KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF ELECTRICAL ENGINEERING

EE 672	Satellite Communications	QUIZ # 1
Semester (072)	Section (01)	22 March, 2008

NAME :		
I.D. # :		Score : / 10

1) A satellite is rotating around the earth in a circular equatorial orbit. It appears above a particular earth station every 5 hours. Calculate the angular velocity of the satellite, the orbital period, and the orbital height. ($\mu = 3.9861352 \times 10^5\ km^3/s^2$, earth radius = 6370 *km*) (Hint: *Kepler's third law*, $a^3 = \frac{\mu}{\omega^2}$)

2) Answer the following questions. (a question may have more than one answer)

i. Some advantages of using satellites in low earth orbit are:

a. Use of hand held receivers b. No frequency shift due to Doppler effects
c. Coverage of large area on the earth d. Reduction of transmission delay
e. Provide communications 24 hours a day

ii. An earth station is located in Dhahran (Saudi Arabia) at longitude -50.08° and latitude +26.18°. In which part of the sky would you locate a satellite with a sub-satellite point longitude of +7°?

a. North b. North- East c. East d. South- East
e. South f. South- West g. West h. North- West

iii. The angle between the orbital plane and the equatorial plane is:

a. The eccentric anomaly b. The true anomaly
c. The inclination d. The right ascension of ascending node

iv. The line joining the centre of the earth and the direction of perigee defines the x-axis in the following coordinate system:

a. Geocentric Equatorial b. Heliocentric ecliptic
c. Right ascention-declination d. Perifocal
e. Celestial horizon