

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

Term-End Examination

00058

June, 2016

BASE-002 : ROCKET PROPULSION

Time : 3 hours

Maximum Marks : 70

Note :

- (i) *Attempt any five questions.*
- (ii) *Each question carries equal marks.*
- (iii) *Use of scientific calculator is permitted.*

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1. (a) Describe the concept of nozzleless propulsion with its merits and demerits.
 - (b) What are the important factors that influence the burning rate of a solid propellant? 7+7=14
 2. (a) Describe the salient features of a chemical rocket. Obtain an expression for its heat of reaction.
 - (b) Define combustion efficiency. How can it be increased? 7+7=14

3. Describe three important applications of rocket propulsion in brief. 14
4. Explain the following terms used in solid propellant rocket : $4 \times 3 \frac{1}{2} = 14$
- (a) Linear burning rate
 - (b) Combustion rate
 - (c) Propulsion area ratio
 - (d) Equilibrium combustion pressure
5. (a) Explain physical or chemical reasons for maximum value of specific impulse at a particular mixture ratio of oxidizer to fuel.
- (b) Derive an expression for ideal velocity of a rocket. 7+7=14
6. What are the important factors to be considered for the designing of a solid propellant rocket ? 14
7. Write short notes on any *two* of the following : 7+7=14
- (a) Aero-thermo Chemistry
 - (b) Hybrid Propellant Rocket
 - (c) Propellants
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