



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (TELECOMMUNICATION AND INFORMATION TECHNOLOGY)

SPH 435 MICROPROCESSORS APPLICATIONS II

DATE: 8/12/2021

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

Answer Question One and Any Other Two Questions

Question one (compulsory) (30 marks)

- a) Why is memory needed in a microprocessor-based system? (3 marks)
- b) Define the following terms. (8 marks)
 - i) memory map
 - ii) software
 - iii) compiler
 - iv) Debugging
- c) Differentiate RAM and ROM (3 marks)
- d) If the word length of an EPROM was expanded using two 16K X 8 EPROM chips, what would be the resulting byte capacity, organization and storage density? (6 marks)
- e) What is the starting address of a 2 K-bytes memory whose ending address 37FF_H? (4 marks)
- f) Give 6 types of microprocessor instruction types and give an example in each. (6 marks)

QUESTION TWO (20 MARKS)

- a) Design a memory circuit to interface a 4K-byte RAM to an 8085 microprocessor with starting address 7000H. (12 marks)
- b) What are the two problems related to timing that are likely to arise in a memory interface design? (4 marks)
- c) What are the functions of input/output ports? (4 marks)

QUESTION THREE (20 MARKS)

- a) Compare input and output ports in terms of design and device select pulse generation (5 marks)
- b) Design a 16 X 16 memory using four 8K X 8 SRAM memory chips. (15 marks)

QUESTION FOUR (20 MARKS)

Describe the steps involved in software development.

QUESTION FIVE (30 MARKS)

- a) Compare high level programming languages to low level languages. (8 marks)
- b) Discuss the steps involved in the compilation process. (12 marks)