# Faculty of Engineering
## End Semester Examination May 2025
### EE3CO61 Operating Systems

| Programme | : | B.Tech. | Branch/Specialisation | : | EE |
|---|---|---|---|---|---|
| Duration | : | 3 hours | Maximum Marks | : | 60 |

**Note:** *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

**Section 1 (Answer all question(s))**   Marks CO BL

**Q1.** Which of the following is not a type of operating system?   1  1  1
- ○ Batch
- ○ Multi-programmed
- ○ Real-time
- ● Single-layered

**Q2.** Which language processor translates the entire code before execution?   1  1  1
- ○ Interpreter
- ● Compiler
- ○ Assembler
- ○ Macro Processor

**Q3.** Which of the following is a preemptive CPU scheduling algorithm?   1  2  1
- ○ First-Come-First-Serve (FCFS)
- ○ Shortest Job Next (SJN)
- ● Round Robin (RR)
- ○ None of the above

**Q4.** Which of the following is not a method for handling deadlocks?   1  2  1
- ○ Deadlock prevention
- ○ Deadlock detection
- ○ Deadlock recovery
- ● Deadlock creation

**Q5.** Which type of partitioning allows memory to be allocated dynamically?   1  3  1
- ○ Fixed partitioning
- ● Dynamic partitioning
- ○ Contiguous partitioning
- ○ Segmentation

**Q6.** What is the primary purpose of memory management in an operating system?   1  3  1
- ○ To manage CPU scheduling
- ○ To manage peripheral devices
- ● To allocate and manage system memory efficiently
- ○ To execute user programs only

**Q7.** Which type of memory is used to store frequently accessed data to improve processing speed?   1  4  1
- ● Cache Memory
- ○ Secondary Memory
- ○ Virtual Memory
- ○ Register Memory

**Q8.** What is the primary purpose of virtual memory in an operating system?   1  4  1
- ○ To replace cache memory
- ○ To increase CPU speed
- ● To expand the available memory beyond physical RAM using disk storage
- ○ To manage user permissions

**Q9.** Which of the following is not a disk scheduling algorithm?   1  5  2
- ○ SCAN
- ○ FCFS (First-Come, First-Served)
- ● LRU (Least Recently Used)
- ○ SSTF (Shortest Seek Time First)

**Q10.** Which of the following file-sharing methods is commonly implemented in Linux?　　　1　5　2
- ○ FAT32
- ○ NTFS
- ◉ Network File System (NFS)
- ○ HFS+

## Section 2 (Answer all question(s))

<div align="right">Marks CO BL</div>

**Q11.** Explain the role of a linker in program execution.　　2　1　2

| Rubric | Marks |
|---|---|
| Explanation in brief. | 2 |

**Q12.** What are language processors? What are their main functions?　　3　1　3

| Rubric | Marks |
|---|---|
| Brief explanation of language processors (1.5 marks), Main functions of language processors (1.5 marks) | 3 |

**Q13. (a)** What are macros and macro processors. How do they help in software development?　　5　1　3

| Rubric | Marks |
|---|---|
| What are macros and macro processors (3 marks), How do they help in software development (2 marks) | 5 |

**(OR)**

**(b)** What are the various phases involved in Language Processing Activities ?

| Rubric | Marks |
|---|---|
| Brief explanation of each phases. (one mark for each phase) | 5 |

## Section 3 (Answer all question(s))

<div align="right">Marks CO BL</div>

**Q14.** What is the concept of processes ?　　2　2　1

| Rubric | Marks |
|---|---|
| Briefly explanation about the concept of processes. | 2 |

**Q15. (a)** Describe the concept of inter-process communication (IPC) and its importance in operating systems.　　8　2　3

| Rubric | Marks |
|---|---|
| Concept of inter-process communication (4 marks), Importance of inter-process communication (IPC) in operating systems (4 marks) | 8 |

**(OR)**

**(b)** What are the necessary conditions for a deadlock to occur? Describe the methods for preventing and avoiding deadlocks in operating systems.

| Rubric | Marks |
|---|---|
| What are the necessary conditions for a deadlock to occur (4 marks), Methods for preventing and avoiding deadlocks in operating systems (4 marks) | 8 |

## Section 4 (Answer all question(s))

<div align="right">Marks CO BL</div>

**Q16.** Explain the concept of memory swapping in an operating system.                     4    3    2

| Rubric | Marks |
|---|---|
| Explanation of memory swapping. | 4 |

**Q17. (a)** How do best fit, first fit, and worst fit allocation strategies work in memory management?    6    3    3

| Rubric | Marks |
|---|---|
| Best Fit, First Fit, and Worst Fit allocation strategies working. (2 marks for each) | 6 |

**(OR)**

**(b)** What is the difference between paging and segmentation? How can they be combined?

| Rubric | Marks |
|---|---|
| Difference between paging and segmentation (3 marks). How paging and segmentation can they be combined (3 marks). | 6 |

## Section 5 (Answer all question(s))

                                                             Marks CO BL

**Q18.** What is virtual memory? How does it enhance system performance?          3    4    2

| Rubric | Marks |
|---|---|
| What is virtual memory (1.5 marks), How does it enhance system performance (1.5 marks). | 3 |

**Q19. (a)** What is the role of an operating system in security? What are some common security measures it provides?    7    4    4

| Rubric | Marks |
|---|---|
| What is the role of an operating system in security (3.5 marks)? What are some common security measures it provides (3.5 marks) | 7 |

**(OR)**

**(b)** Explain in detail the organization and function of cache memory in a computer system.

| Rubric | Marks |
|---|---|
| Explain in detail the organization of cache memory in a computer system (3.5 marks). Explain in detail the function of cache memory in a computer system (3.5 marks). | 7 |

## Section 6 (Answer any 2 question(s))

                                                             Marks CO BL

**Q20.** Explain the role of a file manager in an operating system.          5    5    3

| Rubric | Marks |
|---|---|
| Explanation of role of a file manager (5 marks) | 5 |

**Q21.** Describe different file allocation methods and their advantages.          5    5    3

| Rubric | Marks |
|---|---|
| file allocation methods (2 marks). advantages of the methods (3 marks). | 5 |

**Q22.** What are the different disk scheduling algorithms ? Explain in brief.                5    5    3

| Rubric | Marks |
|---|---|
| What are the different disk scheduling algorithms (2 marks). Explain in brief (3 marks). | 5 |

******