

B.E., DEGREE EXAMINATIONS MAY/JUNE 2013

Seventh Semester

AERONAUTICAL ENGINEERING

AER120: Space Mechanics And Missile Technology

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10x1=10 Marks)

1. Solar time is
 - A. Earth passing time
 - B. Sun facing time
 - C. Sun position
 - D. All the above
2. Argument of periapsis defines the _____ in the orbital plane
 - A. orientation of the major axis
 - B. orientation of the minor axis
 - C. orientation of the inclination
 - D. orientation of the ellipse
3. _____ is the use of propulsion systems to change the orbit of a spacecraft
 - A. orbital maneuver
 - B. Hermann Oberth
 - C. Transfer orbit
 - D. specific impulse
4. Injection errors are maximum in
 - A. Orbit
 - B. Inclination
 - C. nodal separation
 - D. None of the above
5. Ecliptic means
 - A. Planet Locator
 - B. Star moving path
 - C. Passes through 12 zodiac constellations
 - D. None of the above
6. Time of flight measured by
 - A. Mass spectrometry
 - B. infrared spectroscopy
 - C. ultrasonic flow meter
 - D. All the above
7. Intermediate-range ballistic missile range is
 - A. Below 300km
 - B. 300km to 1000km
 - C. 1000km to 3500km
 - D. 3500km to 5500km
8. Effects on space craft depends on
 - A. solar-terrestrial system
 - B. geomagnetic field
 - C. Van Allen radiation belts
 - D. space weather
9. One of the following is conventional guided missiles
 - A. Theatre ballistic missile
 - B. Intercontinental ballistic missile
 - C. Anti-submarine missile
 - D. None of the above
10. Space rendezvous is an orbital maneuver between
 - A. Many space craft
 - B. Two space craft
 - C. Docking on stations
 - D. Space stations

PART B (10 x 2 = 20 Marks)

11. Define solar time.
12. List out the layers of earth atmosphere.
13. What are the aspects of Space vehicle trajectories?
14. What is meant by Injection Error?
15. Differentiate between arrival and departure trajectories.
16. Define time of flight.
17. What is meant by ballistic?
18. What are the peculiarities in space?
19. List out the missile classification.
20. Define burnout velocity.

PART C (5 x 14 = 70 Marks)

21. a) Briefly explain about Reference Frames and Coordinate Systems
(OR)
b) Short notes on orbital elements.
22. a) Explain about the different types of orbits and it's significant.
(OR)
b) Discuss about General Aspects of satellite Injections
23. a) Briefly explain about Gravity-Assist maneuver
(OR)
b) Discuss about Sphere of Influence.
24. a) Briefly explain about ballistic trajectory.
(OR)
b) Discuss the effect of Space Environment on the Selection of Materials.
25. a) Explain about the Airframe Components of Missiles.
(OR)
b) Discuss about the Separation Dynamics and Techniques
