

**R09**

Code No: 56072

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech III Year II Semester Examinations, April - 2018**

**AEROSPACE PROPULSION-II**

**(Aeronautical Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions  
All questions carry equal marks**

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- 1.a) What are the various factors to be considered in improving the thrust and power of high speed propulsion systems?
- b) How the specific thrust, specific impulse and propulsive efficiency can be found for hypersonic space vehicles? [7+8]
- 2.a) What are the various problems to be encountered in supersonic combustion of turbojet engines?
- b) What are the various losses take place during the flow of gases through nozzle of hypersonic vehicles and explain about viscous losses and plume losses? [7+8]
- 3.a) Develop the equations for jet velocity and rocket velocity for chemical rocket engines.
- b) Describe the thermo-chemical analysis of combustion taking place in chemical rocket engines and explain about the droplets present in the gases. [7+8]
- 4.a) How the shape, size, materials of combustion chamber effect the design and performance of chamber of liquid propellant rocket engine?
- b) Describe with a block diagram the propellant feed system and method of ignition occurred in liquid propellant engines. [7+8]
- 5.a) What are the various methods used to enhance the burning rate and explain its effect on the propulsive power and efficiency?
- b) What are the advantages and limitations of hybrid propellant rocket motors over solid propellant rockets? [7+8]
- 6.a) Differentiate between electrical propulsion system with chemical rocket propulsion, mentioning the principle of working advantages and limitations.
- b) Explain with a schematic diagram, the construction and working of electro-static thrusters. [7+8]
- 7.a) What is nuclear thermal rocket and explain its working?
- b) What are the methods to be adopted to cool the combustion chamber of nuclear rocket engine and mention the fluids used? [7+8]
- 8.a) What are the various advantages took place in the aerospace propulsion systems to?
- b) Explain the construction and working of electric micro thrusters used for propulsion. [7+8]

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