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061005T4ICT

ICT TECHNICIAN LEVEL 5

IT/OS/ICT/CR/06/15/A By: And Vocational College

IT/OS/ICT/CR/06/5/B

Manage Operating systems

 $July/August202\\ \text{Pinte d By: And Vocational College Date: 25.07.2025 11:15 AM}$



TVET CURRICULUM DEVELOPMENT ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

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INSTRUCTIONS TO CANDIDATE

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AM

- 1. The paper consists of **TWO** sections: **A** and **B**.
- 2. Answer all questions in section A and ANY THREE (3) questions in section B. Printed By: Technical And Vocational College
- 3. Mearks for each question are indicated in the brackets.
- 4. Candidates are provided with a separate answering odokyletu. And Vocational College

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5. **DO NOT** write on the question paper.

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Printed By: FOUR (5) printed pages

Date a in did a tel shi ou ld check the question paper to ascertain that all pages are printed as indicated and that no questions are missing



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SECTION A (40 MARKS)

An Answer ALL the questions in this section

1. During a manifely of stemisal lesson, at the Federaless encountered the following

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terminologies. Define the terminologies

(4 Marks)

i. Operating system.

ii. Process
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iiiDat**System**ceall1:15 AM

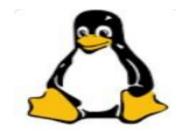
iv. Kernel

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2. Each brand of operating system has a distinctive icon that uniquely identifies it. Associate the following icons with their appropriate Operating systems. (4 marks)

a.



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b.



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d.

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- 3. One of the roles of a device driver is to abstract hardware complexity. Outline THREE other roles of a device driver in operating systems. (3 marks)
- 4. A deadlockritised as components when the number of Prets of Urcessor. List a particular event that will not occur. List FOUR conditions necessary for a deadlock to occur. (4 Marks)
- 5. The field of operating systems is constantly evolving and new trends are emerging Printed By: Technical And Vocational College eyerry 20 to rear day. Name THREE emerging trends in modern operating systems.

(3 Marks)

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- 6. You have been given the responsibility of factreating and ing online course. List TWO security challenges in modern OS that you are likely to encounter and suggest their solutions. (4 Marks)
- 7. Trainees in an operating system class learnt about virtualization. Outline FOUR ways in which virtualization improves OS efficiency? (4 Marks)
- 8. An organization has installed a multitasking operating system in their computers.

 Outline THREE ways in which this operating system manages multitasking. (3 Marks)

 Printed By: Technical And Vocational College
- Date: 9.5.07A2n 25pd rating system is an essential part of any computing system and without which a computer cannot even power up. Identify FOUR reasons why an OS is necessary for a computer system. (4Marks)

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10. Organizing and accessing data is a fundamæantad ota sk250f1:an whomputer system. The primary purpose of 'file system management' within an operating system is to ensure

Printed ile sparized and ease in file access. Identify the THREE file access methods.

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11. The main purpose of a disk scheduler isDatteO: 2ismop .t200 v æ 1 tt:h æ AOMVerall performance and efficiency of disk operations. Outline FOUR roles of a disk scheduler in an operating system.

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SECTION B (60 MARKS)

Answer Any THREE Questions in This Section

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- a) Scheduling Daister R & processes sonsequently making the CPU among processes consequently making the computer more productive. Explain FOUR key criteria used to evaluate the effectiveness of CPU scheduling algorithms in an operating system. (8 marks)
- b) Processes than sitting mathrough different states as they progress through their lifecycle, reflecting their current status. Using a FIVE-STATE process diagram explain how a Printed By: Technical And Voc process transitions through different states d_1u ring d_2u ring d_1u ring d_2u to d_1u (8 marks)
- c) An attachee in an ICT firm realized that his computer hanged when he was playing a computer game while at the same time running network diagnostics. His supervisor told him that the game was preempted. Explain the difference between preemptive and non -preemptive scheduling algorithms giving an example in each case.

14.

Pinted By: Cuoslee de to allocate processor time to processes to ensure

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optimum utilization of the processor and fair distribution of processor time among competing processes. Explain the following algorithms. (6 marks)

a. First Come First Served (FCFS).

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b. Shortest Process Next (SPN).

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c. Shortest Remaining Time (**SRT**)

PineobB), allo de y o garia pah iccoallelye illustrate the differences in the processor

Date: 25.07 s²c⁰lf e d ¹u 1 i⁵n ^{AgM} using the THREE algorithms below indicating waiting time and rinted By: Technical And Vocational College completion time. (6 marks) Date: 25.07.2025 11:15 AM

- a. First Come First Served (FCFS).
- b. Shortest Processe (SIP IN Technical And Vocatoral Colecce
- Shortest Re maining Time (SRT)

Process Arrival Time Required Service Time 3 $_{ extsf{In}}\mathbf{B}_{ extrm{rth}}$ Technical Ar 2_{Vocational} College 6 $_{5}$ G $_{\mathrm{M}}$ 4 4 D 5 5 F 8 2

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> c) An ICT Technician you need to have a good understanding of operating systems. Explain FOUR types of operating system structure. (8 marks)



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15.

- a) The computer clock system is essential for coordinating and managing the timing confequence peraperating say stems. Explain FOUR main functions of a ct o m 5p u te 2 t 2 t 1 d 1 c 1 k 5 s y stems. (8 marks)
- b) A file system is a method used by an operating system to organize, store, retrieve, and manage data on storage devices. Explain THREE Key concepts Printed By: Technical And Vocational College

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 (6 marks)
 - c) To ease the interaction between software applications and hardware devices,

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 input and output (I/O) software system soften include numerous levels. Explain

 FOUR drawbacks to this strategy. (6 marks)

16.

- a) Data in any organization must be kept safe and secure to ensure its privacy,
 confidentiality and integrity. Explain FOUR key File protection and security
 methods in operating systems. (8 marks)
- b) A hard disk with 200 tracks has disk schedulers that receives the read and Printed By Technical And Vocational College

 Date: 25.07.2025 1 1: W 5r iAt Ne requests. The requested tracks, in the order received by the disk scheduler, are 55, 58, 39, 18, 90, 160, 150, 38, 184. Assuming that currently the read/write head is on track 100, use diagrams to show how the requests will be serviced using the following Pd i i's kd sev hnical And Vocational College Date: 25.07.2025 11:15 AM

i. First In First Out (FIFO). (4 marks)

ii. Shortest Service Time First (SSTF). (4 marks)

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Date: 25.07.2025 11:15 AM iii. CSCAN. (4 marks)

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