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# GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester – Regular) Examinations, June – 2021

## BPCEC 4020 - Analog Communications (E.C.E)

Time: 2 hrs

Maximum: 50 Marks

### Answer ALL Questions

The figures in the right hand margin indicate marks.

#### PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

#### Q.1. Answer ALL questions

[CO#] [PO#]

- |  |                               |   |
|--|-------------------------------|---|
| a. The base band signal is preserved in the envelope of AM signal only if modulation index is less than ____                                 | 1                             | 1 |
| (i) 0  | (ii) 1                        |   |
| (iii) 5  | (iv) 100                      |   |
| b. The spectrum of the sampled signal may be obtained without overlapping only if ____.  | 1                             | 1 |
| (i) $f_s \geq 2f_m$  | (ii) $f_s < 2f_m$             |   |
| (iii) $f_s > f_m$  | (iv) $f_s < f_m$              |   |
| c. In an AM system, if total power is 500W and carrier power is 300 W then the modulation index is ____.                                     | 1                             | 2 |
| (i) 2.08   | (ii) 1.66                     |   |
| (iii) 1.09   | (iv) 0.6                      |   |
| d. The AM-SC signal exhibits _____ at zero crossings   | 2                             | 2 |
| (i) maximum amplitude  | (ii) minimum amplitude        |   |
| (iii) quadrature null effect   | (iv) Phase reversal           | 2 |
| e. Which of the following analog modulation scheme requires minimum transmitted power and minimum channel bandwidth?                         | 2                             |   |
| (i) VSB  | (ii) SSB-SC                   |   |
| (iii) DSB-SC   | (iv) AM                       |   |
| f. VSB is used in television for transmission of   | 3                             | 1 |
| (i) audio signals  | (ii) carrier signals          |   |
| (iii) video signals  | (iv) noise signals            |   |
| g. FM signal can be generated using phase modulator by _____ the modulating signal   | 3                             | 1 |
| (i) Differentiating  | (ii) integrating              |   |
| (iii) summing  | (iv) amplifying               |   |
| h. 100MHz carrier is frequency modulated by 10 KHz wave. For a frequency deviation of 500 KHz, The modulation index of the FM signal is ____ | 3                             | 3 |
| (i) 100  | (ii) 50                       |   |
| (iii) 70   | (iv) 90                       |   |
| i. The purpose of Pre-emphasis circuit is to improve the SNR of ..... of message signal  | 4                             | 2 |
| (i) all the frequency components   | (ii) low frequency components |   |
| (iii) high frequency components  | (iv) zero frequency component |   |
| j. The type of noise created in active devices due to random emission of charge carriers:  | 4                             | 1 |
| (i) erratic noise  | (ii) thermal noise            |   |
| (iii) flicker noise  | (iv) shot noise               |   |

**PART – B: (Short Answer Questions)****(2 x 5 = 10 Marks)**Q.2. Answer **ALL** questions

	[CO#]	[PO#]
a. What is modulation? What is the need of it in communication systems?	1	1
b. Draw the frequency spectrum and phase representation of SSB-SC signal.	2	2
c. Compare NBFM and WBFM.	3	1
d. Define noise and give its classification.	4	1
e. What is noise quieting effect in FM?	4	1

**PART – C: (Long Answer Questions)****(6 x 5 = 30 Marks)**Answer **ANY FIVE** questions

	Marks	[CO#]	[PO#]
3. Derive the total power radiated by Amplitude Modulated Full carrier signal.	(6)	1	1
4. Explain how amplitude modulation performed in switching modulator.	(6)	1	1
5. Explain the generation and synchronous detection of SSB signal.	(6)	2	2
6. Narrate the procedure to obtain DSB SC signal using Ring modulator.	(6)	2	2
7. List the difference between FM and PM. Also write the expression for bandwidth of FM with example.	(6)	3	1
8. Elucidate the function of building blocks of super heterodyne receiver.	(6)	3	1
9. Derive the expression for figure of merit of AM receiver using envelope detection.	(6)	4	2
10. Explain in detail about various sources of noise.	(6)	4	1

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