



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2016 SEMESTER

COURSE CODE : LED 30303
COURSE NAME : MICROPROCESSOR BASED SYSTEM
PROGRAMME NAME : DIPLOMA IN MARINE ELECTRICAL & ELECTRONIC
(FOR MPU: PROGRAMME LEVEL)
DATE : 18TH MAY 2016
TIME : 2.00 PM – 5.00 PM
DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
 2. This question paper has information printed on both sides of the paper.
 3. This question paper consists of **TWO (2)** sections; Section A and Section B.
 4. Answer **ALL** questions in Section A. For Section B, answer **TWO (2)** questions **ONLY**.
 5. Please write your answers on the answer booklet provided.
 6. Answer should be written in blue or black ink except for sketching, graphic and illustration.
 7. Answer all questions in English language **ONLY**.
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THERE ARE 5 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1 (CLO1)

- (a) No matter how complex microprocessors become, they will still follow the same pattern of operations during program execution. With the aid of diagram, describe what happens during microprocessor operation. **CO1**
(10 marks)
- (b) Explain how the microprocessor responds to special external circumstances.
(10 marks)

Question 2 (CLO2)

- (a) Solve the equation $3(9F \div 5) - (42 \div 8)$ using radix minus two method. Present your final answer in hexadecimal number. (*Show your calculation method*).
(10 marks)
- (b) Solve the equation $6(73_{10} - 105_{10}) + BC$ in binary number. Present your final answer in decimal number. (*Show your calculation method*).
(10 marks)

Question 3 (CLO3)

- (a) Determine the content of data register and the status of condition code register after executing each of the following instructions in sequence.

```
MOVEQ    #$CD, D0
MULU    #2, D0
SWAP     D0
MOVE.L   #$F532467F, D1
EXG      D0, D1
```

Assume that the 68000 is in the supervisor state.

(10 marks)

- (b) Analyze the information given by hex file below and determine the value of XX.

```
S1XX8100227C00008000103C000E4E4F103C00094E4F62
```

(10 marks)

SECTION B (Total: 40 marks)**INSTRUCTION: Answer only TWO (2) questions.****Please use the answer booklet provided.****Question 4**

- (a) Explain the sequence of events when bus error occurs. **CLO4** (10 marks)
- (b) Create a subroutine for VTES 68k using two delay loops. One loop to delay for 1 second, and the other count the number of seconds, in this case is 120. **CLO5**
(10 marks)

Question 5

- (a) Explain the sequence of events for the write cycle in 68000. **CLO4** (10 marks)
- (b) Write a program to find an average of an array as given below:- **CLO5**

```
          ORG      $3000
ARRAY1   DC.W     6, 8, 4, 12, 10
SUM      DS.W     1
          END
```

(10 marks)

Question 6

(a) With an aid of diagram, explain what happen in the synchronous bus operation. **CLO4**
(10 marks)

(b) Create a subroutine to solve the following quadratic equation where the word value for x is stored in D0 and the result of the equation (y) is returned to the lower word of D1.
CLO5 (10 marks)

$$y = (8/2)x^2 - ((10/4) + 7)x + 65$$

END OF QUESTIONS