CBCS SCHEME

USN | | | | | | | | | | |

15AE564

Fifth Semester B.E. Degree Examination, June/July 2018
Basics of Rockets and Missiles

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Write a note on some famous space launch vehicles and strategic missiles. **(08 Marks)**

b. Explain the functions and types of space launch vehicle and military missiles. **(08 Marks)**

OR

2 a. Explain the mission profile of space launch vehicles, with a neat diagram. **(08 Marks)**

b. Draw a thrust profile of a typical solid propellant motor and explain all the terms involved. **(08 Marks)**

Module-2

3 a. List the solid propellant characteristics. **(06 Marks)**

b. Explain the grain configuration for solid propellants. **(10 Marks)**

OR

4 a. Define , explain and compare the mono propellant and bi propellant and cold gas propellant of liquid propellant. **(06 Marks)**

b. Explain the liquid propellant rocket engine with a gas pressure feed system. **(10 Marks)**

Module-3

5 a. Explain with a neat sketch, the airframe components of rockets and missiles. **(08 Marks)**

b. Explain the classification of missiles. **(08 Marks)**

OR

6 a. Derive the expression for forces acting on a missile while passing through atmosphere. **(08 Marks)**

b. Explain the drag estimation due to different missile drag components. **(08 Marks)**

Module-4

7 a. Derive the equation motion in one dimension and from there drive and explain Tsiolskovsky's Ideal rocket equation. **(08 Marks)**

b. Explain the different actual launch trajectories. **(08 Marks)**

OR

8 a. Explain the thrust magnitude control, with neat diagram. **(08 Marks)**

b. Explain the four categories of thrust vector control (TVC) mechanisms and its types. **(08 Marks)**

Module-5

9 a. Explain with neat sketch, a typical static test stand for large liquid propellants. **(06 Marks)**

b. Write short notes on : i) Flight testing ii) Post Accident procedures. **(06 Marks)**

c. List the physical quantities to be measured in rocket testing. **(04 Marks)**

OR

10 a. Explain the criteria for selection of materials for rockets and missiles. **(08 Marks)**

b. Explain the requirements of materials for thermal protection and pressure vessel. **(08 Marks)**

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