frequency and Duty cycle? If the maximum unambiguous range of the Radar system operates is 500Km, the wavelength is (1 decimeter)

Calculate the following: -

i. Pulse Repetition Frequency (PRF)
ii. The maximum unambiguous velocity (m/s)
iii. The beam height (Km), for an elevation angle of 30°, refractive index of 1.5 and slant range of 180Km.

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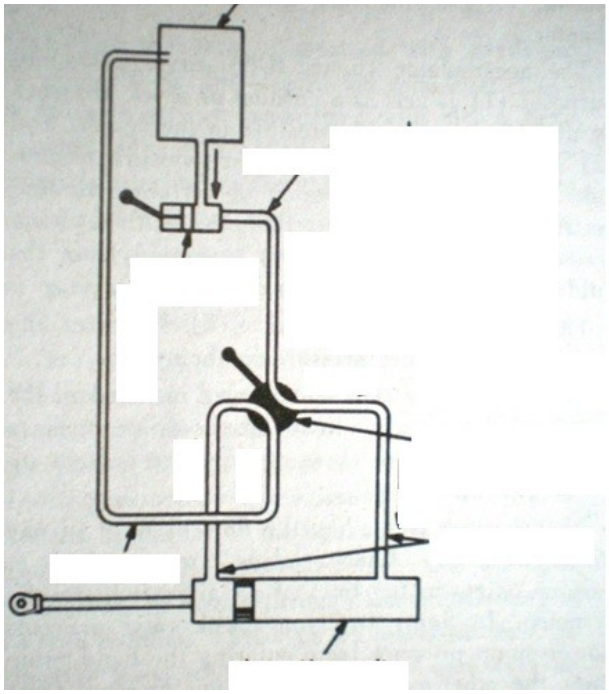
SECTION A: Five Questions of Four marks each.

S. No.		Marks	CO
Q 1	Discuss the earlier types of Flying Machines with the help of neat sketch.	4	CO1
Q2.	What are the Primary and secondary control surfaces used in an Aircraft?	4	CO2
Q3.	Differentiate between axial flow and Centrifugal compressor?	4	CO3
Q4.	Define Limit Load and Ultimate Load on an aircraft.	4	CO4
Q5.	Explain the Doppler Radar? What is the importance of Doppler effects?	4	CO5
	SECTION B: Five Questions of Eight marks each		
Q6	Describe the persons who successful in their early attempts of flying and Explain briefly whether they are successful in their first flight?	10	CO1
Q7	Describe how Newton's laws apply to jet and list two examples of jet engine applications.	10	CO3
Q8	What are the importance of structural weight in Aircraft ? Explain in detail	10	CO4
Q9.	What is meant by high lift devices? Explain the different high lift devices ? Or Why flaps are lowered during take-off and landing of an aircraft ? Explain in detail?	10	CO2
	SECTION-C : Two Questions of 20 marks each		
Q10	With a neat sketch, explain in detail the function of fan blades, bypass ratio, compressor, and Combustion, turbine and Exhaust nozzle for a turbofan engine.	20	CO3
Q11.	Which type of Hydraulic system is show in below figure? Identify various components arrow marked for the system. Explain function of these components. What are the	20	C05

	applications of this system in airplane?  **Or** Explain the military aircraft data buses of MIL STD 1553 B bus in details and bring out the a) 1553B Bus architecture and Hardware Elements b) Word formats c) Message formats d) Coupling Methods e) Manchester Bi-Phase Encoding		