

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2009 ANALOG COMMUNICATION SEMESTER - 4

Time: 3 Hours]		\$	[Full Marks : 70
******* , O ***OG**)	· ·	· ·	

GROUP - A (Multiple Choice Type Questions)

Cho	ose th	ne correct alternatives	for any ten of th	ne following:	$10 \times 1 = 10$
i)	In T	V broadcast, sound is	s modulated in		
	a)	VSB	b)	FM	
	c)	SSB	d)	DSBSC.	
ii)	A b	alance modulator circ	uit is used to rej	ect	
	a)	carrier	b)	LSB	
	c)	USB	d)	LSB and USB.	
iii)	The PCM signal can be generated by amplitude modulating				
	a)	PAM	b)	PPM	
	c)	PWM	d)	PDM.	
iv)	A st	tation is tuned to frequ	uency of 1600 k	Hz, the image frequen	cy is
	a)	1600 kHz	b)	1145 kHz	
	c)	2055 kHz	d)	2510 kHz.	
v)	The standared IF value for AM receivers is				
	a)	455 kHz	b)	455 MHz	
	c)	108 MHz	d)	10.7 MHz.	

4523 (10/06)

CS.	/B.TECH	(ECE-N)/SEM-	4/EC-403/09

_	2009	
Г	THE PERSON NAMED IN	
l	1 40 11	
ı	10000	Ė
ı	Otecn	K
ı		P
ı	. 🛰	
Ľ	ALC: UNKNOWN	1

VI	A pn	ase modulated wave has		
	a)	no sideband	b)	infinite no of sideband
, ·	c)	two sideband	d)	six sideband.
vii)	NBF	M is		
	a)	inferior to AM	b)	superior to AM
	c)	same as AM	d)	superior to WBFM.
viii)	Сар	ture effect is active in		
	a)	AM	b)	PAM
	c)	PCM	d)	FM.
ix)	Mod	lern FM demodulators uses		
	a)	only quadrature detector	b)	only PLL
	c)	both (a) and (b)	d)	diode detector.
x)	The	no. of sidebands is WBFM is		
	a)	1	b)	more than 1
.54	c)	infinity	d)	none of these.
xd)	A se	ource X which produces five	symbols	with probabilities $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ and
•	$\frac{1}{16}$. The source entropy is		
	a)	1.875 b/symbols	b)	2.875 b/symbols
	c)	3 b/symbols	d)	5.5 b/symbols.

CS/	в.тесн	(ECE-N)/SEM-4	/EC-403/09	5		Ulech
	xii)	De-emphasi	s in FM system ir	volves		
		a) compr	ession of modulat	ing signal		
,		b) expans	sion of the modula	ating signal		
٠		c) amplif	lcation of lower fro	equency sign	al of modulating signal	
		d) amplif	ication of higher f	requency sign	nal of modulating signal.	
	xiii)	QAM modul	ator needs a phas	e shifter of p	hase shift	
		a) $\frac{\pi}{6}$		b)	$\frac{\pi}{4}$	
		c) $\frac{\pi}{3}$		d)	$rac{\pi}{2}$.	
	xiv)		cy deviation pro-		VHF carrier by a signal	of 100 Hz is
		a) 100		b)	250	
	• • •	c) 500		d)	750.	
	xv)	PAM signal o	can be demodulate	ed by using		. .
	•	a) a low-p	oass filter	b)	a high-pass filter	
		c) a band	-pass filter	d)	none of these.	
			G	ROUP - B		
			(Short Ans	wer Type Qu	estions)	
			Answer any three	of the follow	ring questions.	$3\times 5=15$
2.	Expl	ain Ring Modu	ılator for AM gene	ration in a d	ouble balanced modulator	r.
3.	a)	Define FM si	gnal in time doma	un.		
	b)	How can FM	be generated us	ing phase m	odulator circuit ? Explai	n using block
		diagram.				2 + 3
4.	a)	What do you	mean by TDM?	Where is thi	s concept used?	
	b)	Draw the PC	M system block d	iagram		3+2

4523 (10/06)



5. What is a slope detector? What are the problems of slope detectors and how is it overcome using a balanced slope detector?

2 + 3

6

6. What are PWM and PPM? Compare the performance of this two signals.

2 + 3

GROUP - C

(Long Answer Type Questions)

Answer any three of the following questions.

 $3\times15=45$

- . a) What is pilot carrier in AM transmission?
 - b) What is modulation index of an AM signal?
 - c) Find out the maximum limit of transmission efficiency of an AM signal for a single tone message.
 - d) Draw the schematic diagram of VSB modulator and explain.

2 + 2 + 5 + 6

- 8. a) Draw the block diagram of a superheterodyne receiver and explain its working principle.
 - b) What is image frequency related to it?
 - c) Explain the 'Selectivity' parameter related to it.

10 + 2 + 3

- 9. a) Draw the schematic diagram of NBFM generation and explain.
 - b) Explain the principle of FM wave generation using direct method. State the demerits of this method.
 - c) Consider an angle modulated signal:

$$y(t) = [10 \cos [\omega_c t + 3 \sin (\omega_m t)].$$

Assume Phase Modulation and $f_m = 1$ kHz.

Calculate.

- i) frequency modulation index.
- ii) bandwidth when f_m is doubled.

5 + 5 + 5

4523 (10/06)



- 10. a) State Channel capacity theorem.
 - b) What is meant by entropy of a source?
 - c) What is source coding? Why is it done?
 - d) A source is generating 8 symbols with probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05 and 0.05. Calculate the entropy and rate of information.

$$3 + 3 + (2 + 2) + 5$$

1. Write short notes on any three of the following:

 3×5

- a) Foster Seeley Detector
- b) VSB modulation
- c) Super heterodyne receiver
- d) Stereophonic FM transmitter and receiver
- e) Direct method of FM generation.

END