



OFFICE OF THE DEPUTY VICE CHANCELLOR  
ACADEMICS, RESEARCH, AND STUDENT AFFAIRS

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# UNIVERSITY EXAMINATIONS

## 2024/2025 ACADEMIC YEAR

### SECOND YEAR SECOND SEMESTER EXAMINATION

## FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

### MAIN EXAM

**COURSE CODE:** COM 223

**COURSE TITLE:** OPERATING SYSTEMS AND  
NETWORKS

**DATE:** 10<sup>th</sup> April 2025

**TIME:** 1100 – 1400 hrs

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### INSTRUCTION TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF PRINTED PAGES

PLEASE TURN OVER

**MAIN EXAM**  
**BCS 223: OPERATING SYSTEMS AND NETWORKS**  
**STREAM: BSc (Computer Science)** **DURATION: 3 Hours**

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**INSTRUCTIONS TO CANDIDATES**

- i. Answer **ALL** questions from section A and any **THREE** from section B.
- ii. Maps and diagrams should be used whenever they serve to illustrate the answer.
- iii. Do not write on the question paper.

**SECTION A (24 MARKS) COMPULSORY**

**QUESTION ONE** **[12 MARKS]**

- a) Explain the functions of the following network components
- i. Network Media [1 Mark]
  - ii. Server [1 Mark]
  - iii. Client [1 Mark]
  - iv. Repeater [1 Mark]
  - v. Router [1 Mark]
- b) Describe any **TWO** types of memory fragmentation. [2 Marks]
- c) Describe any **FOUR** types of operating system. [2 Marks]
- d) Discuss any **THREE** global impact of computer networks on global business. [3 Marks]

**QUESTION TWO** **[12 MARKS]**

- a) Explain **THREE** advantages of an optical fiber network media. [6 Marks]
- b) Describe the peer to peer type of network. [2 Marks]
- c) Discuss any **FOUR** functions of the operating system. [4 Marks]

**SECTION B** **{36 MARKS}**

**QUESTION THREE** **[12 MARKS]**

- a) Explain with examples any **THREE** types of network device identities. [6 Marks]
- b) Describe the concept of dynamic memory partitioning hence differentiate between Best Fit, Next Fit and First Fit placement algorithms. [4 Marks]
- c) Discuss any **TWO** possible events that may cause interruption of the CPU activities. [2 Marks]

**QUESTION FOUR** [12 MARKS]

- a) A computer system has 202 tracks and it receives random read/write requests. The order of the requests received by the disk scheduler is 57, 60, 41, 20, 92, 162, 152, 40, 186. Assuming that the read/write head is currently on track 102, represent in a Cartesian plane, the movement of the read/write head where the following disk scheduling algorithms are used. [4 Marks]
- i. First In First Out
  - ii. Shortest Service Time First
  - iii. SCAN (LOOK)
  - iv. C-SCAN
- b) Discuss the **FOUR** key pillar of a good computer network design. [4 Marks]
- c) Explain any **FOUR** ways of implementing physical network security. [4 Marks]

**QUESTION FIVE** [12 MARKS]

- a) Consider a computer system that uses batch process scheduling. The table contains details of process identity, process arrival time and service time. Use a Cartesian plane to illustrate the output of the following scheduling algorithms. [4 Marks]

Process	Arrival Time	Service Time
A	0	3
B	2	6
C	4	4
D	6	5
E	8	2

- i. First Come First Served

- ii. Shortest Process First
- iii. Shortest Remaining Time
- iv. Round Robin (RR)

- b) Explain any TWO roles of protocols in network communication. [4 Marks]
- c) Describe the role of the kernel in operating systems. [4 Marks]

**QUESTION SIX** [12 MARKS]

- a) Explain process starvation how it occurs and how it can be prevented. [4 Marks]
- b) Differentiate between a Router and a Network Switch. [4 Marks]
- c) Discuss any **FOUR** approaches used by operating systems to remove process deadlock once it has been detected. [4 Marks]

**QUESTION SEVEN** [12 MARKS]

- a) Describe any **THREE** important skills of a good network administrator. [3 Marks]
- b) Highlight any **THREE** challenges encountered when setting up and maintaining a computer network. [3 Marks]
- c) Describe with the aid of a suitable diagram, the transitions and causes of transitions between process states in a **SIX** state process model. [6 Marks]

\_\_\_\_\_ END OF EXAM \_\_\_\_\_