



MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

**FINAL EXAMINATION
JANUARY 2016 SEMESTER**

SUBJECT CODE : INB34403
SUBJECT TITLE : SYSTEM AND NETWORK PROGRAMMING
LEVEL : BACHELOR
TIME / DURATION : 2.00PM – 4.00PM
(2 HOURS)
DATE : 25 MAY 2016

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consists of TWO (2) sections. Section A and B.
4. Answer ALL questions in Section A. Answer THREE (3) questions in Section B.
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 25 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1 Theory of IPC and Socket**

- (a) The IPC mechanisms can be classified into categories as given below. Briefly describe each and every one.
- (i.) Shared Memory (2 marks)
 - (ii.) Message Queues (2 marks)
 - (iii.) Pipes (2 marks)
 - (iv.) Named Pipe (2 marks)
 - (v.) Semaphore (2 marks)
- (b) Client and Server systems communicate using several system calls. Describe each communication system call and its functions.
- (i.) Socket (2 marks)
 - (ii.) Bind (2 marks)
 - (iii.) Connect (2 marks)
 - (iv.) Listen (2 marks)
 - (v.) Accept (2 marks)
- (d) Using the system call in (c), describe the process of communication between client and server. (5 marks)

[Total Q1: 25 marks]

SECTION B (Total: 75 marks)**INSTRUCTION: Answer THREE (3) questions ONLY.****Please use the answer booklet provided.****Question 2: Data Structure Array**

A simple 2D array contains 100 integer (positive and negative) elements in 10 X 10 configurations.

- a) Write a declaration for **two [2]** of the array above. Named as Array1 and Array2.
(3 marks)
- b) Write a C routine to display all elements of array in matrix format
(7 marks)
- c) Write a C routine to calculate the number of positive elements in the array
(7 marks)
- d) Write a C routine to copy all elements in Array1 to Array2
(8 marks)

[Total Q2: 25 marks]

Question 3: Data Structure struct

A computer technician builds a simple database of all devices under his care. i.e routers, switched, computers. His job includes configuring, initializing, calibrates and repairs all the devices. The database is called "NetDevices".

Items : 1. Router 2. Switches 3. Computers
Location:
Status: 1. OK 2. UnderRepair 3. Broken

Figure Q3: definition for struct of devices

- a) Write a declaration for the struct. (5 marks)
- b) Assuming his database is completed, write a C routine to calculate the number of devices (records) in the file NetDevices. (6 marks)
- c) Write a C routine to count the numbers of each devices and show the status number for each

i.e	1. Router – 10
	1. OK – 9
	2. UnderRepair – 1
	3. Broken - 0

(9 marks)

- d) Write a C routine to display all items in database. (5 marks)

[Total Q3: 25 marks]

Question 4: Data Structure Linked-List

```

struct student{
    id           // 52208123456
    name        // Along bin Abah
    icnum       //950102102343
    course      //Computer Network
    level       //Bachelor
    register    //0114 - 1st sem 2014
}

```

Figure Q4: definition for struct student

A database called "StudDataB" stored all records of students data format – see struct above).

- a) Write a declaration for the student struct above. (5 marks)

- b) Write a declaration for a node of student record of a linked list
(5 marks)
- c) Write a C routine to read from database to a LinkedList.
(15 marks)

[Total Q4: 25 marks]

Question 5: This question deals with struct, array and binary file.

StockFiles structure includes id, name, stocklevel, minStock, buyPrice and sellPrice.

- a) Write a declaration for the stock struct above.
(5 marks)
- b) Write a C routine to open to read and update a binary file called myStockData .
(5 marks)
- c) Write a C routine to calculate the number of records (data) in myStockData.
(5 marks)
- d) Write a C routine to display all records of myStockData in table format.
(10 marks)

[Total Q5: 20 marks]

END OF EXAMINATION PAPER