BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCES

DEPARTMENT OF MATHEMATICS AND PHYSICS

COMMUNICATION SYSTEMS

EEE 3105

Examination Paper

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: Calculator

INSTRUCTIONS

1. **Answer any FOUR questions only.**
2. **Each question carries 25 marks.**
3. **Show your steps clearly in any calculation.**
4. **Start the answers for each question on a fresh page.**

MARK ALLOCATION

QUESTION	MARKS
1.	**25**
2.	**25**
3.	**25**
4.	**25**
5.	**25**
6.	**25**
TOTAL	**100**

Question 1

a) Differentiate between an AM signal and a narrowband FM signal? [3 Marks]
b) Write short notes on FM stereo multiplexing. [10 Marks]
c) Describe the areas of applications of AM citing its merits and demerits [12 Marks]

Question 2

a) Expound on why digital communication is popular enumerating its advantages and disadvantages. [15 Marks]
b) Briefly explain the term angle modulation highlighting the relationship between phase and frequency modulation. [10 Marks]

Question 3

a) Explain in detail on how AM signals are demodulated. [20 Marks]
b) Define the term 'modulation index' for AM citing the degrees of modulation [5 Marks]

Question 4

a) Describe PCM concept [5 Marks]
b) Write short notes on Intersymbol Interference, ISI [20 Marks]

Question 5

a) Describe Channel capacity with necessary equations. [10 Marks]
b) Discuss on the need for error control codes. [6 Marks]
c) Justify the need for adaptive equalization in a switched telephone network. [4 Marks]
d) Define error probability. [5 Marks]

Question 6

a) Describe the purpose of using an eye pattern. [6 Marks]
b) Differentiate between systematic and non-systematic codes. [4 Marks]
c) Debrief on any three means of electronic transmission of signals for communications. [3 Marks]
d) Narrate on how an engineer can measure the **"goodness"** of a communication [12 Marks]

End of Paper