

⑦ A Voltage  $V$  is a function of time,  $t$ , and is given by  $V(t) = X \cos \omega t + Y \sin \omega t$

where  $\omega$  is a constant angular frequency, and  $X$  and  $Y$  are independent gaussian variables each with zero mean and variance  $\sigma^2$ . If  $V(t)$  can be written as

$$V(t) = R \cos(\omega t + \theta)$$

then

- $R$  is a random variable with a Rayleigh probability density and  $\theta$  is a random variable with uniform density.
- $R$  is a random variable with a gaussian probability density and  $\theta$  is a random variable with uniform density.
- $R$  is a random variable with a Rayleigh probability density and  $\theta$  is a random variable with exponential density.
- $R$  is a random variable with a gaussian probability density and  $\theta$  is a random variable with exponential density.