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

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VII Examination-Nov/Dec.-2011

Subject code: 170105 **Date: 29/11/2011**
Subject Name: Advance Avionics
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.**

Q.1 **(a)** In which way Built In Test Equipment (BITE) and Centralized Fault Displays (CFDs) have made maintenance easy? Which are other systems used these days to make maintenance easier? With the help of a diagram explain any Onboard Maintenance System. **07**

(b) Which are different elements setting the Life Cycle Cost of digital avionics? With the help of graph explain how operating cost & investment cost are related to "Mean Time Between Failure (MTBF)". How minimum Life Cycle Cost (LCC) is arrived at? **07**

Q.2 **(a)** Explain TCAS II with the help of block diagram. With the help of a block diagram explain logic of Collision Avoidance System (CAS)? **07**

(b) What is Electronic Warfare? Briefly describe it's elements? What is meant by signature of a radar? How does it help an aircraft by knowing signature of a radar? **07**

OR

(b) Briefly describe MIL-STD-704 establishing aircraft electric power characteristics. With the help of diagram explain voltage and frequency characteristics of any AC/DC power supply system. **07**

Q.3 **(a)** How does Enhanced Ground Proximity Warning System differ from old GPWS? Briefly explain different modes with the help of figures. **07**

(b) Briefly explain the principle of operation of Night Vision Goggle. How cockpit lights are required to be made compatible for Aviator's Night Vision Imaging System (ANVIS) to work satisfactorily? **07**

OR

Q.3 **(a)** How Speech Recognition (SR) is used in aircraft? How does it work? Which are different type of speech Recognizers? What is vocabulary system? Which are different modes of operation for SR? **07**

(b) What is the significance of Human Factors Engineering in designing a flight deck? What is SHEL model? Which characteristics of human being are required to be considered while designing a flight deck? What is meant by usability? **07**

Q.4 **(a)** What are fundamentals of designing avionics system architecture? What are Centralized, Federated, & Distributed architectures? What are their relative advantages and disadvantages? **07**

(b) With the help of diagram explain any fault tolerant system? What is fault tolerant software? Why is it required? **07**

OR

Q.4 **(a)** What is the purpose of DO-178, a document prepared by Radio Technical Commission for Aeronautics, USA and DOD-STD-2167 prepared by Department of Defence, USA. Explain them briefly. **07**

Q.4 **(b)** What for buses are used in digital communication system in aircraft? With the help of diagram explain any bus. **07**

Q.5 **(a)** How are CRTs used as display devices? What are luminous flat panels? What are their advantages over CRT? Explain any luminous flat panel used as display in the cockpit. **07**

(b) On what factors is avionics system design dependent? How does it change with the phase of the flight? What is meant by capability, reliability, maintainability, affordability, accessibility, testability, and reparability? **07**

OR

Q.5 **(a)** What is fault tree? Explain it with the help of a figure. **07**

(b) Write short notes on : **07**
i.Synthetic Vision
ii.ATLAS (Automatic Test Language for All Systems