ASSIGNMENT 12: Solutions

Q1. (d), to place feed at convenient place

Q2. (b), α should be decreased.

Q3. (a), higher beamwidth

Q4. (b), lower beamwidth

Q5. (d), first increases and then decrease

Q6. (a), $2d^2/\lambda$.

Q7. (b), circular polarisation will ensure at least half of tx. power.

Q8. (c), no. of images, $\frac{360^\circ}{\alpha} - 1 = 7$.

Q9. given $G = 40\,dB = 10^4$, $f = 4\,GHz \Rightarrow \lambda = 7.5\,mm$

$$\therefore G = \frac{4\pi}{\lambda^2} \cdot A \cdot \eta \Rightarrow 10^4 = \frac{4\pi}{(7.5)^2} \cdot \pi\left(\frac{D}{2}\right)^2 \cdot 0.7$$

$$\Rightarrow D = 285\,cm \quad (d)$$

Q10 given $\frac{f}{d} = 0.45$.

$$\therefore \theta_0 = \tan^{-1}\left|\frac{\frac{1}{2}\left(\frac{f}{d}\right)}{\left(\frac{f}{d}\right)^2 - \frac{1}{16}}\right| = \tan^{-1}\left|\frac{\frac{1}{2} \times 0.45}{(0.45)^2 - \frac{1}{16}}\right|$$

$$= 58.1^\circ \quad (b).$$