

**B.Tech. AEROSPACE ENGINEERING
(BTAE)**

Term-End Examination

June, 2018

00153

BASE-002 : ROCKET PROPULSION

Time : 3 hours

Maximum Marks : 70

Note :

- (i) *Attempt any **seven** questions.*
 - (ii) *All questions carry equal marks.*
 - (iii) *Use of scientific calculator is permitted.*
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- 1. State the fundamental differences between jet propulsion and rocket propulsion. How are rockets classified ? 10
- 2. What is the role of a nozzle in rocket propulsion ? Discuss its characteristics in brief. 10
- 3. What are basic inputs for design of a solid propellant rocket ? How do they influence the design ? 10

4. What is the meaning of cross-sectional loading ?
Find it for 250 mm outer diameter multi-perforated propellant grain with 10 holes of 20 mm diameter each. 10
5. Explain in brief the features of a liquid propellant rocket propulsion. 10
6. Discuss in brief, internal ballistic parameters, thrust co-efficient and specific impulse. 10
7. Derive an expression for exit plane velocity for the flow through a rocket nozzle. Also explain why the role of gamma (γ) is not observed on exit plane velocity. 10
8. Write short notes on any **two** of the following : $2 \times 5 = 10$
- (a) Aero-thermo Chemistry
 - (b) Hybrid Propellant Rocket
 - (c) Staging in Rockets
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