



PROGRAM : NATIONAL DIPLOMA
ENGINEERING : COMPUTER SYSTEMS
ENGINEERING : ELECTRICAL

SUBJECT : **MICROPROCESSORS 3**

CODE : **CMP 311**

DATE : SUMMER EXAMINATION 2015
17 NOVEMBER 2015

DURATION : (SESSION 1) 08:30 - 11:30

TOTAL MARKS : 100

EXAMINER : A de Jaeger

MODERATOR : Dr. O Oyerinde

NUMBER OF PAGES : 3 PAGES

INSTRUCTIONS

1. ANSWER ALL QUESTIONS
 2. DRAW INTERMEDIATE CIRCUITS
 3. ALL VALUES MUST HAVE THE APPROPRIATE UNITS
 4. CALCULATORS ARE PERMITTED
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Question 1 **[10]**

Explain the following terms in detail:

- Compiling
- Linking
- Building
- Assembling

Show which of the above would be used when programming in:

- C
- C++
- Java
- Assembly language

Question 2 **[10]**

Explain the concept of an interrupt by describing how it would be used for operating a timer.

Question 3 **[10]**

Would a micro-processor be able to function without interrupts?
(Explain fully).

Question 4 **[10]**

What is the difference between synchronous and asynchronous communication? Give the main advantages and disadvantages of each.

Question 5 **[10]**

What are the 3 main “loop” constructs in C and C++?
Give an example of each.
Which one is the most general?

Question 6 **[20]**

Explain each of the following:

- SPI
- I²C
- IrDA
- USART
- PWM

Question 7 **[15]**

Explain how to create a very simple DA converter by using the PWM. Give the main advantages and disadvantages of this method.

What other uses does the PWM have?

Question 8 **[15]**

In C, variables that contain numbers can be defined in a number of different ways. Explain the difference between:

- short
- int
- float
- unsigned

Further describe the impact each of them have on execution speed and memory requirements.

TOTAL **[100]**