Code No: 07A72104 **R07** **Set No. 2**

IV B.Tech I Semester Examinations,December 2011
AVIONICS
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain basic principles of operation of the three sigments GPS system.
   (b) What is the signal structure of "NAVSTAR" Satellite Broadcasts and velocity? [8+8]

2. (a) Draw the block- diagram of Amplitude Modulated Radio - Telephony Communication Receiver.
   (b) Explain the function in detail of each block. [8+8]

3. (a) Draw a block diagram to explain primary & secondary Surveillance Radar System.
   (b) Explain various modes of operation including Mode 'C' and 'S' as per ICAO specifications. [8+8]

4. (a) List out various Radio-Radar aids for Navigation of aircraft.
   (b) What is the concept of surival of aircraft by search & Rescue operation? Explain briefly the Radio equipment used for this purpose in the aircraft. [8+8]

5. The 3 types of INS are Local Intertial Platform, Strap Down, and Space Stabilized Platform used for aircraft, missile and spacecraft respectively. Explain these 3 types of INS in detail. Also "Hybrid-Navigation" is the order of the day. Explain about it. [16]

6. How microprocessors and memory devices have affected the development of modern avionic systems? Explain. [16]

7. (a) What factors must be considered while designing a 'Helmet mounted display'?
   (b) Compare and contrast HUD and HMD. [6+10]

8. Draw a schematic Lay-out as an example of state-of-art fighter aircraft modern Avionics architecture integrating various utility Avionic systems by MIL-STD-1553 DATA Bus and explain its function. [16]

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Code No: 07A72104 **R07** **Set No. 4**

IV B.Tech I Semester Examinations,December 2011
AVIONICS
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Compare tradiational electro-mechanical indicators and the electronic instrumentation in aircraft cockpit.
   (b) What do you mean by CRT and HUD? [8+8]
2. There are 3 types of TCAS (Traffic Collision Avoidance System) as used by civil aircraft. Explain. [16]
3. (a) List out advantages and disadvantages of HF Aircraft Audio - Radio Set(SSB version).
   (b) During the technique of modulation in a transmitter power gets distributed. Explain. [8+8]
4. What are ARINC 429 and ARINC 629? Write their merits and demerits, and applications. [16]
5. Write down the various hyperbolic navigation systems. Explain the principle and operation of OMEGA. [16]
6. Air Bus-320/Bocing 777 modern Airliner incorporate Automatic Fligh Control using Fly-By-Wire technology. Explain briefly this concept. [16]
7. Draw the Generic Digital GPS Receiver block-diagram and its function both in C/A and p(r)codes. [16]
8. Differentiate “Analytical Frame of Reference” of Strapped Down INS, “Space Stabilized INS” and “Stabilized, Levelled & Initialized Platform version of INS” with its applications. [16]

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Code No: 07A72104 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,December 2011
AVIONICS
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Airborne Doppler Navigation Radar is a Self Substained System. Draw a block diagram to explain FM-CW Radar Altimetev(GPKIS). [16]

2. Discuss the principles of avionic systems/subsystems. [16]

3. Class 'A' bearing accuracy of 1 degree is the requirement as per ICAO specification for Automatic Direction Finder(ADF). Explain in detail how this can be achieved by Aircraft. [16]

4. With the help of a neat diagram explain "4-axis Stable Platform" INS used by aircraft. [16]

5. (a) Give an overview of Satellites Navigation using atleast 3 satellites out of 24 satellites constellation.
   (b) Draw the block diagram of "SAT-NAV" receiver and explain the function to give output of three dimensional position. [8+8]

6. What is an HSI and what are its functions? Draw a typical HSI in operating mode showing the various indications and neatly label it. Explain the operation briefly. [16]

7. What is ARINC and why was it established? Describe the operation of ACARS. [16]

8. (a) Under Normal flight conditions, Balancing of four forces is to be carried out by Auto-pilot for straight and level flight. Draw a schematic and explain
   (b) Explain how practically (Electro-Mechanically) achieved from the cock-pit by pilot this function. [8+8]

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Code No: 07A72104 **R07** **Set No. 3**

IV B.Tech I Semester Examinations,December 2011
AVIONICS
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What does a communication system for an aircraft comprise of? Explain a typical communication system based on VHF radio transmitter receiver. [16]
2. Discuss the typical avionic sub-systems used in civil aircrafts. [16]
3. (a) Listout various types of "Navigational Instrumentation Display" in the Flight Deck.
   (b) Comprehensive airborne Instrument in the Cock-pit is called "Flight Director" system. Explain its details. [8+8]
4. What is 'flight deck'? With the help of block diagrams show the various configurations for grouping flight deck instruments. What are their merits and demerits? [16]
5. Give an overview of American "GPS" Satellite Navigation System for both civil and military users. [16]
6. List various hyperbolic navigation systems. Explain the principle and operation of LORAN-C. [16]
7. Emergency & Diatress situation for any craft and the recovery using the concept of Search & Rescue is vital for the "Safety of the craft". Explain this function both in the air and on the ground with complete details. [16]
8. (a) What is concept of "Hybrid Navigation" for aeronautical applications that works in conjunction with Inertial Navigation System.
   (b) What are 5 basic sub-assemblies of INS? Explain them. [8+8]

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