

UNIT-V

Noise sources and Information theory

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	What is thermal noise how is it quantified?	Remember	CO5	PO1,PO2,PO3,PO4
2	Write short notes on different types of noises	Understand	CO5	PO1,PO2,PO3,PO4
3	Explain the concept of effective input noise temperature.	Remember	CO5	PO1,PO2,PO3,PO4
4	Define information ?Explain about information rate?	Remember	CO5	PO1,PO2,PO3,PO4
5	What is entropy?	Understand	CO5	PO1,PO2,PO3,PO4
6	Write the expression for code efficiency in terms of entropy	Understand	CO5	PO1,PO2,PO3,PO4
7	What is the power spectrum of white noise	Remember	CO5	PO1,PO2,PO3,PO4
8	Explain about channel Capacity Theorem,	Remember	CO5	PO1,PO2,PO3,PO4
9	Explain about noise figure?	Understand	CO5	PO1,PO2,PO3,PO4
10	Explain Shannon-Fano coding.	Remember	CO5	PO1,PO2,PO3,PO4
Part – B (Long Answer Questions)				
11	a) Describe the mathematical description of noise figure	Remember	CO5	PO1,PO2,PO3,PO4
	b) Write expression for Narrow band noise and give diagrams how to extract in phase components and quadrature components from narrow band noise	Remember	CO5	PO1,PO2,PO3,PO4
12	a) Five source messages are probable to appear as $m_1=0.4, m_2=0.15, m_3=0.15, m_4=0.15, m_5=0.15$ find coding efficiency for a)Shanon coding b) huff mam coding	Understand	CO5	PO1,PO2,PO3,PO4
	b) Explain the concept of entropy and its properties	Remember	CO5	PO1,PO2,PO3,PO4
13	a) From Shannon hartley law find the maximum value of the channel capacity if band width is provided as ∞ .		CO5	PO1,PO2,PO3,PO4
	b) Define Mutual information and Entropy of two variables $H(x:y)$? State all properties of mutual information?	Remember	CO5	PO1,PO2,PO3,PO4
14	a) Derive the Expression for effective input noise temperature of a cascaded system in terms of its individual input noise temperature	Remember	CO5	PO1,PO2,PO3,PO4
	b) The a noise figure of a system is 0.3db and the power gain is 10^8 . Find the output noise power at room temperture. Bandwidth is 10MHZ	Understand	CO5	PO1,PO2,PO3,PO4
15	a) Derive the Expression for equivalent noise bandwidth of a system	Understand	CO5	PO1,PO2,PO3,PO4
	b) What is a binary symmetric channel? Write down its transition matrix in terms of p, the transition probability	Understand	CO5	PO1,PO2,PO3,PO4
16	a) A message source generates one of four messages randomly every microsecond. The probabilities of these messages are 0.4, 0.3, 0.2, and 0.1. Each emitted message is independent of the other messages in the sequence. Find the rate of information generated by this source (in bits per second).	Understand	CO5	PO1,PO2,PO3,PO4
	b) An analog signal band limited to 10kHz is quantized in 8 levels of a PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Calculate the entropy and the rate of information.	Understand	CO5	PO1,PO2,PO3,PO4

* **Blooms Taxonomy Level (BT)** (L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analyzing; L5 – Evaluating; L6 – Creating)

Course Outcomes (CO)

Program Outcomes (PO)

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