



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad-500043

AIRCRAFT NAVIGATION SYSTEMS

TUTORIAL QUESTION BANK

Course Title	AIRCRAFT NAVIGATION SYSTEMS				
Course Code	AAE 805				
Programme	B.Tech				
Semester	VII	AE			
Course Type	SKILL				
Regulation	IARE - R16				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	-	-		-	-
Chief Coordinator	Dr. K Maruthupandiyan, Associate Professor, AE				
Course Faculty	Dr. K Maruthupandiyan, Associate Professor, AE				

TUTORIAL QUESTION BANK

S.NO	QUESTIONS
	UNIT-1
	Part-A
1	Define navigation.
2	What is mean by guidance?
3	What is mean by control technology?
4	What are all the modes of navigation?
5	What is the function of positioning sensor?
6	What is the function of Dead-reckoning sensor?
7	What is the function of gyroscope?
8	What is the function of modulator in radio navigation?
9	What is the function of receiver in radio navigation?
10	What are all the subsystems of avionics?
	Part-B
1	Define navigation. Write short notes on navigation system.
2	What are all the different categories of navigation? Brief in detail.
3	What are the trade-off attributes to be considered for choosing navigation system for different aircraft and mission?
4	Explain in detail about several electronic subsystems of avionics.
5	Elaborate in detail about subsystems of military avionics.
6	Draw the block diagram of an aircraft navigation system.
7	Write short notes on accelerometer with a black box diagram.
8	Draw and explain the schematic diagram of two-mode ring laser gyro.
9	Write short notes on function of gyroscopes.
10	Explain the principle of operation of fiber optic gyro with neat sketch.
11	Write short notes on mechanical gyroscope and their types with black-box model sketch.
12	Explain the operation of closed loop fiber optic gyro with neat sketch.
13	Explain in detail about microelectromechanical system (MEMS).
14	Enumerate about working of multi sensor navigation system.
	UNIT-2
	Part-A
1	What are the components of inertial navigation systems?
2	What is the function of accelerometer?
3	What is the function of inertial sensor?
4	What is mean by calibration in INS?
5	What is mean by inertial reference unit?
6	What is the function of inertial measurement unit?
7	What is mean by leveling?
8	What is mean by gyrocompassing?
9	What are all the errors in INS?
10	Define sensor compensation.
	Part-B
1	Write short notes on principles of inertial navigation with neat sketch.
2	Explain in detail about how basic calculation of navigation data is done.
3	Explain about general arrangement of inertial navigation system (INS) components with neat sketch.
4	Draw the block diagram of inertial navigator.
5	Write in detail about strapdown navigator.
6	What are all the advantages and disadvantages of inertial navigator?
7	Explain in detail about three major functions of platform.

8	What are all the typical performance specification for an inertial system
9	Draw the block diagram for mechanization of inertial navigator.
10	What are all the sources of errors in inertial navigation system.
11	Explain in detail about the compensation need for the effect of earths (i) Gravity (ii) rotation (iii) geometry.
12	Write short notes on several emerging trends in inertial navigation system.
13	Draw the block diagram for single axis error model of an inertial navigator.
14	Draw the block diagram for mechanization of a stable baro-inertial altimeter.
15	Explain in detail about different co-ordinate systems for navigation.
UNIT-3	
Part-A	
1	Write different types of radio wave propagation.
2	What is the function of ADF?
3	Define VOR.
4	What are the types of emergency locator transmitter?
5	What is meant by silent zone?
Part-B	
1	Elaborate the general principle of radio navigation system with block diagram.
2	Explain in detail about performance parameter requirements for radio navigation system
3	Explain in detail about radio navigation system types,
4	Explain briefly about automatic direction finder (ADF) and its principle with neat sketch.
5	What are all the operational aspects of automatic direction finder (ADF)?
6	Explain in detail about principle and features of VOR.
7	Write short notes on conventional and doppler VOR.
8	Explain in detail about features of TACAN
9	Explain briefly about instrument landing system and components used in it.
10	Describe the principle of Microwave landing system (MLS)
11	What is the principle behind hyperbolic radio navigation? Explain in detail.
12	Brief about LORAN-C operation and its operational aspects.
13	What are all the advantages and disadvantages of doppler navigation?
14	Explain in detail about different types of emergency locator transmitters.
15	Brief about air traffic control system (ATC) and its transponder modes.

Prepared by:

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