4 i) coordinates of the three satellites are $(0,0)$, $(9,15)$ and $(21,0)$ respectively. The corresponding distances are ∞ 13,5 and 20 units respectively. The If the coordinates of the ship are (x,y) then we can write the distance equations as —

$$(x-0)^2 + (y-0)^2 = 13^2 \qquad \cdots (1)$$
$$(x-9)^2 + (y-15)^2 = 5^2 \qquad \cdots (11)$$
$$(x-21)^2 + (y-0)^2 = 20^2 \qquad \cdots (111)$$

& Solving for the equations one we get-
$$x = 5, \quad y = 12$$

So the coordinates of the ship is $(5,12)$

ii) In case of DGPS a specif there is a fixed location whose coordinates are known. It calculates its position using trilateration and obtains the errors which is passed on to the device. The device can now calculate its location based accurately by taking into consideration this error.

5 i)a) This figure plots the cumulative distribution function of CFs similarity value in presence of human at different distances and in absence of human.

	1 feet	1 mtr	2 mtr	3 mtr	4 mtr
20th	0.72	0.91	0.91	0.87	0.87
40th	0.75	0.93	0.92	0.89	0.89
60th	0.9	0.95	0.94	0.91	0.91

ii) a) The first figure plots the cumulative distribution function of accuracy per spot for Pinloc and Horus-like.

The second figure plots the cumulative distribution function of false positive per spot for Pinloc and Horus like.

  b) 90th percentile
     0.25 (0.3, 0.05)

6) Probability that user requests a page within 2, 3 and 5 pages are 0.75, 0.83 and 0.9 respectively.

Tail energy = 300 units

Energy required to fetch 2, 3 and 5 pages are 20, 30 and 50 units respectively

Total energy required to receive a document = 400 units.

Expected Energy savings if 2 pages are prefetched $= \dfrac{(0.75 \times 300) - 20}{400}$

$= 0.512$

" " " 3 " " " $= \dfrac{(0.83 \times 300) - 30}{400}$

$= 0.572 \; 0.547$

" " " 5 " " " $= \dfrac{(0.9 \times 300) - 50}{400}$

$= 0.55$