



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

AERONAUTICAL ENGINEERING

TUTORIAL QUESTION BANK

Course Title	AIR TRANSPORTATION SYSTEMS				
Course Code	AAE526				
Programme	B.Tech				
Semester	VI	AE			
Course Type	Core				
Regulation	IARE - R16				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	-	3	-	-
Chief Coordinator	Mr. P Anudeep, Assistant Professor				
Course Faculty	Mr. P Anudeep, Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students to:	
I	Apply knowledge and skills in the aviation industry and make more effective decisions for organization.
II	Provide insight into current trends and issues in civil aviation, such as aviation safety and security, law and new technology.
III	Understand complexity of air transport operation and to find best solution for the issues.
IV	Understand many transport issues involved in handling passengers, freight of aircraft.

COURSE OUTCOMES (COs):

CO 1	Explain the roles of the International Civil Aviation Organization and the International Air Transport Association in fostering safe and efficient air transport
CO 2	Describes national and international rules and regulations for air transportation
CO 3	Identify organizations controlling the regulatory processes in international aviation
CO 4	Apply basic science principles in estimating stopping and passing sight distance requirements
CO 5	Understand the factors influencing road vehicle performance characteristics and design.

COURSE LEARNING OUTCOMES (CLOs):

AAE526.01	Communicate at technical level with aviation service providers and aerospace professionals and organizations about aircraft and their systems.
AAE526.02	Describe the effects the atmosphere has on aircraft operations and the implications for the air transport industry.
AAE526.03	Analyze the aerodynamic and associated performance characteristics for aircraft and infer the corresponding economic implications.
AAE526.04	Assess the impact of contemporary challenges and practical aspects in air transportation.

AAE526.05	Evaluate pros and cons of emerging technological aspect and responses.
AAE526.06	Develop an applied knowledge to the global aviation industry and key issues.
AAE526.07	Understand international law and policies related to air transportation activities.
AAE526.08	Assess the impact of airline activities and operations on economics and finances.
AAE526.09	Evaluate the various factors influencing aviation industry and effects of these factors on air transportation.
AAE526.10	Developing capability to assess' functions of airports, the basic principles of aviation policy.
AAE526.11	Execution of aviation policies related to airline economics and flight planning.
AAE526.12	Implementing standard procedure for air cargo handling and its management.
AAE526.13	Exposit legal, social, economic, ethical and environment interest while undertaking air transportation system.
AAE526.14	Acquire the competencies to handle airspace, aircrafts and air traffic control system.
AAE526.15	Develop knowledge to coordinate with different organization in the air transportation system.

TUTORIAL QUESTION BANK

UNIT- I				
INTRODUCTION TO AIRCRAFT SYSTEMS				
Part - A (Short Answer Questions)				
S No	QUESTIONS	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes (CLOs)
1	What are the main points about history of aviation evolution in the era of 1960?	Remember	CO 1	AAE526.04
2	Define development and growth in the aircraft transportations?	Understand	CO 1	AAE526.05
3	Define oligopolistic?	Remember	CO 1	AAE526.04
4	Explain about Aerospace industry.	Remember	CO 1	AAE526.02
5	Write about the Air transportation systems.	Remember	CO 1	AAE526.02
6	What do you mean by passenger load factor?	Remember	CO 1	AAE526.04
7	Describe the aviation industry characteristics.	Remember	CO 1	AAE526.04
8	Write about economic impact types in air transportation systems.	Remember	CO 1	AAE526.03
9	What are the characteristics of oligopolistic industries?	Remember	CO 1	AAE526.03
10	What effects got improved in aviation industry after world war- ii?	Remember	CO 1	AAE526.05
Part - B (Long Answer Questions)				
1	Write about the history of evolution in air transportation systems in detail.	Remember	CO 1	AAE526.01
2	What are economic characteristics of airline industries and explain about each characteristic factor in detail.	Remember	CO 1	AAE526.03
3	What is airline passenger load factor? Write about the Significance of airline passenger load factors?	Understand	CO 1	AAE526.05
4	What are the different Factors that affect Commercial Transport Sales? Explain about those factors briefly.	Understand	CO 1	AAE526.04
5	Describe briefly about the structure of Airline Industry between the years 1960-1980.	Remember	CO 1	AAE526.02
6	Explain the development, growth, and challenges in aviation industry?	Remember	CO 1	AAE526.01
7	What are the characteristics of oligopolistic industries? Explain how economic impacts on the airline industry	Remember	CO 1	AAE526.01
8	What do you mean by oligopolistic and Explain how Airlines acts as an oligopolists?	Remember	CO 1	AAE526.03
9	Explain the economic growth in the air transportation between the years 2000-2005.	Understand	CO 1	AAE526.03
10	What are the elements of air transport and describe the future trends in air transport?	Understand	CO 1	AAE526.01
Part - C (Problem Solving and Critical Thinking Questions)				
1	light operates over 1278km with a seating capacity of 250 and the flight is occupied with 217 passengers find RPK and ASK of that flight	Understand	CO 1	AAE526.05
2	Write about the economic characteristics that Impact Personal and Pleasure Travel Patterns	Understand	CO 1	AAE526.05
3	What are the causes and effects of the downsizing in two major segments of the government market? Describe the outlook for the civil aviation market in the early 2000s.	Understand	CO 1	AAE526.05
4	List and briefly describe the major factors affecting commercial transport sales. How does the cyclical nature of civil aviation affect aircraft manufacturing?	Understand	CO 1	AAE526.05
5	Write about Air Commerce Act of 1926? Explain the Significance of economic impact on airline industry?	Understand	CO 1	AAE526.05
6	What is Civil Aeronautics Authority and Explain about the civil aeronautics' act of 1938?	Understand	CO 1	AAE526.05
7	A flight carrying 127 passengers over 977km with a seating capacity of 200.find its RPK and ASK of that flight	Understand	CO 1	AAE526.05
8	What are New-Generation Airliners? Explain about the certificated Air carriers?	Understand	CO 1	AAE526.05
9	What are the economic developments in deregulation and Explain the economic impact of airlines?	Understand	CO 1	AAE526.05
10	A flight carrying 127 passengers over 987km with a seating capacity of 140 and generates 960000 of total passenger revenue. Find the average load factor and yield.	Understand	CO 1	AAE526.05

UNIT-II				
NATURAL ENVIRONMENT, REGULATORY ENVIRONMENT AND OPERATIONAL ENVIRONMENT				
Part – A (Short Answer Questions)				
1	Describe how flora and fauna develop.	Remember	CO 2	AAE526.09
2	What are commercial operations?	Remember	CO 2	AAE526.07
3	What is a demand?	Remember	CO 2	AAE526.07
4	Explain about Traffic forecasters	Remember	CO 2	AAE526.07
5	Expand ICAO and in which year it was started	Remember	CO 2	AAE526.08
6	Elaborate IATA and explain its functions?	Remember	CO 2	AAE526.06
7	What is ICAO and where it is established?	Remember	CO 2	AAE526.09
8	Expand ATUC and what are its functions?	Remember	CO 2	AAE526.05
9	What is VHF and HF explain its difference.	Remember	CO 2	AAE526.09
10	Expand ACARS and what are its applications	Remember	CO 2	AAE526.06
Part - B (Long Answer Questions)				
1	What are tectonic plates and explain the importance of it in airline operations?	Understand	CO 2	AAE526.08
2	Describe briefly about different layers of Earth and describe about each layer in detail.	Understand	CO 2	AAE526.06
3	What is Demand forecasting? With help of a chart explain historical traffic exploration.	Understand	CO 2	AAE526.07
4	Write about international air service agreements and illustrate about five freedoms of the air.	Understand	CO 2	AAE526.09
5	What is deregulation and Describe about its role in International Air Transport Association.	Understand	CO 2	AAE526.09
6	What is very high frequency? Write about the use of press-to-transmit (PTT) buttons.	Understand	CO 2	AAE526.09
7	Explain about the terms Wireless-telegraphy and radio-telephony in detail with help of neat sketches	Understand	CO 2	AAE526.09
8	With help of a neat sketch explain in detail about typical communication systems	Understand	CO 2	AAE526.09
9	What is non-directional beacon and explain its functions in air transportation industry.	Understand	CO 2	AAE526.09
10	What is distance measuring equipment and Explain about the difference between DME and VOR.	Understand	CO 2	AAE526.09
Part - C (Problem Solving and Critical Thinking Questions)				
1	Explain the formation and responsibilities regulatory bodies like ICAO, IATA, DGCA and FAA.	Understand	CO 2	AAE526.09
2	Explain about National authorities of airlines. And explain about its functions and duties	Understand	CO 2	AAE526.09
3	What is Privatization? Write about its advantages and disadvantages.	Understand	CO 2	AAE526.09
4	Explain International Air Transport Association (IATA) is an international industry trade group of airlines write about its functions and regulations	Understand	CO 2	AAE526.09
5	What is ground-proximity warning systems? Write about its role in aircraft systems.	Understand	CO 2	AAE526.09
6	What is flight management systems explain how flight management system works in aircraft?	Understand	CO 2	AAE526.09
7	Explain about ICAO future air navigation systems (FANS) and its advantages and disadvantages when compared to existing systems	Understand	CO 2	AAE526.09
8	Describe about the working of terrain awareness warning system in detail with help of neat diagrams	Understand	CO 2	AAE526.09
9	What is Traffic Collision Avoidance System and explain its major role in civil aviation	Understand	CO 2	AAE526.09
10	Explain the formation and responsibilities regulatory bodies like ICAO, IATA, DGCA and FAA.	Understand	CO 2	AAE526.09
UNIT -III				
AIRCRAFT				
Part - A (Short Answer Questions)				
1	What do you mean by Project cash-flow?	Remember	CO 3	AAE526.12
2	What are indirect operating costs?	Remember	CO 3	AAE526.11
3	What are direct operating costs?	Remember	CO 3	AAE526.12
4	Explain about safety management system?	Remember	CO 3	AAE526.12
5	Define Airworthiness.	Remember	CO 3	AAE526.13

6	What is Cash flow curve and explain it with neat sketch?	Remember	CO 3	AAE526.10
7	What do you mean by ADC	Remember	CO 3	AAE526.12
10	What is CRM and what are its functions?	Remember	CO 3	AAE526.12
11	Write the full form of MTOW	Remember	CO 3	AAE526.13
12	What is Zero range payload	Remember	CO 3	AAE526.10
13	Explain about the about the Distance Measuring Equipment with the help of neat sketch?	Remember	CO 3	AAE526.12
14	Explain about the secondary surveillance radar with the help of neat sketch?	Remember	CO 3	AAE526.13
15	Explain about the NAVIGATION system in aircraft with the help of neat sketch?	Remember	CO 3	AAE526.10
16	What do you mean by the Aircraft Communication Addressing and Reporting System and explain with the help of neat sketch?	Remember	CO 3	AAE526.11
17	What do you mean by the ground-proximity warning systems and explain with the help of neat sketch?	Remember	CO 3	AAE526.11
18	What do you mean by Traffic Collision Avoidance System and explain with the help of neat sketch?	Remember	CO 3	AAE526.10
19	What do you mean by the electronic flight instrumentation systems and explain with the help of neat sketch?	Remember	CO 3	AAE526.12
20	What do you mean by automatic flight control system and explain with the help of neat sketch?	Remember	CO 3	AAE526.13
21	What do you mean by traffic conflict-alerting system and explain with the help of neat sketch?	Remember	CO 3	AAE526.10
22	What do you mean by the Performance management systems and explain with the help of neat sketch?	Remember	CO 3	AAE526.11
Part – B (Long Answer Questions)				
1	Explain Aircraft Communications Addressing and Reporting System (ACARS) is the navigation system used from satellites for navigation explain the process of ACARS in detail with figure.	Understand	CO 3	AAE526.10
2	What is cash flow curve? Explain about cash flow curve in relation to an aircraft.	Understand	CO 3	AAE526.11
3	Explain Distance measuring equipment (DME)process for the aviation system with neat figure and support your answer it's compulsory in the pilot cabin	Understand	CO 3	AAE526.10
4	Discuss about the Compatibility of the operational infrastructure	Understand	CO 3	AAE526.12
5	Explain Traffic collision avoidance system (TCAS) is important in safe journey explain process with figures	Understand	CO 3	AAE526.10
6	Write short notes on: a) Passenger Load factor b) Unique economic characteristics of Air transportation systems.	Understand	CO 3	AAE526.12
7	Explain Instrument landing system (ILS)is for the safety landing system explain the process with neat sketch,	Understand	CO 3	AAE526.12
8	Explain VHF omni- directional radio range (VOR) is the signals explain with diagrams and write applications of any four explain with diagrams and write applications of any four	Understand	CO 3	AAE526.12
9	Explain Navigation has the process of locating points and positions in the earth this is done by satiates explain the process of navigation	Understand	CO 3	AAE526.10
10	Explain the applications of radar in aviation field and write about primary radar process.	Understand	CO 3	AAE526.10
11	Explain about Typical operating cost of airlines. Write in detail about factors affecting typical operating cost of airlines.	Understand	CO 3	AAE526.11
12	What is a flight deck and write in detail about different components in flight deck?	Understand	CO 3	AAE526.11
Part – C (Problem Solving and Critical Thinking)				
1	Explain the different type of the frequencies used in the navigation felid with ranges in hedges.	Understand	CO 3	AAE526.10
2	Explain about different components of aircraft operating costs with the help of a neat flow chart.	Understand	CO 3	AAE526.10
3	Explain the importance of air traffic control. Write about different functions of air traffic control Centre in detail.	Understand	CO 3	AAE526.11
4	Define balancing efficiency and enumerate different issues and explain about them in detail	Understand	CO 3	AAE526.10
5	What do you mean by maximum take-off weight? Explain about its	Understand	CO 3	AAE526.11

	significance in airlines			
6	Write short notes on carbon-fiber reinforced plastic components of aircraft?	Understand	CO 3	AAE526.11
7	Explain how Wake-vortices are generated and write about its relevance in air transportation system.	Understand	CO 3	AAE526.11
8	What is take-off performance? Explain briefly about Take-off performance chart of Boeing 777-200LR	Understand	CO 3	AAE526.10
9	Define Aircraft field length performance and write how dimensions of aircraft effect it.	Understand	CO 3	AAE526.11
10	Explain the significance of Operating speed and altitude in deciding the length of runway	Understand	CO 3	AAE526.11
11	Write about the contribution of recent advancement in technologies to the performance of airliners.	Understand	CO 3	AAE526.12
12	What does an aircraft flight manual consist of? and write about different classifications of aircraft manual.	Understand	CO 3	AAE526.12

UNIT -IV

AIRPORTS AND AIRLINES

Part – A (Short Answer Questions)

1	What do you mean by air fleet utilization?	Remember	CO 4	AAE526.13
2	What do you mean by Indirect operating costs?	Remember	CO 4	AAE526.14
3	What do you mean by direct operating costs?	Remember	CO 4	AAE526.13
4	What do you mean by Computerized reservation systems?	Remember	CO 4	AAE526.13
5	What is the meaning of runway capacity?	Understand	CO 4	AAE526.13
6	Explain about runway characteristics of an airport.	Remember	CO 4	AAE526.14
7	What are runway characteristics?	Understand	CO 4	AAE526.13
8	What do you mean by passenger terminals	Understand	CO 4	AAE526.15
9	What do you mean by monitoring	Understand	CO 4	AAE526.13
10	What do you mean by maneuvering area, airfield lightening	Understand	CO 4	AAE526.13

Part – B (Long Answer Questions)

1	Define the runway length according to the length it has been categorized four types what are they explain in detailed?	Understand	CO 4	AAE526.13
2	What is the importance of the safeguard in the airport explain in detail with figures	Understand	CO 4	AAE526.15
3	Explain Passengers terminals plays an important role in the airport environment write the terminal entrance role in the airport and security process.	Understand	CO 4	AAE526.13
4	Explain computer reservation systems revolutionize the profits out of the industry?	Understand	CO 4	AAE526.15
5	Write in detail about Runway configuration and Explain the purpose of Maneuvering area in airport.	Understand	CO 4	AAE526.14
6	Explain the indirect cost in the aviation budgets for the airline growth and its development	Understand	CO 4	AAE526.13
7	Explain the direct cost in the aviation budgets for the airline growth and its development	Understand	CO 4	AAE526.14
8	Write in detail about apron and explain how it is related to the airports.	Understand	CO 4	AAE526.15
9	What are the different approaches to meet the airport construction successfully by taking issues explain in detail	Understand	CO 4	AAE526.13
10	Explain the ticketing process growth in the last few years with neat figures	Understand	CO 4	AAE526.14

Part – C (Problem Solving and Critical Thinking)

1	Write about different Runway characteristics and explain about each of them in detail	Understand	CO 4	AAE526.15
2	Expand Take Off Distance Available and Take off Run Available and explain its functions	Understand	CO 4	AAE526.15
3	what is accelerate–stop distance available and explain in detail about the role of accelerate–stop distance available in airlines	Understand	CO 4	AAE526.14
4	What do you mean by landing distance available and explain about Runway end safety areas	Understand	CO 4	AAE526.14
5	What do you mean by runway occupancy time? explain how runway capacity is Evaluated.	Understand	CO 4	AAE526.14

6	What is Terminal sizing? Explain about Terminal configurations in detail.	Understand	CO 4	AAE526.13
7	What are Passenger terminals? Explain about different passenger terminals that are found in airports	Understand	CO 4	AAE526.13
8	What do you mean by terminal peak hour passengers Define common-user terminal equipment	Understand	CO 4	AAE526.15
9	What is Obstacle safeguarding in context of airports explain in detail about obstacle limitation surfaces with the help of a neat sketch	Understand	CO 4	AAE526.13
10	What do you mean by Airline fleet planning? Write about different aspects that are to be considered	Understand	CO 4	AAE526.13
UNIT - V				
AIRSPACE				
Part - A (Short Answer Questions)				
1	What do you mean by physical issues	Remember	CO 5	AAE526.16
2	Define the following demand forecast	Remember	CO 5	AAE526.16
3	Define the following FAA, ICAO, DGCA	Remember	CO 5	AAE526.17
4	Write about the functions of FAA.	Remember	CO 5	AAE526.16
5	Write about the functions of DGCA	Remember	CO 5	AAE526.18
6	Write about the functions of ICAO	Remember	CO 5	AAE526.18
7	Write about the functions of IATA	Remember	CO 5	AAE526.18
8	Write about the types of risk assessments	Remember	CO 5	AAE526.16
9	Write about the security regulation types	Remember	CO 5	AAE526.18
10	Write about Reliability of forecasts	Understand	CO 5	AAE526.16
Part - B (Long Answer Questions)				
1	What is airspace sector? Describe the modern data-handling techniques that are used in controlling the air traffic	Understand	CO 5	AAE526.18
2	Explain about the law that states about minimum navigation performance specifications.	Understand	CO 5	AAE526.18
3	Explain the importance of air safety regulations. What is Identification of Friend or Foe?	Understand	CO 5	AAE526.18
4	What is Federal Aviation Administration and discuss the main functions of the Federal Aviation Administration	Understand	CO 5	AAE526.18
5	Explain the International Civil Aviation Organization (ICAO) explain with flow chart?	Understand	CO 5	AAE526.18
6	What are first-generation 'automated' ATC systems. Explain in detail about the working principle of automated atc system	Understand	CO 5	AAE526.17
7	How do you justify Air-navigation service providers as a businesses	Understand	CO 5	AAE526.18
8	Write about the risk assessment in the airport support your answer with its compulsory for every airport.	Understand	CO 5	AAE526.16
9	Write the security regulation types in the airports and aviation field for traveling of passenger in different countries.	Understand	CO 5	AAE526.18
10	What are the functions of ICAO? Write about future air-navigation systems	Understand	CO 5	AAE526.18
Part - C (Problem Solving and Critical Thinking)				
1	What are the different Categories of airspace and illustrate it with help of a neat sketch	Understand	CO 5	AAE526.18
2	Explain the formation and Separation of minima and reduced vertical separation minima	Understand	CO 5	AAE526.18
3	What is standard available route? Explain the significance of standard available route in air transportation systems	Understand	CO 5	AAE526.18
4	What is Capacity, demand and delay derive the relationship between capacity, demand and delay.	Understand	CO 5	AAE526.18
5	Write about a brief chronology of air traffic control system Evolution and explain how it is related with aeronautical fixed telecommunication network	Understand	CO 5	AAE526.18
6	Explain about procedural ATC with radar assistance and draw the schematic diagram of a stage 1 procedural ATC system	Understand	CO 5	AAE526.18
7	Explain in detail about different generations of 'automated' Air Traffic control systems	Understand	CO 5	AAE526.18
8	Write about the current generation radar and computer-based Air Traffic control C systems.	Understand	CO 5	AAE526.18
9	Explain about the International Civil Aviation Organization future air-	Understand	CO 5	AAE526.18

	navigation systems.			
10	Write about distinct sets of approach operating minima and explain how they are defined for aircraft approach operations in low-visibility conditions.	Understand	CO 5	AAE526.18

Prepared by:

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