1920/106
OPERATING SYSTEMS
November 2016
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

OPERATING SYSTEMS

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **15 (FIFTEEN)** questions in **TWO** sections: **A** and **B**.*
*Answer **ALL** the questions in **section A** and any **FOUR** questions in **section B** in the answer booklet provided.*
Candidates should answer the questions in English.

This paper consists of 4 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. Joy acquired an operating system which she attempted to install on her desktop computer and had the following options displayed.

   (a) repair;

   (b) upgrade.

   Explain a circumstance that would necessitate her to apply each of the options. (4 marks)

2. Explain the function of each of the following terms as used in operating systems:

   (a) job control language; (2 marks)

   (b) command language. (2 marks)

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

   (a) overlays; (2 marks)

   (b) thrashing. (2 marks)

4. Explain **two** benefits of virtual memory in a computer system. (4 marks)

5. Paul bought a laptop computer that he intends to share with his family members. Outline **four** possible measures he could put in place to ensure his data is safe. (4 marks)

6. John created the following files and named them as follows:

   (a) june/1.doc

   (b) port@d.rtf;

   (c) accounts =3.xls;

   (d) june>po.acc.

   State which of the file names would be valid. (4 marks)

7. Distinguish between *optimistic* and *pessimistic* locking as used in concurrent processing by an operating system. (4 marks)

8. Describe each of the following storage placement policies:

   (a) best fit; (2 marks)

   (b) first fit. (2 marks)

9. Distinguish between *pre-emptive* and *non-pre-emptive* scheduling algorithms as used in process management. (4 marks)

10. Define each of the following terms as used in inter- process communication:

    (a) signal; (2 marks)

    (b) pipe (2 marks)

SECTION B (60 marks)

*Answer any **FOUR** questions in this section.*

11. (a) Explain the term *device independence* as applied in I/O device management. (2 marks)

(b) Distinguish between *relative* and *absolute* paths as applied in file management. (4 marks)

(c) With the aid of a diagram describe the *layered* structure of an operating system. (5 marks)

(d) Angela created a file and stored it on a secondary storage medium. Explain **two** possible attributes she could assign to the file. (4 marks)

12. (a) State **one** disadvantage of each of the following process scheduling methods:

(i) first come first served; (1 mark)

(ii) short job first; (1 mark)

(iii) round robin. (1 mark)

(b) Explain the term *direct memory addressing* as applied in device I/O management. (2 marks)

(c) Rebecca intends to compile a report on the techniques that the operating system uses to improve the performance of a disk. Explain **three** techniques that she could include in the report. (6 marks)

(d) Karmas prefers to purchase an operating system with an *NT file* system over the one with a *FAT 32* system. Explain **two** reasons for his preference. (4 marks)

13. (a) Explain the function of each of the following as used in memory management:

(i) address translation; (2 marks)

(ii) associative mapping; (2 marks)

(iii) page table. (2 marks)

(b) With the aid of a diagram, describe *fixed memory partitioning* technique. (4 marks)

(c) With the aid of a diagram, describe the *process control block* as used in inter process communication. (5 marks)

14. (a) Outline **three** conditions of a deadlock in a system. (3 marks)

(b) Explain each of the following terms as used in device I/O management:

(i) device driver; (2marks)

(ii) device controller. (2 marks)

(c) Mr. Ketch intends to purchase a random access memory (RAM) from an IT vendor. Explain **two** types of the memory that he could purchase. (4 marks)

(d) Joy came across the following files that were stored in the system file folder:

(i) config.sys

(ii) autoexec.bat

Explain the function of each of these files. (4 marks)

15. (a) Outline **three** functions of the *system clock* of a computer system. (3 marks)

(b) Differentiate between *dumb* and *intelligent* terminals, giving an example in each case. (4 marks)

(c) Android operating systems have gained popularity in the recent years for use on smart device platforms. Outline **three** features that have contributed to their popularity. (4 marks)

(d) Joel, a student at a certain college compiled a term paper report on the following *disk arm scheduling algorithms:*

(i) C-SCAN;

(ii) Shortest seek time.

Describe each of the algorithms. (4 marks)

THIS IS THE LAST PRINTED PAGE.