



NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MAY/JUNE 2012 EXAMINATION

CIT 341 Data Structures (3 CR)

Time Allowed: 3hrs

Instruction: Answer any five (5) questions.

1a Explain the notion of 'Interface' within the context of Java programming language

(6 marks)

1b. List the basic components of a 'Statement'. (3 marks)

1c. State the main goal of the sorting algorithm. (5 marks)

1d. State the hash function for a set of keys, K and a positive constant, M. (6 marks)

2a. State three (3) reasons for suballocations. (9 marks)

2b. What are the characteristics of a good hash function? (3 marks)

2c. Give a brief description of the following:

i. Fragmentation

ii. Best Fit

) (4 marks each, Total=8)

3a. Write a program in Java to declare an integer named day of the week, whose value is

6. The program should display the name of the day of the week using the Switch statement.

(15 marks)

3b. State the principal of optimality. (5 marks)

4a. Draw the queue data structure showing the insertion and deletion. (10 marks)

4b. State the function of the following primitive operation:

i. Add

ii. Set

iii. Remove

iv. Get

v. IndexOf

)
)
) (2 marks each, Total=10)
)
)

5a. List any two (2) reference types.

(4 marks)

5b. Distinguish between public and private modifiers. (4 marks)

5c. Give a brief definition of these terms:

- i. Parameters
- ii. Fields
- iii. Local variables

(4 marks each; = 12 marks)

6a. Name and describe two basic operations of a stack. (16 marks)

6b. Determine the linear expression of DIMY (6, 10) (4 marks)

7a. State four main steps involved in Dynamic programming design. (10 marks)

7b. What is the transpose of the following digraph $G = (V, E)$? (4 marks)

7c. Specify the effect of the following operation on a stack:

- i. IsEmpty
 - ii. IsFull
 - iii. Initialise
- } 2 marks each
(6marks)