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**Question Paper Code : 86575**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth Semester

Electrical and Electronics Engineering

EC 1308 A—PRINCIPLES OF COMMUNICATION ENGINEERING

(Common to Electronics and Instrumentation Engineering)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by modulation index in AM?
2. Calculate the BW of FM signal whose frequency deviation is 75 KHZ and signal frequency is 2.5 KHZ.
3. State Carson's Rule.
4. State the difference between Frequency Modulation and Phase Modulation.
5. Define BPSK.
6. What are the advantages of digital modulation?
7. "PAM system is an example of time division multiplex system" – Justify.
8. Define Quantization error.
9. Define processing gain related to spread spectrum communication.
10. State the advantages of CDMA over TDMA.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the waveform AM signal for over modulation, under modulation and 100% modulation, assuming sinusoidal modulating signal of 1 KHz, carries of 1 MHz. (8)
- (ii) Explain the detection of AM signals using envelope detector. (8)

Or

- (b) (i) Derive the relation between carrier power and total transmitter power of AM signal. (8)
- (ii) Discuss, the draw backs of a TRF Receiver. (8)

12. (a) (i) Derive an expression for the Narrowband FM. (8)  
(ii) Write a note on the average Power of FM wave. (8)

Or

- (b) (i) Explain the operation of a Armstrong FM transmitter. (8)  
(ii) How the PLL is used as a FM demodulator? Explain. (8)
13. (a) With a phasor diagram and a block diagram, explain the operation of QPSk transmitter. (16)

Or

- (b) Write broadly on Duo Binary encoding system with truth table for signalling and spectrum of encoded signal. (16)
14. (a) Explain the generation of PAM signal with neat diagram. (16)

Or

- (b) Write notes on :
- (i) Eye pattern (8)  
(ii) Adaptive equalisation for data transmission. (8)
15. (a) (i) What is PN sequence? Explain with relevant diagram, the PN sequence generation. (10)  
(ii) State and explain the properties of PN sequence. (6)

Or

- (b) (i) Describe the DS spread PSK transmitter and receiver with necessary diagrams. (10)  
(ii) Derive the expression for probability of error of this system. (6)
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