QUIZ 2

1. N (obj) = 1000 photons/sec/cm**2 /A * 10**(−0.4*mag) * tel area * atm.transmission * total reflectivity * tel.efficiency * bandwidth * q.eff * exp.time

N (sky) = 1000 photons/sec/cm**2 /A * 10**(−0.4*mag/sq.arcsec) * aperture area * tel area (sq.arcsec)* total reflectivity * tel.efficiency * bandwidth * q.eff * exp.time

Tel Ap. dia.	D=	30	cm	Tel. ap area	706.85843	cm**2
Atm. Transn	T=	0.8				
Star mag.	V=	16	mag	Flux factor	3.9810717e−07	
Skr br.	V/sq.arcsec	18	mag/sqarcsec	Sky flux factor	6.3095734e−08	
Reflectivity	R=	0.9				
N(refl)		2				
Bandwidth	W=	1000	Angstroms			
Tel. efficienc	T(tel)=	0.7				
Exp. time	t	120	sec			
Q. Eff.	q	0.8				
Sky ap. radi	r(ap)	2.5	arcsec	Sky ap.area	19.634956	sq.arcsec
Readout noi	n	15	electrons	Arcsec/pixel	1.1	
				M (pixels)	16.227237	
N(obj)	12253.967					
N(sky)	47666.874					
Noise (obj+s	252.13482					
Noise(obj+s	sqrt(N(obj)+N(sky)+ M*n**2)					
S/N	48.600852					

2.	D=	200	cm
	d=	10	cm
	f(coll)=	180	cm
	f(cam)=	50	cm
	w=	0.03	cm
	dlam/dx=	40	A/mm
	w'=	0.0083333333	cm w * (fcam/fcoll)
	delta(lam)=	3.3333333	A w' * (dlam/dx)
	R=	1500	at 5000A

3. Dark current is probably more important in spectroscopic applications because in that case the signal levels are generally much lower or the exposure times are much longer, since the light of a star is spread over many pixels. The ratio of signal to dark current is therefore higher in spectroscopic applications.