

UNIT-4

	QUESTIONS (SHORT)	CO	Cognitive Level
1	State the cross power density spectrum.	C205.4	Remember
2	Prove that Imaginary part of $S_{xy}(\omega)$ and Imaginary part of $S_{yx}(\omega)$ are odd functions of ω .	C205.4	Understand
3	Show that $S_{xy}(\omega) = S_{yx}(-\omega) = S_{yx}(\omega)^*$	C205.4	Remember
4	If $X(t)$ and $Y(t)$ are Uncorrelated and have constant mean values \bar{X} and \bar{Y} then show that $S_{xy}(\omega) = 2\pi \bar{X} \bar{Y} \delta(\omega)$.	C205.4	Understand
5	If $X(t)$ and $Y(t)$ are orthogonal then prove that $S_{xy}(\omega) = S_{yx}(\omega) = 0$.	C205.4	Understand
6	Show that the power spectrum density at zero frequency is equal to the area under the curve of the autocorrelation $R_{xx}(\tau)$.	C205.4	Understand
7	State power density spectrum.	C205.4	Remember
8	What is the bandwidth of the power density spectrum?	C205.4	Remember

	QUESTIONS (ESSAY)	CO	Cognitive Level
1	Discuss about cross power spectrum density and its properties with proofs?	C205.4	Remember
2	A random process has autocorrelation function $R_{XX}(\tau) = 1 - \tau $ for $ \tau \leq 1$; 0 for otherwise. Find the PSD.	C205.4	Apply
3	Consider a random process $X(t) = A \cos(\omega_0 t + \theta)$ where A and ω_0 are constants and θ is a uniformly distributed random variable over the interval $(0, \pi/2)$. find the average power of the random process $X(t)$.	C205.4	Apply
4	Discuss the relationship between power spectrum density and auto correlation function.	C205.4	Remember
5	Describe about power spectrum density and its properties.	C205.4	Remember
6	If the auto correlation of a WSS Random Process is $R_{xx}(\tau) = K.e^{-K \tau }$, show that its power spectrum density is $S_{xx}(\omega) = \frac{2}{1 + (\omega / K)^2}$	C205.4	Apply
7	Explain the relationship between cross power spectrum density and cross correlation function.	C205.4	Remember
8	Find the auto correlation function for $S_{xx}(\omega) = \frac{157 + 12\omega^2}{(16 + \omega^2)(9 + \omega^2)}$	C205.4	Apply