B.E.(Aeronautical Engineering) Semester Seventh (C.B.S.)
Space Flight Mechanics

P. Pages : 2

Time : Three Hours

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0895

Max. Marks : 80

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Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data wherever necessary.
10. Diagrams and chemical equations should be given wherever necessary.
11. Illustrate your answers wherever necessary with the help of neat sketches.
12. Use of non programmable calculator is permitted.

1. a) Explain about the solar system in detail ? **7**

b) How will you define the following : **6**
  i) Earth's Atmosphere
  ii) Sidereal Time
  iii) Solar Time

OR

2. Define the following in term of space mechanics : **13**
  i) Reference frame   ii) Coordinates system
  iii) Vernal Equinox   iv) Celestial sphere
  v) Asteroid   vi) Comets
  vii) Meteoroid

3. a) Explain the N-Body problem with the help of suitable diagram and expression ? **7**

b) What is satellite orbits relation between position and time, explain ? **6**

OR

4. a) Define Lagrange points in terms of Three-Body problem ? **7**

b) Explain and describe the two-body problem ? **6**

5. a) What do you mean by orbit deviations due to injection errors ? **6**

b) Derive Cowell's Method for perturbed satellite orbit ? **7**

OR

6. a) Derive a suitable derivation on Encke's method for perturbed satellite orbit ? **6**

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	b)	Derive transfer and inverse transfer matrix in term of Euler's Angles ?	**7**
7.	a)	Explain in detail about Two-Dimensional interplanetary trajectories ?	**7**
	b)	What are the basic concept of interplanetary trajectories ?	**6**

OR

8.	a)	Explain in detail about fast interplanetary trajectories ?	**6**
	b)	What are the parameters to launch a satellite from earth to orbit, explain in detail ?	**7**
9.	a)	Write a short note on Trajectory Geometry ?	**6**
	b)	Explain Boost phase in terms of Ballistic Missile Trajectories.	**8**

OR

10.	a)	What are the influence coefficients in trajectory geometry ?	**8**
	b)	What do you mean by the position of impact point, explain it ?	**6**
11.		What are criteria for selecting a material for spacecrafts ?	**14**

OR

12.		Write a short notes on :	**14**

    i)   Polymer - matrix composite.

    ii)   Carbon - Carbon composite material.

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