*Seat No.: _____* *Enrolment No._____*

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B.E. Sem-IV Examination June- 2010**

## Subject code: 140103

## Subject Name: Aircraft System and Instruments

**Date: 22 /06 /2010** **Time: 10.30 am – 01.00 pm**

**Total Marks: 70**

## Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain term "power hydraulic". Its application in aircraft. Advantages of application of hydraulic system over mechanical system in aerospace vehicles? Why pneumatic system is also provided in majority of aircraft? | **07** |
| | **(b)** | Describe the balancing of four forces acting on aircraft with diagram. | **07** |
| **Q.2** | **(a)** | Why pressurized reservoirs are used in aircraft? Explain with neat sketch in brief. | **07** |
| | **(b)** | Draw simple sketches of following hydraulic components. Explain in brief their working function and practical application. Any three, i) double acting piston pump, ii) gear pump, iii)heat exchanger, iv)accumulator | **07** |
| | | **OR** | |
| | **(b)** | Compare turboprop, turbo shaft, and turbojet engines in brief. | **07** |
| **Q.3** | **(a)** | Describe in brief the construction features and working principles of centrifugal flow and axial flow compressors. State advantages and disadvantages of both the types of compressors. | **07** |
| | **(b)** | Explain quantitative displays and name instruments in which used. Define precession property of gyroscope. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | What are the types of lubrication systems used in aircraft engine? Explain any one of them with the basic components in brief and specific application. | **07** |
| | **(b)** | With help of figure explain operating principle of Vertical speed Indicator. | **07** |
| **Q.4** | **(a)** | Define Mach number. How (Pt - Ps)/Ps is measured in Mach meter. | **07** |
| | **(b)** | Describe Tachometer (rpm indicator) operation with figure. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Describe aircraft fuel quantity indicator in brief with figure. | **07** |
| | **(b)** | What is aircraft weather warning system? Describe in brief. | **07** |
| **Q.5** | **(a)** | Describe black box recorder of an aircraft in details. | **07** |
| | **(b)** | Describe speed control system in automatic flight system of an aircraft. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain in brief Flight director system in automatic flight system of an aircraft. | **07** |
| | **(b)** | Explain analogue type air data computer with force balance transducer's figure. | **07** |

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