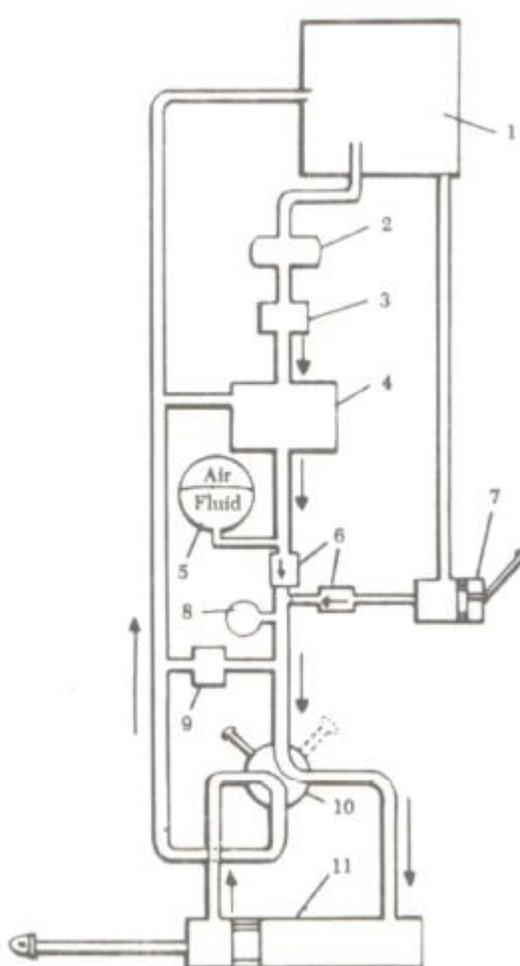


| Name:   |  |  |     |
|---|--|--|-----|
| Enrolment No:   |  |  |     |
| <b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b><br><b>End Semester Examination, May 2023</b>                |  |  |     |
| <b>Course: Aircraft System &amp; Instrument</b><br><b>Program: B.Tech ASE</b><br><b>Course Code: ASEG2010</b> |  | <b>Semester: IV</b><br><b>Time : 03 hrs.</b><br><b>Max. Marks: 100</b>             |     |
| <b>Instructions: All questions are compulsory</b><br><b>Use figures to explain the concept.</b>               |  |  |     |
| <b>SECTION A</b><br><b>(5Qx4M=20Marks)</b>  |  |  |     |
| S. No.  |  | Marks  | CO  |
| Q 1   | What is the significance of a fuel management system in aircraft operations?   | 4  | CO3 |
| Q 2   | What are the advantages of digital fly by wire system over conventional systems?   | 4  | CO1 |
| Q 3   | Explain the working principles of gyroscopic instruments.  | 4  | CO5 |
| Q 4   | How might advancements in aircraft system technology impact the future of aviation?  | 4  | CO6 |
| Q 5   | What is the principle of Evaporative air cycle systems used in aircraft?   | 4  | CO4 |
| <b>SECTION B</b><br><b>(4Qx10M= 40 Marks)</b>   |  |  |     |
| Q 1   | What do you understand by antiicing and deicing problems in aircraft? What are the methods available to provide heated air to the thermal anti-icing system? | 10   | CO3 |
| Q 2   | What is the principle of Air Speed measuring Instrument used in aircraft?<br><b>OR</b><br>Discuss the principle in which the temperature gauges functions.   | 10   | CO5 |
| Q 3   | Explain the working of the different fire detection and smoke detection techniques used in aircraft with neat sketches.                                      | 10   | CO6 |
| Q 4   | How would a pilot use the environmental control system to maintain a comfortable cabin temperature during flight?  | 10   | CO4 |

**SECTION-C**  
**(2Qx20M=40 Marks)**

|     |   |    |     |
|-----|---|----|-----|
| Q 1 | <p>a) How does the fuel system of an aircraft ensure that the engine receives an uninterrupted flow of fuel during flight, and what measures are in place to prevent fuel contamination and system failures?</p> <p>b) Discuss briefly about Pitot Static systems with necessary diagrams.</p>  | 10 | CO2 |
| Q 2 | <p>Identify and explain the control system of following hydraulic system in diagram,</p>  <p align="center"><b>OR</b></p> <p><b>Please read the below article and answer the questions,</b><br/>Instrumentation in aircraft landing gear systems provides pilots with critical information about the position and status of the landing gear during flight. The instrumentation typically includes indicators that display the position of the landing gear, as well as sensors that detect any problems with the system. The landing gear instrumentation is essential for ensuring safe landings and preventing damage to the aircraft.</p> | 20 | CO5 |

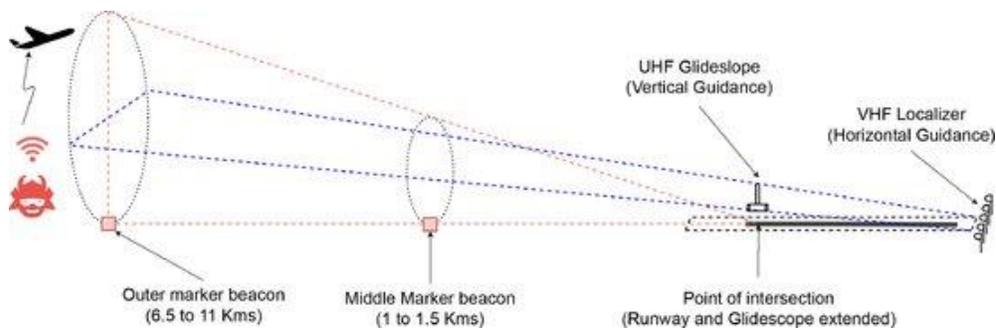


Fig: Architectural diagram of Instrument Landing System. Courtesy  
<https://www.sciencedirect.com/science/article/pii/S0167404821003400?via%3Dihub>

**Questions: [5x4=20]**

- a) How does the pilot use the landing gear instrumentation to ensure safe landings?
- b) Compare and contrast the design and function of the landing gear instrumentation on a commercial airliner versus a military fighter jet.
- c) What types of information do the indicators in an aircraft's landing gear instrumentation provide?
- d) Analyze the role that landing gear instrumentation played in a specific incident or accident involving landing gear malfunction and identify areas where improvements could have been made.