



UNIVERSITY OF COLOMBO, SRI LANKA



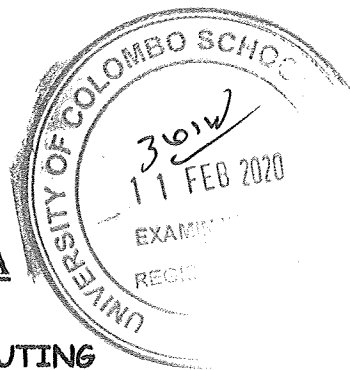
UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Second Year Examination – Semester II – 2019

SCS2213 – Electronic and Physical Computing - (Part B)

TWO (2) HOURS (For both parts A & B)



To be completed by the candidate

Examination Index No:

Important Instructions to candidates:

1. The medium of instructions and questions is **English**.
2. **Write your answers in English.**
3. If a page or a part of this question paper is not printed, please inform the supervisor immediately.
4. Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
5. Write your index number on each and every page of the Question paper.
6. This part of the paper has **02** questions in **8** pages.
7. Answer **ALL** questions. All questions carry equal marks (25 marks).
8. **This paper consists of two parts, Part A (Question No 1 and Question No 2) and Part B (Question No 3 and Question No 4) and submit separately.**
9. Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are **not allowed**.
10. **Non-Programmable** calculators are **allowed**.

For Examiner's use only

Question No	Marks
3	
4	
Total	

Index No:

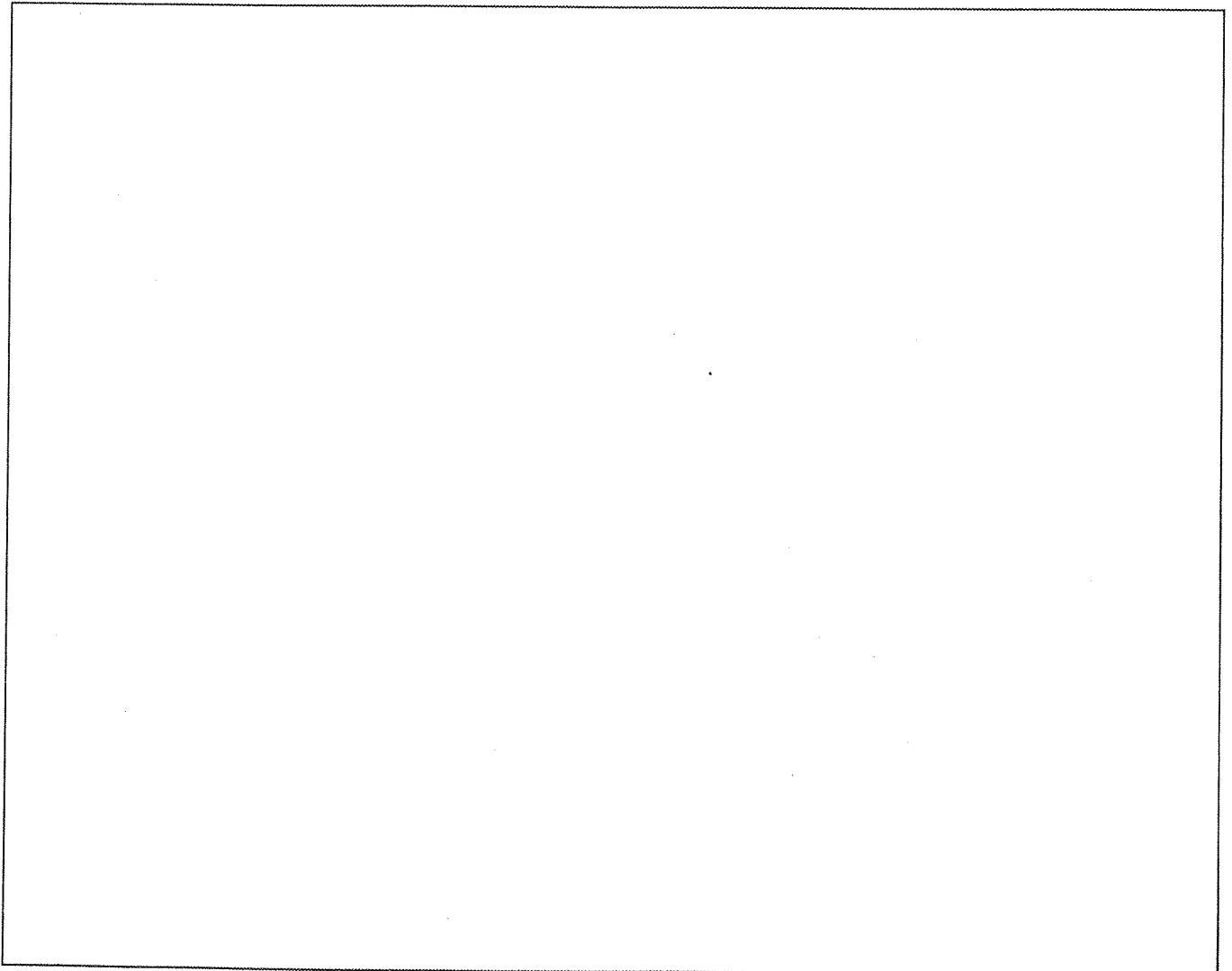
Part B

Question 3

(a) Draw a diagram of Arduino UNO board and name the following components by placing arrows pointing to the components.

- A. ATmega328P microcontroller
- B. USB Port
- C. Analog inputs
- D. External voltage supply
- E. Interrupt pin INT1

[5 marks]



Index No:

(b) Write down three differences between a Microcontroller and a Microprocessor.

[6 marks]

(c) What is the purpose of Program Counter in the processor?

[4 marks]

Index No:

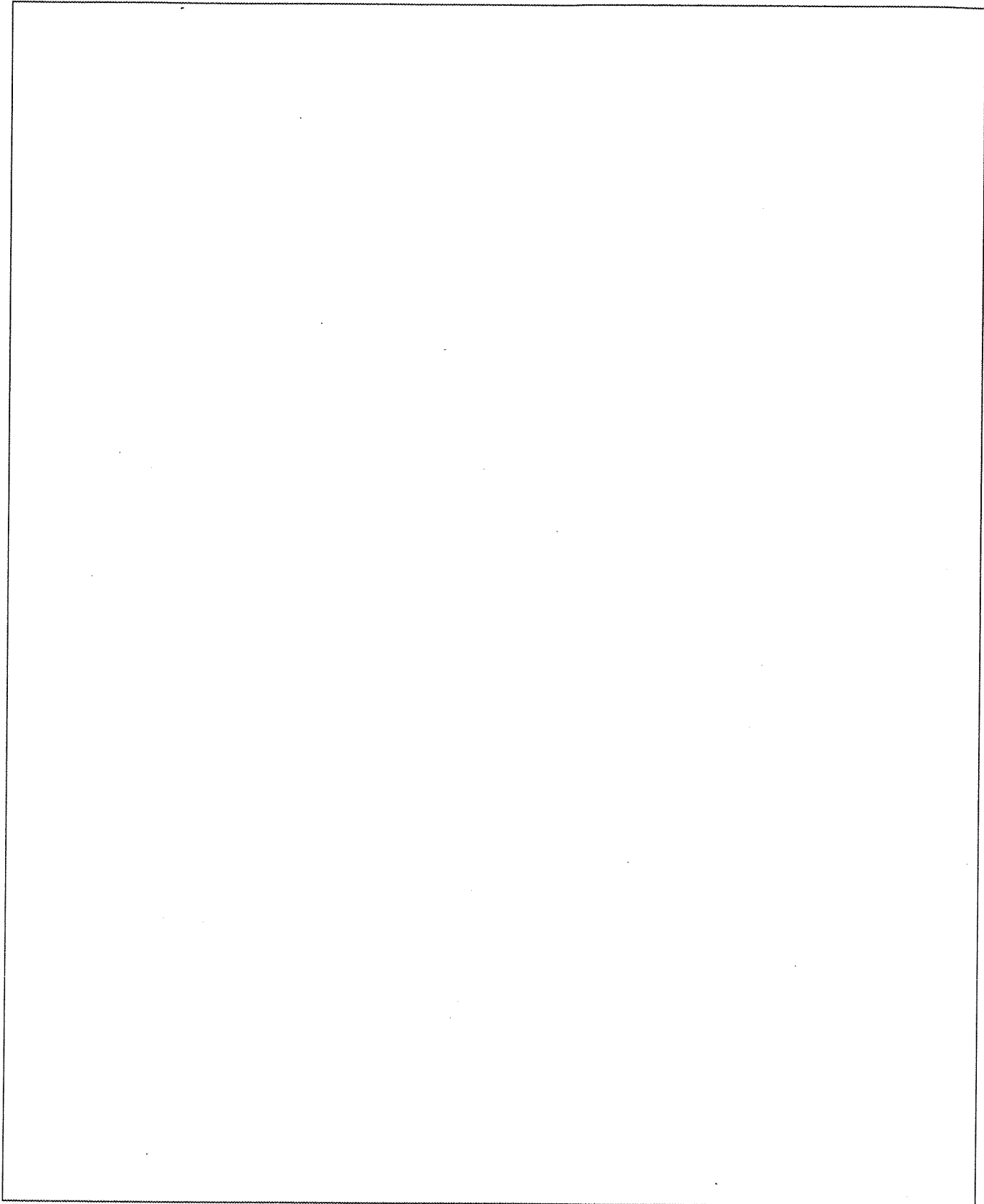
- (d) Arduino program structure consists of two main functions (methods) known as **setup ()** function and **loop ()** function. Write down the main purpose of each of these functions.

[4 marks]

- (e) Draw the circuit diagram and write down the Arduino sketch to blink an LED.

[6 marks]

Index No:



Index No:

Question 4

(a) Write down three advantages of Li-Fi technology.

[5 marks]

(b) Write down the electronic components required to establish a Li-Fi network.

[5 marks]

Index No:

(c) You are recruited as an Engineer for an IT Company which provides innovative solutions to their clients. You are assigned to two projects. One project is building a smart house for disabled persons, and the other project creates solutions for the requirements of an Agricultural company.

(i) In the smart house, disabled persons can give voice commands, and they can do their works. Write down five functions you can automate by the voice commands.

[5 marks]

Index No:

- (ii) Agricultural company has a banana plantation in Athiliwewa, Sri Lanka. They need to have an automated watering system to water the plantation when soil is dry. Write down the sensors and other electronic components required to build the automated watering system.

[5 marks]

- (iii) Agricultural company has mango plantation in Sooriyawewa, Sri Lanka. In there, labourers pick the mangos, and they manually pack them into boxes. The company decided to automate the packing process where labourers pick the mangos and put them on to a conveyor belt. You are required to create a robot system which detects mangoes when mangos are 15cm away from the robot arm and send a signal to operate the robot arm. Write down the sensors and other electronic components you need to implement the system.

[5 marks]
