## KING FAHD UNIVERSITY OF PETROLEUM & MINERALS DEPARTMENT OF ELECTRICAL ENGINEERING

EE 418	Introduction to Satellite Communications	QUIZ # 3
Semester (051)	Section (01)	26 November, 2005
NAME :		
I.D. # :		Score : / 10

- a. Calculate the exact maximum directivity of an antenna with radiation intensity given by:  $U = U_m \cos^2 \theta$  for  $0 \le \theta \le \frac{\pi}{2}$  and  $0 \le \phi \le 2\pi$ .
- b. Calculate the half-power beam-widths  $(\theta_{HP1} and \theta_{HP2})$  in two perpendicular planes containing the direction of maximum radiation.
- c. If the approximate directivity is obtained from:  $D_o = 4\pi/(\theta_{HP1}.\theta_{HP2})$ , where  $\theta_{HP1}$  and  $\theta_{HP2}$  are expressed in radians; calculate the percentage error in obtaining the approximate directivity.

Do not write below this