

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018 – 19 Examination

Semester: 6**Subject Code: 03101353****Subject Name: Propulsion-II****Date: 04/05/2019****Time: 10:30am To 01:00pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. Brayton cycle is used for _____ only where both the compression and expansion processes take place in rotating machinery.
2. Thermal efficiency of Brayton cycle is _____.
3. The first component the air encounters is the _____ and the second component is the compressor.
4. The maximum temperature is limited to _____ by the materials from which the turbine blades and nozzles are made.
 (a) 850 to 1700degree (b) 700 to 1800 degree (c) 700 to 1650 degree (d) 750 to 1850 degree
5. Only _____ of total air is used for combustion and remaining is used for cooling.
 (a) 10% (b) 15% (c) 25% (d) 30%
6. Main components of Ramjet engines are _____
 (a) Inlet (b) Combustion chamber (c) Nozzle (d) All of above
7. Performance of an inlet depends on the _____ on both internal and external surfaces.
8. Afterburner method is located between _____ and nozzle.
 (a) diffuser (b) combustor (c) turbine (d) inlet
9. Combustion efficiency generally is in the order of _____ at sea level.
 (a) 99-100% (b) 98-99% (c) 97-98% (d) 96-97%
10. A nozzle operates according to the _____ effect to bring the exhaust gases to ambient pressure.
11. Define Internal Compression Subsonic Intakes.
12. Enlist the factors affecting the thrust of gas turbine engine.
13. In combustion chamber, define Fuel Injector.
14. What is the Ramjet engine?
15. What is efficiency of nozzle?

Q.2 Answer the following questions. (Attempt any three) (15)

- A) Explain Injection of Refrigerant: (Water + Alcohol)thrust augmentation method with diagram.
- B) What are the differences between Ramjet and Turbojet?
- C) Explain the five main Requirements of Combustion Chamber during designing.
- D) Explain Oblique - Shock diffusers.

- Q.3 A) A Brayton cycle operates with a regenerator of 75% effectiveness. The air at the inlet to the compressor is at 0.1 MPa and 30 degree, the pressure ratio is 6.0 and the maximum cycle temperature is 900 degree. If the compressor and the turbine have efficiencies of 80% each, find the percentage increase in the cycle efficiency due to regeneration. (07)**

- B) Explain about the stability limit of gas turbine combustion chamber with neat diagram. (08)**

OR

- B) What is Flame Stabilization? And explain how we achieve flame stabilization in gas turbine combustion chamber? (08)**

- Q.4 A) Explain about the working principle of Ramjet engine with neat diagram. (07)**

OR

- A) Explain and derive the thrust equation of Ramjet engine with T-S diagram. (07)**

- B) Explain about the pressure distribution in the C-D nozzle with neat diagram. (08)**