Name_____ Index No.____

1920/106
OPERATING SYSTEMS
July 2015
Time: 3 hours

Candidate's Signature_____

Date_____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

OPERATING SYSTEMS

3 hours

INSTRUCTIONS TO CANDIDATES

Write your Name and Index number in the spaces provided above.
Sign and write the Date of examination in the spaces provided above.
*Answer **ALL** the questions in Section A in the spaces provided in this paper.*
*Answer any **FOUR** questions in Section B in the spaces provided in this paper.*
Candidates should answer the question in English.

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	1-10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
Total score			

This paper consists of 10 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

SECTION A (40 marks)

*Answer **ALL** the questions in this section.*

1. Define each of the following terms as used in operating systems:

   (i) buffer; (2 marks)

   (ii) virtual device. (2 marks)

2. Distinguish between *static* and *dynamic* pipelining as used in process management. (4 marks)

3. Distinguish between *disk mirroring* and *disk cloning* as used in disk management. (4 marks)

4. One of the functions of the operating system is to maintain computer security. Explain **two** ways that the operating system uses to achieve this function in a multi-user environment.
(4 marks)

5. Distinguish between *semaphore* and *interface metaphor* as used in operating systems.
(4 marks)

6. Juab recommended the use of redundant array disks in order to improve the performance of the computer system. Give **two** reasons for his recommendations. (4 marks)

7. During an operating systems lesson, the teacher mentioned several similarities between disk operating system and windows operating systems. Outline **four** that he could have mentioned.
(4 marks)

8. Outline the function of each of the following features as used in process management:

(i) message passing; (2 marks)

(ii) process control block. (2 marks)

9. Distinguish between *master* and *slave* disks as used in operating systems. (4 marks)

10. Define each of the following terms as used in memory management:

(i) non-blocking; (2 marks)

(ii) device driver. (2 marks)

SECTION B (60 marks)

Answer any FOUR questions in this section.

11. (a) Explain each of the following terms as used in process management:

(i) hold and wait; (3 marks)

(ii) mutual exclusion. (3 marks)

(b) Josh observed the disk access rate of two machines A and B and noted that it took longer for machine A to read and write than for machine B. Explain **three** factors that could have led to this difference. (6 marks)

(c) Suzy had the following descriptions of different types of operating systems:

(i) operating system that manages a group of independent computers and makes them appear as a single computer;

(ii) operating system designed to operate on small machines like PDAs with less autonomy and limited resources;

(iii) operating system designed to achieve quick and predictable responses to events.

Identify the types of operating systems in (i), (ii) and (iii) above. (3 marks)

12. (a) List **six** examples of utility programs used in Windows operating systems. (3 marks)

(b) With the aid of a diagram, describe the *round robin scheduling algorithm* as used in operating systems. (6 marks)

(c) Scheduling can be categorized as *high level*, *medium level* or *low level*. Explain each of these categories and for each, state the type of process it is best suited to perform. (6 marks)

13. (a) Jose, an ICT officer recommended that his organization should purchase an operating system with a command based interface. Explain **three** advantages of this interface that could have influenced the recommendation. (6 marks)

(b) With the aid of a diagram, describe the *multi-layer architecture* of operating systems. (6 marks)

(c) Explain the circumstance under which an *unsafe state* may occur in process management. (3 marks)

14. (a) Outline **four** advantages of the NTFS file system as used in operating systems. (4 marks)

(b) Describe each of the following placement policies as used in memory management:

(i) direct mapping; (2 marks)

(ii) fully associative; (2 marks)

(iii) set associative. (2 marks)

(c) Figure 1 shows a directory file system. Use it to answer the question that follows.

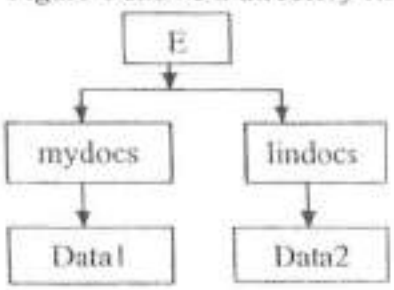

Figure 1

(i) Identify the file system and state **one** advantage of this file system. (2 marks)

(d) Explain the circumstance under which the *plug and play facility* could be most applicable in computer systems. (3 marks)

15. (a) Outline **three** functions of the memory manager in an operating system software. (3 marks)

(b) Jumbo College has invited you to give a lecture on the functions of the software clock in operating systems. Explain **three** functions that you could mention. (6 marks)

(c) With the aid of a diagram, describe the *segmentation memory allocation technique* as applied in operating systems. (6 marks)