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Name: _____ Index No: _____ / _____

1920/106
OPERATING SYSTEMS
November 2013
Time: 3 hours

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.

This paper consists of 15 (FIFTEEN) questions in TWO sections: A and B

Answer ALL the questions in Section A in the spaces provided after each question.

Answer any FOUR questions in Section B in the spaces provided after each question.

Candidates should answer the questions in English

For Examiner's Use Only

| Section | Question | Maximum score | Candidates score |
|-------------|----------|---------------|------------------|
| A | 1-10 | 40 | |
| B | 11 | 15 | |
| | 12 | 15 | |
| | 13 | 15 | |
| | 14 | 15 | |
| | 15 | 15 | |
| Total score | | | |

This paper consists of 11 printed pages

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

SECTION A (40 MARKS)

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

1. (a) Explain the term *scheduler* as used in computer operating systems. (2 marks)

- (b) Distinguish between *multi-tasking* and *multiprocessing* as used in data processing. (3 marks)

2. Outline the function of each of the following as used in operating systems: (3 marks)

- (i) object manager;

- (ii) kernel.

3. Jane's computer has an 8 bit address bus and an instruction format that provides 12 bits in the address part. Calculate each of the following: (4 marks)

- (i) maximum addressable memory range;

- (ii) offset range.

4. Describe each of the following terms as used in operating systems: (4 marks)

(i) relocating loader;

(ii) job control language.

5. (a) State **four** features of the Graphical User Interface. (2 marks)

(b) Distinguish between *distributed operating system* and *real time operating system*. (3 marks)

6. Netcom Company Ltd, a mobile communication device manufacturer intends to install the android mobile operating system in their new devices. Explain **two** advantages the company would gain from using this operating system. (4 marks)



7. Process A had full control of the processor until a given time at which point it lost control of the processor. Explain **two** possible causes that could have led to the loss. (4 marks)

8. Explain the circumstances that could cause a process to be in each of the following stages during program execution: (4 marks)

(i) Ready;

(ii) Blocked.

9. Explain each of the following interrupts stating the circumstance under which each is applicable: (4 marks)

(i) maskable interrupt;

(ii) non-maskable interrupt.



10. (a) Define the term *virtual device* as used in computer operating systems. (1 mark)

(b) Explain **one** advantage of *memory swapping* as used in memory management. (2 marks)

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SECTION B (60 MARKS)

Answer any **FOUR** questions in this section in the spaces provided.

11. (a) State **two** factors to consider when creating a password. (2 marks)

- (b) With the aid of an example of a storage device, explain each of the following terms as used in I/O management: (4 marks)

(i) disk driver;

(ii) disk controller.

- (c) With the aid of a diagram, describe the *round robin* scheduling algorithm. (6 marks)



- (d) A base register X was preloaded with a value of 2000 when an instruction of the form JMP 23 was issued to the register. Calculate the effective address of the register after the instruction had been executed. (3 marks)

12. (a) Define the term *shell* as used in computer operating systems. (1 mark)

- (b) Ken typed each of the following command at the DOS prompt:

(i) CHKDSK;

(ii) C-SCAN.

Explain the operation they would each accomplish when executed. (4 marks)

- (c) With the aid of a diagram, describe the NTFS file structure. (6 marks)



(d) Petra an IT student, came across the following path during revision.

C:\ desktop \ care \ jobs.txt.



Identify each of the parts labeled (i) to (iv). (4 marks)

13. (a) Outline **three** criteria that an operating system would use when scheduling a job. (3 marks)

(b) A teacher in an IT class used the terms *dynamic* and *user* file space allocations. Describe each of these terms as used in computer operating systems. (4 marks)

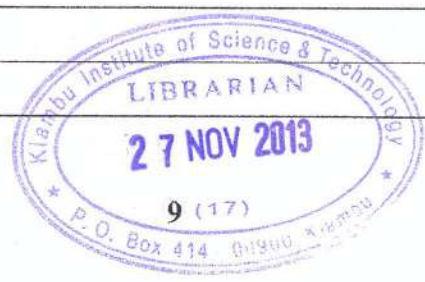


(c) Joan intends to improve the performance of her hard disk. Explain **three** techniques that she could use. (6 marks)

(d) Lara prefers the deadlock prevention strategy over the other strategies. Explain the reason for her preference. (2 marks)

14. (a) During an operating systems class the teacher mentioned various causes of process termination . Explain **three** of these causes. (6 marks)

(b) Locking schemes are categorized as either *pessimistic* or *optimistic* locking. Explain each of these schemes as used in operating systems. (3 marks)



- (c) Figure 1 shows a variable partition memory with hole sizes in the order as indicated.

| | | | | |
|-----|-----|-----|-----|-----|
| 20K | 15K | 40K | 60K | 25K |
|-----|-----|-----|-----|-----|

Figure 1

Assume that a new process of size 25K is to be loaded in the partition, explain how the holes would be filled using each of the following methods:

- (i) best fit method; (2 marks)

- (ii) worst fit method; (2 marks)

- (iii) first fit method. (2 marks)

15. (a) Define the term *monitors* as used in operating systems. (1 mark)

- (b) Explain **two** advantages of segmented systems as used in memory management. (4 marks)

- (c) With the aid of a diagram, describe *direct memory access* (DMA). (6 marks)



- (d) With the aid of a diagram, describe the *paging* technique as used in memory management. (4 marks)

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