Riara University

UNIVERSITY EXAMINATIONS

EXAMINATION FOR JANUARY/APRIL 2015/2016 FOR BACHELOR OF SCIENCE COMPUTER SCIENCE

RCCS 210   EMBEDDED SYSTEMS

DATE 8TH APRIL 2016   TIME: 11-1 P.M.

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during reading time.

This is a closed book examination. Text book/Reference books/notes are not permitted.

SPECIAL INSTRUCTIONS:

This examination paper consists Questions in Section A followed by section B.

Answer **Question 1 and any Other Two** questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **Keep ALL bags and caps at the front of the examination room and DO NOT refer to ANY unauthorized material before or during the course of the examination.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. ( ) will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

SECTION A (COMPULSORY)

QUESTION ONE [30 MARKS]

a. Define an embedded system?   **[3 marks]**

b. Briefly discuss five characteristics of embedded systems?   **[5 marks]**

c. Discuss types of embedded systems.   **[8 marks]**

d. The process of converting the source code representation of your embedded software into an executable binary image involves three distinct steps. Discuss the steps. **[6 marks]**

e. Once a program is written, it should be compiled. Explain the compilation process
                                                                 [2 marks]

f. Define linking.   **[2 marks]**

g. A startup code is a small block of assembly language program that prepares the way for the execution of software written in high level language. Give the steps for the startup codes for c/c++ program.   **[4 marks]**

SECTION B (OPTIONAL 2 OUT OF 4)

QUESTION TWO [20 MARKS]

a. Define a real time system   **[2 marks]**

b. Discuss types of real-time systems   **[8 marks]**

c. Explain five characteristics of real-time systems   **[10 marks]**

QUESTION THREE [20 MARKS]

a. During the manufacturing of embedded systems, what are the design goals of an embedded systems   **[5 marks]**

b. Explain the non-functional requirements of an embedded system   **[8 marks]**

c. Discuss the challenges you would likely face in designing embedded systems
                                                                 [7 marks]

QUESTION FOUR [20 MARKS]

a. Define a design methodology for embedded systems   **[2 marks]**

b. Discuss two methodologies that can be used in designing an embedded system
                                                                 [6 marks]

c. An embedded system is made of several components that enable it to function. Name the components and their function   **[12 marks]**

QUESTION FIVE [20 MARKS]

    a. Discuss five applications of embedded systems   **[10 marks]**
    b. Briefly discuss ten examples of embedded systems   **[10 marks]**