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**MANIPAL INSTITUTE OF TECHNOLOGY**  
 Manipal University, Manipal – 576 104



**DEPARTMENT OF AERONAUTICAL & AUTOMOBILE ENGINEERING**  
**VI SEM. B.TECH (AERONAUTICAL ENGG.) DEGREE END SEMESTER**  
**EXAMINATIONS MAY. 2016**

**SUBJECT: AVIONICS (AAE-302)**  
**REVISED CREDIT SYSTEM**

Time: 3 Hours.

MAX.MARKS: 50

**Instructions to Candidates:**

- ❖ Answer **ANY FIVE FULL** questions.
- ❖ Missing data, if any, may be suitably assumed.

- 1A) Explain the optical fiber communication in aircraft. (02)
- 1B) Explain the pitch rate command FBW loop with neat diagram. (03)
- 1C) Explain the following (i) Software development process (life cycle) (ii) software validation and verification in the context of fly by wire flight control system. (05)
- 2A) What are the types of BEACON? Briefly explain those. (02)
- 2B) Explain the Air data computation flow diagram. (03)
- 2C) Explain the TLS subsystems? (05)
- 3A) What do you mean by all electric aircraft? List the one advantage and one dis-advantage. (02)
- 3B) Explain the DVI. (03)
- 3C) Explain the following with neat diagram:- (05)
  - (1) Electronic combination of IIT and CRT, (2) an interrogator responder and a ground transponder.
- 4A) Explain the off-axis holographic combiner HUD configuration with neat sketch. (02)
- 4B) What is Dilution of Precision? How is DOP play important role in satellite navigation system? (03)
- 4C) Explain the CW radar with neat diagram. The power output of a VOR Tx Unit is 300 W. The cable attenuation is 5 dB & the antenna gain is 4 dB. (05)

Express the ERP in dBW.

- 5A) What are the differences among IRS, INS and DR. (02)
- 5B) Design the B787 Cockpit Layout (flight deck) with proper nomenclature? (03)
- 5C) How did FMS contributed in improvement of the fuel consumption? (05)  
Design and show the integration of autopilot with FMS.
- 6A) What are differences between the hard and soft failures in sensor? (02)
- 6B) Explain the basic GNSS-INS fusion using Kalman filter. (03)
- 6C) List the 5 communication protocols available in an aircraft. Explain the (05)  
ARINC-429 communication protocol and its cable characteristics.