INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

AERONAUTICAL ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	**INTRODUCTION TO AEROSPACE ENGINEERING**
Course Code	:	**R15-A62113**
Class	:	II B. Tech I Semester
Branch	:	Aeronautical
Year	:	2016 – 2017
Course Coordinator	:	Ms. G.Sravanthi Assistant Professor
Course Faculty	:	Ms. G.Sravanthi Assistant Professor, Mr. R. Suresh kumar Assistant Professor

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S No	QUESTION	Blooms taxonomy level	Course Outcomes
	UNIT – I **HISTORY OF FLIGHT-THE AEROSPACE ENVIRONMENT**		
Part - A (Short Answer Questions)			
1	**Describe** the configurations of the WRIGHT FLYER I developed by the Wright brothers	Understand	1
2	**Discuss** a few personalities and their contributions towards the developments of aircraft	Understand	1
3	**Describe** the configuration of the first successful glider designed by OTTO	Understand	1
4	**Write** a short note on pre WRIGHT era?	Apply	1
5	**Write** the contributions of aircraft evolution towards mankind?	Apply	1
6	**What** are the different types of unconventional designs used in aircrafts?	Understand	1
7	**Differentiate** between Monoplane and Bi-plane?	Knowledge	1
8	**State** the different space agencies which were involved in the evolution of Aircraft industry	knowledge	1
9	**State** the different types of Aerospace industries?	knowledge	1
10	**State** the advantages of monoplane aircraft over biplanes?	knowledge	1
Part - B (Long Answer Questions)			
1	**Explain** in detail the design configurations of the first heavier than air aircraft developed by the Wright brothers?	Analyze	1
	Describe contributions of wright brothers toward the evolution of aeronautical scenario	Understand	1
3	**Describe** the various stages of aircraft evolution	Understand	1

4	**Explain** the greatest success stories in the history of aircraft technology starting from Wright brothers	Knowledge	1
5	**Justify** The year 1930 was considered to be "golden age of aviation".	Understand	1
6	**Explain** why biplanes were replaced by monoplane aircrafts?	Analyze	1
7	**Explain** briefly the impact of space exploration on mankind?	Analyze	1
8	**What** are aerodromes? Describe about the inventor of aerodromes	Analyze	1
9	**What** are Hot air balloons? How they changed the face of the aeronautical history	Analyze	1
10	**Explain** the various functions of various aerospace agencies?	Analyze	1
Part - C (Problem Solving and Critical Thinking Questions)			
1	**Explain** the greatest success stories in the history of aircraft technology	Understand	1
2	**How** can you say that the idea of flying came from viewing the birds?	Analyze	1
3	**Give** a brief out view of the history of aerospace industry	Analyze	1
4	**Explain** all the different space missions and justify your answer with an example	Analyze	1
5	**What** are Hot air balloons? How they changed the face of the aeronautical history	Analyze	1
6	**What** are aerodromes? Describe about the inventor of aerodromes industry..	Understand	1
7	**What** are the effects that the spacecraft may experience in the space? Briefly explain these effects	Understand	1
8	**What** is meant by space mission and space environment?	Understand	1
9	Ornithopters are flying machines. **Justify** your answer	Understand	1
10	**Explain** briefly whether they are successful in their first flights, and also describe the persons who successful in their early attempts of flying	Analyze	1
	UNIT - II **AERODYANMICS AND FLIGHT VEHICLES**		
Part – A (Short Answer Questions)			
1	**Sketch** the various parts of an airplane?	Apply	2
2	**Sketch** different structural members of an aircraft wing?	Apply	2
3	**List** the different components of a retractable under carriage of an aircraft?	knowledge	2
4	**Define** wing loading and aspect ratio?	Understand	2
5	**What** is the primary motive behind using the concept of swept wing of an aircraft?	Understand	2
6	**What** is a canard and state its functions?	Understand	2
7	**Write** the different types of tail configurations that are used in aircraft?	Understand	2
8	**Distinguish** between high wing and low wing configurations?	Understand	2
9	**What** do you understand by the term "Blended body design"?	Knowledge	2
10	**What** is the role of a STOL aircraft?	Knowledge	2
Part - B (Long Answer Questions)			
1	**Explain** in detailed classification of air vehicles?	Understand	2
2	**What** are the structural members of an aircraft wing and give their functions	Understand	2
3	**What** are High lift devices? Describe a typical leading edge high lift device control system	Understand	2
4	**List** the basic assumptions made in deriving the equations of motion for an aircraft	Understand	2
5	**Explain** briefly the conventional and unconventional methods of tail unit arrangement	Knowledge	2
6	**What** are the different types of aircraft?	Knowledge	2
7	**Explain** the different types of aircraft construction with neat sketches	Knowledge	2
8	**Explain** the fixed axis system of the aircraft	Knowledge	2
9	**What** is meant by High-lift device? Explain the different high lift devices.	Understand	2
10	**What** are the different control surfaces that can be incorporated on the aircraft?	Understand	2
Part – C (Problem Solving and Critical Thinking)			
1	**Write** a note on engineering models for aerodynamic forces on a wing systems	Understand	2
	Distinguish between rocket engines and jet engines	Apply	2
2	**Write** the different types of forces and moments in aircraft systems and their applications	Understand	2
3	**Sketch** and explain the types of launch vehicles and missiles	Understand	2
4	**Sketch** the anatomy of the airplane and its configuration .	Knowledge	2

5	**List out** the various types of moments on the vehicle.	Apply	2
6	**Sketch** and explain lift generating conditions	Apply	2
7	**Write a** note on center of pressure aerodynamic of wings	Understand	2
8	**Narrate** different concepts used in propeller and the jet engine	Understand	2
9	**Derive** any one of the governing equations	Understand	2
	UNIT-III **FLIGHT VEHICLE PRERFORMANCE AND STABILITY**		
Part - A (Short Answer Questions)			
1	**Explain** performance parameters of flight vehicle	Understand	3
2	**Explain** Performance in steady flight vehicle	Understand	3
3	**Write** a note on CRUISE	Evaluate	3
4	**Write** about accelerated flight symmetric maneuvers	Evaluate	3
5	**Write** a note on CLIMB	Evaluate	3
6	**Write** about turns, side slips, take-off and landing	Evaluate	3
7	**Write** a note on RANGE	Evaluate	3
8	**Distinguish** between static and dynamic stability	Apply	3
9	**Write** a note on ENDURANCE	Understand	3
10	**Explain** longitudinal and lateral stability conditions	Understand	3
Part – B (Long Answer Questions)			
1	**Define** stability of aircraft	Understand	3
2	**What** is meant by stalling? Explain briefly	Remember	3
3	**Differentiate** static stability and directional stability with neat sketches	Remember	3
4	**Explain** the following with neat sketches a) Lateral motion b) Longitudinal motion c) Directional motion	Understand	3
5	**Write** a note on cruise ,climb, range and endurance	Evaluate	3
6	**Explain** the concept of accelerated flight symmetric manoeuvres	Evaluate	3
7	**Write** a short note on turns, side slips ,take off and landing	Apply	3
8	**Define** flight vehicle stability conditions	Apply	3
9	**Distinguish** between longitudinal and lateral stability	Apply	3
10	**Write** handling qualities of the airplanes	Apply	3
Part – C (Problem Solving and Critical Thinking)			
1	**Justify** how an performance in steady flight conditions	Understand	3
2	**Narrate** the importance of performance parameters	Create	3
3	**Justify** how working concepts of	Understand	3
4	**Justify** how working concepts of	Evaluate	3
5	**Write** notes on flight vehicle , static and dynamic stability	Understand	3
6	**List** different types of stability conditions of flight performance	Understand	3
7	**Explain** what is a handling qualities of the airplanes with neat diagram	Understand	3
8	**Explain** the maneuvers used in flight vehicle performance	Understand	3
9	**Explain** the working principles of sideslips ,takeoff and landing conditions	Create	3
10	**List** out various types performance and stability conditions. Discuss its working principle briefly	Evaluate	3
	UNIT-IV **SATELLLITE SYSTEMS ENGINEERING-HUMAN SPACE EXPLORATION**		
Part – A (Short Answer Questions)			
1	**What** are the types of space missions	Knowledge	4
2	**Write** about operational satellite system	Understand	4
3	**Write** a note on satellite bus subsystems	Apply	4
4	**State** satellite structures for engineering	Analyze	4
5	**What** are the materials used in satellite system	Knowledge	4
6	**State** communication and telemetry engineering	Understand	4
7	**Define** thermal control .	Understand	4
8	**What** are different types of space missions	Understand	4
9	**What** are different types of mission objectives involved in satellite system	Understand	4

	engineering		
10	**Write** historical back ground of human space exploration	Knowledge	4
Part – B (Long Answer Questions)			
1	**What** is an operational satellite system .	Apply	5
2	**Explain** elements of satellite system .	Knowledge	5
3	**Explain** mechanisms and materials used in satellite systems	Knowledge	5
4	**Explain** how power systems and satellite bus subsystems are used	Understand	5
5	**What** is the need for control of thermal in satellite system	Create	5
6	**Discuss** human space exploration	Knowledge	5
7	**Write** historical background of space exploration .	Apply	5
8	**Write** about the Soviet and US missions with neat sketches	Apply	5
9	**Distinguish** between national and international space missions configuration	Create	5
10	**Describe** the flight safety and life support in space sketches.	Create	5
Part – C (Problem Solving and Critical Thinking)			
1	**write** applications of communications and telemetry conditions	Understand	5
2	**Write** short notes on **a)** Operational satellite system **b)** Elements of satellite **c)** C)satellite bus system	Understand	5
3	**What** is a Attitude determination and control	Apply	5
4	Justify the need for propulsion and station keeping	Apply	5
5	**Discuss** the different space missions and mission objectives	Understand	5
6	**Explain** the Mercury, Gemini, Apollo (manned flight to the moon)	Apply	5
7	**Explain** the Skylab, Apollo-Soyuz, Space Shuttle	Create	5
8	**Compare** the US and Russian designs with neat sketches	Evaluate	5
9	**Differentiate** missile and space technology	Evaluate	5
10	**Explain** the Indian effort in aviation, missile and space technology	Understand	5
UNIT-V INTRODUCTION TO ENGINEERING DESIGN, AIR TRANSPORTATION			
Part - A (Short Answer Questions)			
1	**Write** about flight safety and security conditions in the field of aviation	Evaluate	6
2	**What** is design and Write the classification of design	Remember	6
3	**What** are the objectives of air transportation systems	Remember	6
4	**Explain** the design process ,design thinking ,design drawing	Remember	6
5	**How** design is used for mission performance and safety requirements	Remember	6
6	**Write** a short note on concurrent engineering	Understand	6
7	**What** is computer aided engineering	Remember	6
8	**Write** a note on principle constituents of ATS	Remember	6
9	**Write** a short note on organizational role in ATS	Understand	6
10	**How** national and international regulations are issued to aircrafts	Remember	6
Part - B (Long Answer Questions)			
1	**Explain** design as a critical component of engineering education	Understand	7
2	**Explain** the Sequence of Design as a skill	Understand	7
3	**Describe** a process of design thinking and design drawing ?	Apply	7
4	**Explain** the concept of concurrent engineering	Remember	7
5	**Identify** the importance of civil and military objectives	Remember	7
6	**Explain** the concept of regulations used in flight	Create	7
7	**Justify** How India is advanced in the field of aerospace engineering	Remember	7
8	**Illustrate** the different levels of flight safety and security	Understand	7
9	**How** can you say India is a super nation in space technology	Understand	7
10	**Discuss** how organization role involved in ATS	Understand	7
Part – C (Problem Solving and Critical Thinking)			
1	**Evaluate** the Design as a critical component of engineering education	Evaluate	7
2	**Justify** Design as a skill with an example	Evaluate	7
3	**Write** the importance of design process, design thinking and design drawing and Write its advantages	Evaluate	7
4	**Explain** Design for mission, performance and safety requirements	Evaluate	7

5	**Explain** Concurrent engineering and Computer aided engineering	Evaluate	7
6	**Explain** the Civil, Military objectives and principle constituents	Evaluate	7
7	**Explain** the Regulation for both National and International flights	understand	7
8	**Describe** a Flight safety and security condition with a example	understand	7
9	**Write** Note on Indian effort in aviation	understand	7
10	**Describe** missile and space technology adopted with respect to aerospace	understand	7

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