		0												
	HAL O		Reg. No.											
· · · · · ·		Question Paper Co	de 1	1647										
	B.E./B.T	ech DEGREE EX	AMINATI	ONS,	NO	V/]	DE		202	22				
		Fourth	Semester											
	E	lectronics and Com	nunication	Engi	inee	rin	g							
	20	ECPC401 - COMM	UNICATIO	ON T	HE	OR	Y							
		(Regulat	tions 2020)											
Duration: 3 H	lours							M	lax	. N	/lai	ks:	100)
		PART - A (10	$\times 2 = 20 \text{ M}$	arks))									
		Answer Al	LL Question	IS									Man	ha
	1. (200 3).											K-	Leve	ks, 1,CC
I. What ar	e the nee	ds for modulation?										2,	K1,C	201
2. State the	princip.	le of heterodyning.										2,	K1,C	CO1
3. States C	arson's 1	ule.										2,	KI, C	202
4. Compar	e Narrov	vband & Wideband Fl	M.									2,	K2,C	202
5. State ce	ntral limi	it theorem.										2,	K1,C	:03
												2,	K2,C	203
6. Differer	tiate bet	ween random process	and random	n varia	able									
 Differen Define 	tiate bet thermal	ween random process noise. Give the expr	and randon ession for t	n variation the th	able Ierm	al :	noi	ise	vo	lta	ge	2,	K1,C	CO4
 Differen Define across a 	tiate bet thermal resistor.	ween random process noise. Give the expr	and randon ession for t	n varia the th	able	al :	noi	ise	vo	olta	ge	2,	K1,C	CO4
 Different Define across a What is 	tiate bet thermal resistor. White N	ween random process noise. Give the expr oise?	and randon ession for t	n varia	able	al :	noi	ise	vo	lta	ge	2, 2,	К1,С К1,С	CO4
 Differen Define across a What is What is 	tiate bet thermal resistor. White N meant by	ween random process noise. Give the expr oise? y companding?	and random ession for	n varia	able	al :	noi	ise	vo	lta	ge	2, 2, 2, 2,	К1,С К1,С К1,С	204 204 205

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	(i) Derive the expression for AM power distribution.	5,K2,CO1
		(ii) Explain the working principle of Super heterodyne receiver	8,K2,CO1
		OR	
	b)	Explain in detail about VSB modulation and demodulation. Also give	13,K2,CO1
		applications of VSB.	
12.	a)	Explain the principle of indirect method of generating a wideband FM	13,K2,CO2
		signal.	
		OR	
	b)	With the phasor representations explain the working of Foster Seeley	13,K2,CO2
		discriminator.	

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create 11647 1

3. a)	Show that the random process $x(t) = A \cos(\omega t + \Phi)$ is wide sense	13,K3,CO3
	stationary if A and w are constant and Φ is uniformly distributed	
	random variable over the interval $[0, 2\pi]$.	
	OP	

OR

- b) Let $X(t) = A \cos(\omega t + \Phi)$ and $Y(t) = A \sin(\omega t + \Phi)$, where A and ω are ^{13,K3,CO3} constants and Φ is a uniform random variables $[0, 2\pi]$. Solve the cross correlation of x(t) and y(t).
- 14. a) (i) Explain the operation of pre emphasis & de emphasis in FM in ^{7,K2,CO4} communication system?
 - (ii) Write in detail about FM threshold effect. 6,K2,CO4

OR

- b) (i) Explain about Thermal noise with Power spectral density.
 - (ii) Discuss in detail about the narrowband noise and analyze the ^{6,K2,CO4} properties of in-phase and quadrature components of narrow band noise.
- 15. a) Explain the concept of low pass sampling, Aliasing & signal ^{13,K2,CO6} reconstruction.

OR

b) Explain in detail about(i) FDM(ii) TDM.

1

PART - C $(1 \times 15 = 15 \text{ Marks})$

16. a) Obtain the expression for figure of merit of DSB-SC receiver using 15,K2,CO4 coherent detection.

OR

b) Derive the Power Spectral Density of in-phase and quadrature phase 15,K2,CO4 noise of narrow band noise. Find the PDF of sine wave pulse noise.

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

2

11647

7,K2,CO4

7,K2,CO6

6,K2,CO6