



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

THIRD YEAR SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (.....)

SPH 330: DIGITAL SYSTEMS AND INTERFACING

DATE:

TIME:

INSTRUCTIONS:

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 3 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) State four advantages and disadvantages of digital transmission. (4 marks)
- b) Enumerates various kind that happen at baseband of digital communications (4 marks)
- c) Explain the concept of aliasing and anti-aliasing effect in digital communication systems. (8 marks)
- d) Enumerate the importance's of using digital loop carrier in subscriber line. (4 marks)
- e) Compare DSO and conventional oscilloscope hence enlist four applications (6 marks)
- f) What Is Troubleshooting a Network? Why Troubleshooting Skills Are Essential for Network Management. (4 marks)
- g) Discuss briefly four kinds of troubleshooting Physical Connectivity Issues that comes under this category. (4 marks)

QUESTION TWO (20 MARKS)

- a) Explain the following terms: (8 marks)
- i. Sampling
 - ii. Sampled value
 - iii. Sampled interval
 - iv. Sampling rate
 - v. Sampling theorem
- b) Explain the two methods of sampling. (12 marks)

QUESTION THREE (20 MARKS)

- a) Explain the concept of quantization and its impact on communication systems in minimizing error over the channel. (6 marks)
- b) Demonstrate the evolution of digital Telephony and show how it changed the communication sector. (8 marks)
- c) Using illustration, explain the functional block of digital oscilloscope (6 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the two-term in details synchronous communication and asynchronous communication for serial device interface hence enlist their characteristics. (12 marks)
- b) Explain the principle of spectrum analyzer and enlist its applications (8 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss various basic Network troubleshooting steps (8 marks)
- b) Explain the available tools that are used in treating network issue during network troubleshooting and diagnosing (12 marks)