

061306T4CSC

COMPUTER SCIENCE LEVEL 6

ICT/OS/CS/CR/02/6

Understand Operating Systems

March/April 2026



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) printed pages

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

SECTION A (40 MARKS)

Answer ALL questions in this section

1. A computer system uses virtual memory to manage its main memory resources efficiently. State TWO advantages of using this technology. (2 marks)
2. Before installing Windows, certain hardware and software conditions must be met. Identify the installation requirements for this operating system. (4 marks)
3. An operating system is organized into components that perform specific functions. List FOUR of its main structures. (4 marks)
4. An office computer is being prepared for use by installing an operating system. Outline FOUR main steps involved during the installation process. (4 marks)
5. When saving files to a disk, the operating system must decide how storage space is assigned. State THREE file allocation techniques used. (3 marks)
6. Indexed access is a file access method employed by the operating system. Outline TWO demerits of using this method. (4 marks)
7. Operating systems evolve through regular release of updates and new versions. Give FOUR reasons for this observation. (4 marks)
8. A new hard disk manual requires that the disk be formatted before use. Give FOUR justifications for this requirement. (4 marks)
9. First Come First Serve scheduling algorithm ensures that the job that comes first gets the CPU first. Identify TWO disadvantages of using this algorithm. (4 marks)
10. A computer system is expected to prevent unauthorized access to important files. Recommend TWO ways in which this can be enforced. (4 marks)
11. File and directory operations are actions provided by the operating system to manage stored data. Outline THREE such operations. (3 marks)

SECTION B (60 MARKS)*Answer THREE questions in this section*

12. a. The minimum number of states a process passes from creation to completion is five. Describe any FIVE states. (10 marks)
- b. Different operating systems are designed to meet specific computing needs in various environments. Explain FIVE types. (10 marks)

13. a. A CPU uses the Round Robin scheduling algorithm with a time quantum of 3 ms. Given the processes below (all arriving at time 0), calculate the turnaround time for each process. (10 marks)

Process	Burst Time
P1	5
P2	7
P3	3

- b. Operating systems are designed to use memory management techniques to ensure efficient use of computer resources. Discuss FIVE such techniques. (10 marks)
14. a. An administrator needs to control user behaviour on a local computer. Describe how local policy settings are configured in the operating system. (4 marks)
- b. A set of processes arrive at the same time and is scheduled using the Shorted Job First algorithm. Calculate the average waiting time. (6 marks)

Process	Burst Time
P1	16
P2	10
P3	14
P4	8

- c. The operating system uses a process control block (PCB) to keep track of a running process. Explain six attributes of a process whose information is stored in the PCB at a given time. (10 marks)
15. a. A computer user observed that an application was not responding. Describe how the problem can be solved using the computer's task manager. (4 marks)

- b. A deadlock is a situation where a process waits infinitely for an unavailable resource. Explain FOUR necessary conditions for its occurrence. (8 marks)
- c. A multi-user computer system runs several applications that require frequent input and output operations. Explain how the operating system manages I/O operations to ensure efficient, safe, and coordinated use of these devices. (8 marks)