EOTS PROBLEM STATEMENTS

1. International Space Station is an artificial satellite of the Earth where people can stay for short periods of time. Give a step by step procedure and explain the feasibility of establishment of a space city in orbit around the Earth.

2. The Drake equation gives the probability of communicating with a civilization. It states that:

$$N = R^* \cdot f_p \cdot n_e \cdot f_\ell \cdot f_i \cdot f_c \cdot L$$

where:

N = the number of civilizations in our galaxy with which communication might be possible;

and

R^* = the average rate of star formation per year in our galaxy
f_p = the fraction of those stars that have planets
n_e = the average number of planets that can potentially support life per star that has planets
f_ℓ = the fraction of the above that actually go on to develop life at some point
f_i = the fraction of the above that actually go on to develop intelligent life
f_c = the fraction of civilizations that develop a technology that releases detectable signs of their existence into space
L = the length of time for which such civilizations release detectable signals into space.

Castor is a multiple star system consisting of 2 star systems revolving around each other and a third star system revolving about these two. Each of these star systems themsevles consists of two stars revolving about their common centre of mass.
Construct an equation similar to the Drake equation giving explicit parameters to calculate the probablility of finding such a star system within a distance of 10 light years from the sun.

P.S. Best answer will be choosen on the basis of assumptions and the justifications provided in their support.

Mail the solutions latest by 12p.m. On Sunday, 10/4/2001 to gshubham@iitk.ac.in