

Total No. of Questions – [3]

Total No. of Printed Pages: 2

P.R. No.	
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PAPER CODE	U222-244 (ESE)
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**May 2022 (ENDSEM) EXAM**  
**S.Y. E & TC (SEMESTER - II)**  
**COURSE NAME: Analog and Digital Communication**  
**COURSE CODE: ETUA22204**  
**(PATTERN 2020)**

[Max. Marks: 30]

Time: [1Hr]

**(\*) Instructions to candidates:**

- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed
- 3) Use suitable data where ever required

Q.1

a) What is the importance to study the characteristics of line codes? interpret the importance of transmitted power, bandwidth and error probability with reference to the properties of line codes.

[4]

b) We know that data transmitted (baseband signal) in digital communication is not a deterministic signal. Bandwidth and transmitted power are key parameters to look at. So we required to find the power spectral density (PSD) of baseband signal. Illustrate the generalize method how we can estimate the PSD of any line code?

[6]

**OR**

b) As the timing extraction and zero PSD at zero frequency. Which line codes provides at least one parameter. Justify your answer with time domain and/or frequency domain interpretation.

[6]

Q2

a) The main role of baseband receiver is to enhance signal to noise ratio. For a baseband receiver interpret and illustrate how it is achieved.

[4]

b) With the help of signal space representation of QPSK signal, correlate distance between the symbols and probability of error. Also justify how the bandwidth requirement reduces to half.

[6]

**OR**

b) For same number of symbols (16) in PSK and QAM the distance between the symbols in QAM is more than PSK for same amount of power transmitted. Justify with signal space representation. [6]

Q.3

a) Summarize the properties of PN sequence. [4]

b) What is the importance of PN sequence in spread spectrum modulation? How it is used in DS-SS? Explain in brief with time and frequency domain representation only. [6]

**OR**

b) Illustrate with block diagram and spectrum representation, generation of FH-SS technique. [6]