

1920/106
OPERATING SYSTEMS
November 2017
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 in the answer booklet provided.

Answer any FOUR of the FIVE 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.

SECTION B (60 marks)

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

11. (a) A hard disk received requests from the disk drive controller for the data in tracks 7, 4, 12, 17 and 20 respectively. Given that the disk has a total of 25 tracks, seek time of 4 msec per track moved and that the head is initially at track 9, calculate the seek time needed for each of the following disk arm scheduling algorithms:
- (i) c-scan;
 - (ii) shortest seek first. (7 marks)
- (b) Distinguish between *job control language* and *assembly language* as used in systems software. (4 marks)
- (c) The operating system schedules jobs for execution. Explain **two** schedulers used for this task. (4 marks)
long term - to determine which program are to be admitted to the system
short term - it increases the system performance in accordance with the chosen
12. (a) Explain each of the following terms as used in operating systems:
- (i) context switch;
 - (ii) file allocation table;
 - (iii) spooling - *is the putting data of* (6 marks)
- (b) A computer system experienced a *deadlock* during inter-process communication, explain **three** methods that the operating system could use to recover from the deadlock. (6 marks)
- Mutual excl. - NO pre-emption -
- Hold and wait - Circular
- (c) A data processing system uses *multiprogramming operating system*. Describe this type of operating system. (3 marks)
13. (a) Classify the following software as either *application software* or *systems software*:
S-S Unix, *S-S* windows ultimate 7, *S-S* android, *AP* database management system, *AP* assembler, *AP* google chrome. (3 marks)
- (b) With the aid of a diagram, describe a *client-server* operating system. (6 marks)
- (c) Each process is represented in the operating system by a *process control block*. Explain **three** items of information contained in the block. (6 marks)
14. (a) Outline **three** reasons why a disk would be formatted. (3 marks)
- (b) Outline **three** data backup methods. (3 marks)

- (c) A commercial bank requires its entire staff to be connected on a network to support time sharing system. Suppose two requests are sent at the same time for processing from different users, describe the execution procedure of the requests using *round robin scheduling algorithm*. (5 marks)
- (d) Explain the term *warm boot* as used in computer systems, giving a situation when it could be necessary. (4 marks)
15. (a) Explain the function of each of the following disk utilities:
- defrag;
 - scandisk. (4 marks)
- (b) The operating system performs various memory management functions. Explain **three** such functions. (6 marks)
- (c) Consider the following set of processes that arrive at time 0 with the length of the CPU burst given in milliseconds.

Process	Burst time
P1	18
P2	6
P3	6

If the processes arrive in the order P2, P3, P1 and are served on *first come first served* basis:

- represent the order in which the process are served using a Gantt chart; (2 marks)
- calculate the *average waiting time*. (3 marks)

THIS IS THE LAST PRINTED PAGE.