



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

**Instructions for Students / Faculty**

**Mid Term I (Total 60 Marks, 2 HRS. Syllabus from Unit-1)**

- Part A: Total number of questions to be given are six (3 from CO1 and 3 from CO2), each carrying 2 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words for Both Question & Answer**), no objective type or fill in the blanks. Total 12 marks.
- Part B: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student has to answer four (2 from CO1 and 2 from CO2). They are long answer type (**Not More Than 50 Words for Question**), each carrying 4 marks. Total 16 marks.
- Part C: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student has to answer four (2 from CO1 and 2 from CO2). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**)\*, each carrying 8 marks. Total 32 marks.

**Mid Term II (Total 90 Marks, 2.5 HRS., Syllabus from Unit-2)**

- Part A: Total number of questions to be given are ten (5 from CO3 and 5 from CO4), each carrying 3 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words for Both Question & Answer**), no objective type or fill in the blanks. Total 30 marks
- Part B: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer four (2 from CO3 and 2 from CO4). They are long answer type (**Not More Than 50 Words for Question**), each carrying 6 marks. Total 24 marks.
- Part C: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer any four (2 from CO3 and 2 from CO4). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**)\*, each carrying 9 marks. Total 36 marks.

**Mid Term III (Total 90 Marks, 2.5 HRS., Syllabus from Unit-3)**

- Part A: Total number of questions to be given are ten (5 from CO5 and 5 from CO6), each carrying 3 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words for Both Question & Answer**), no objective type or fill in the blanks. Total 30 marks
- Part B: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6). They are long answer type (**Not More Than 50 Words for Question**), each carrying 6 marks. Total 24 marks.
- Part C: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**)\*, each carrying 9 marks. Total 36 marks.

\* **LIST OF ELABORATIVE THEORY QUESTION SUBJECTS:** 3 MH4 - 07 Manufacturing Process, 4 AN4 - 06 Aircraft Materials and Processes (Cr 3), 5 AN4 - 05 Aircraft System (Cr 3), 6 AN4 - 05 Avionics-I (Cr 3), 6 MH4 - 03 Applied Hydraulics & Pneumatics (Cr 3), 6 MH5 - 11 Principles of Management (Cr 3), 6 MH5 - 13 Aircraft Electronics System (Cr 3), 7 AN5 - 12 Maintenance of Airframe and System (Cr 3), 7 AN5 - 13 Helicopter Theory (Cr 3), 7 AG6 - 60.1 Human Engineering and Safety (Cr 3), 7 ST - 01 Avionics II (Special Theory Subject) (Cr 3), 7 MH5 - 11 Design of Mechatronics Systems (Cr 3), 7 MH5 - 12 Robotics and Machine Vision System (Cr 3), 7 MH6 - 13 Medical Electronics (Cr 3), 7 AN6 - 60.1 Aircraft Avionic System (Cr 3), 8 AN5 - 12 Maintenance of Power Plant and System



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**(Cr 3), 8 AN5 - 13 Unmanned Aerial Vehicles & Systems (UAV) (Cr 3), 8 MH5 - 13 Product Development & Launching  
(Cr 3), 8 EC6 - 60.2 Robotics and control (Cr 3)**Instructions For Faculties**

There should be total 6 Course Outcomes (COs) for each subject.

- Mid Term Question Papers are to be submitted as per Course Outcomes (COs) which should be divided equally in Part A, Part B and Part C according to Mid Term Examination and Credit Point.
- In Mid Term-1, the questions are to be given from CO1 and CO2. In Mid Term-2, the questions are to be given from CO3 and CO4. Similarly, in Mid Term-3, the questions are to be given from CO5 and CO6.
- **FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'C' OF QUESTION PAPER**

**INSTRUCTION FOR STUDENTS**

- **STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM,**

**QUESTION PAPER & STUDENTS DETAILS**

Type of Exam	Mid Term 3	Date of Submission	23/07/2021
Name of Faculty	Mr. Sathya Narayanan N	Date Examination	28/07/2021
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 6
Batch	Fifteenth (15)	Subject	6 AN4 - 05 Avionics-I (Cr 3)-

**COURSE OUTCOMES FOR REFERENCE TO FRAME QUESTION PAPERS**

(Faculties are required to mention Course Outcome Number against each part of the question paper)

Course Outcome	5. To make students learn the aircraft VHF, ELT, AIS, CVR, FDR systems its working and construction. 6. To understand about the Navigation Systems and GPS Systems in an aircraft.		
Email I'd	sathyanarayana@soaneemrana.org	Phone No.	978-975-4628
Student Name		Student Reg No.	

**PART A**

All the questions are compulsory to attend.

1. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.

CO 5

Question : 1

State the principle of radio altimeter.



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

32	Radio Altimeter	Avionics Navigation System, Second Edition, Myron Kayton	
<b>Question : 2</b>	List out any six electronic emergency equipment in aircraft system.		
34	Electronic emergency equipment	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 3</b>	Define transponder.		
31	Air traffic control transponder, secondary surveillance radar	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 4</b>	Write a short note on Omega navigation.		
30	VLF/ Hyperbolic navigation	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 5</b>	Enumerate the disadvantages in primary surveillance radar.		
31	Air traffic control transponder, secondary surveillance radar	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			CO 6
<b>Question : 6</b>	Define Coriolis effect.		
35	Coriolis effect	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 7</b>	Explain about Schuler error.		



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

36	Schuler loop	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 8</b>	List out the different sources of error in INS.		
37	Compensation Errors	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 9</b>	Brief about coarse levelling.		
37	Alignment	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 10</b>	Define gimbal lock.		
37	Gimbal lock	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	

**PART B**

**FOR MIDTERM 1 - Part B:** Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).

**FOR MIDTERM 2 - Part B:** Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).

**FOR MIDTERM 3 - Part B:** Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).

**3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.**

CO 5

<b>Question : 1</b>	Explain in detail about Cockpit voice recorder and Distance measuring equipment with relevant diagrams.		
27 and 29	Cockpit voice recorder and DME	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 2</b>	Explain about Weather Radar system in detail with a neat diagram.		



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

32	Weather Radar	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 3</b>	Explain about Emergency locator transmitter with a neat diagram in detail.		
28	Emergency locator transmitter	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			CO 6
<b>Question : 4</b>	Explain about the Integration of GPS and INS utilization of navigation systems in aircraft.		
40	Integration of GPS and INS	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
<b>Question : 5</b>	Explain in detail about the signal structures in GPS and differential GPS(DGPS).		
40	Signal structures and DGPS	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 6</b>	Explain about the different platforms used for INS.		
36	Platform and strap down	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 7 (Old Pattern)</b>			

**PART C**



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

**FOR MIDTERM 1 - Part C:** Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).

**FOR MIDTERM 2 - Part C:** Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).

**FOR MIDTERM 3 - Part C:** Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).

**5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.**

CO 5

**Question : 1** Explain in detail about Air traffic control transponder and secondary surveillance radar with relevant sketches.

31	Air traffic control transponder, secondary surveillance radar	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
----	---	---	--

**Question : 2** Explain in detail about Very High Frequency Omnidirectional Range.

27	VOR	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
----	-----	---	--

**Question : 3** Explain in detail about ARINC communication and Reporting and Cabin Entertainment equipment.

33 and 34	ARINC communication and Reporting, Cabin entertainment equipment	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
-----------	--	---	--

**6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.**

CO 6

**Question : 4** Explain about the basic principles of Accelerometer with a neat diagram and also explain about the position and velocity determination in GPS.

38 and 40	INS components and GPS basic principles	Ian Moir, Allan Seabridge and Malcolm Jukes, 'Civil Avionics Systems', Second Edition, Wiley, 2013.	
-----------	---	---	--

**Question : 5** Explain in detail about the different types of gyroscopes used in INS with neat sketches.



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 132 / SET 1

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

36	INS components	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Question : 6</b>	Explain in detail about the different segments in GPS with a neat diagram.		
38	GPS system description	Myron Kayton and Walter R fried, Avionics Navigation Systems, John Wiley and Sons	
<b>Upload Scanned Document In Case of Numerical or Diagram For Any of The Above Questions. (Mention question number with relevant fig / numerical / equations. Max 150 KB)</b>			
<b>I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.</b>			
<b>Corporate Office: H 974, Palam Extension, Part: 1, Sector: 7, Dwarka, New Delhi</b>			