KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF ELECTRICAL ENGINEERING

EE 672	Satellite Communications	QUIZ # 4
Semester (062)	Section (01)	14 May, 2007

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

Design a transmitting earth station to provide a clear air C/N of 30 dB in a Ku-band transponder at a frequency of 14.15 GHz. The gain of the satellite Ku-band receiving antenna is 31 dB. Use an up-link antenna with a diameter of 5 m and an aperture efficiency of 68%, and find the up-link transmitted power required to achieve the required C/N. The up-link earth station is located on the 2 dB contour of the satellite footprint. Allow 1.0 dB on the uplink for miscellaneous and clear air losses. Use the path length to the satellite of 38500 km. The noise bandwidth is 27 MHz (corresponding to 27 Msps QPSK). And the receiver system noise temperature is 500 K.

(Boltzman's constant = -228.6 dBW/K/Hz)