



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

AERONAUTICAL ENGINEERING

ASSIGNMENT QUESTIONS

Course Name	:	AEROSPACEPROPULSION II
Course Code	:	A62114
Class	:	III B. Tech II Semester
Branch	:	Aeronautical Engineering
Year	:	2017 – 20178
Course Coordinator	:	C.Satya Sandeep , Assistant Professor
Course Faculty	:	Dr.Muruthu Pandiyan, Professor, C.Satya Sandeep, 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 Outcome
ASSIGNMENT-I UNIT-I			
1	Write a short note on incremental flight velocity, budget for climb out and acceleration	Understand	1,2
2	What is the difference between the propulsion of low speed aircraft by propellers and that of high speed aircraft and missiles by jet propulsion engines?	Remember	1,2
3	Describe the main advantage in using ramjet? What is the major limitation of the ramjet? Also briefly discuss the limitations on the lowest and the highest flight Mach numbers in a subsonic combustion ramjet.	Understand	1,2
4	List out the sources of energy in hypersonic environmental applications and detail each one of them.	Understand	1,2
5	What are the various types of mission profiles of a space craft?	Remember	1,2
UNIT-II			
1	What are the values of the velocity and altitude losses due to gravity? Ignore drag and assume vertical trajectory	Understand	3,4
2	Explain the construction and operation of a ramjet engine and derive an expression for the ideal efficiency	Remember	3,4
3	With a neat sketches the principle of operation of ram jet engine	Understand	3,4
4	Explain what are the reasons and specifications of spill over drag, plume drag. Discuss any possible ways to reduce them.	Understand	3,4

S. No	Question	Blooms Taxonomy Level	Course Outcome
5	Sketch and explain the working of the air turbo-rocket (ATR). Write down its applications and advantages.	Remember	3,4
UNIT-III			
1	Derive a mathematic expression for the combustion efficiency. List out the significance of the same.	Remember	5,6
2	Write a short note on <ul style="list-style-type: none"> • Effect of atmosphere • Engine parameters • Propellants used in chemical rockets. 	Understand	5,6
3	Differentiate between equilibrium energy balance and mass balance. Write a short note on their importance.	Understand	5,6
ASSIGNMENT – II UNIT-III			
4	Write short note on <ul style="list-style-type: none"> (i) Gas pressure feed system (ii) Turbo pump feed system 	Remember	5,6
5	What are the common problems associated with liquid propellants and what are the desired properties of liquid propellants.	Understand	5,6
UNIT-IV			
1	What are the limitations of an electrical rockets propulsion system? What are the various types of electrical propulsion system? Explain one system with a neat sketch.	Understand	7
2	Write a short note on <ul style="list-style-type: none"> a. ignition surface recession rate b. gas generation rate c. effect of propellant temperature 	Remember	7
3	Explain about the following: <ul style="list-style-type: none"> a. Charge design b. thrust profile c. burning stability d. erosive burning 	Understand	7,8
4	Discuss about oxidizers and fuels of liquid propellant rocks. Also state what is monopropellant and bipropellant?	Remember	8
5	Explain different types of combustion instabilities and the corrective measure to minimise the effect.	Remember	8
UNIT-V			
1	Differentiate between magneto plasma dynamic (MPD), pulsed plasma (PPT) with neat sketches.	Understand	9,10
2	Explain Hall Effect. List of the practical application of hall effect in electric propulsion.	Remember	9,10
3	Describe the working principle of ionic thruster with neat sketch explaining each part and its functions.	Understand	9,10
4	List out the specifications of some of the real time space vehicles which use electric propulsion.	Understand	9,10
5	Explain the functions of, <ul style="list-style-type: none"> a) Fuel cells b) Solar cell arrays c) Solar generators d) Nuclear power generators 	Remember	9,10