
CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA
IN COMPUTER SCIENCE

COSC 0120: OPERATING SYSTEMS

STREAMS: DIP. COMP.SCI (Y1S2)

TIME: 2 HOURS

DAY/DATE: THURSDAY 11/4/2019

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

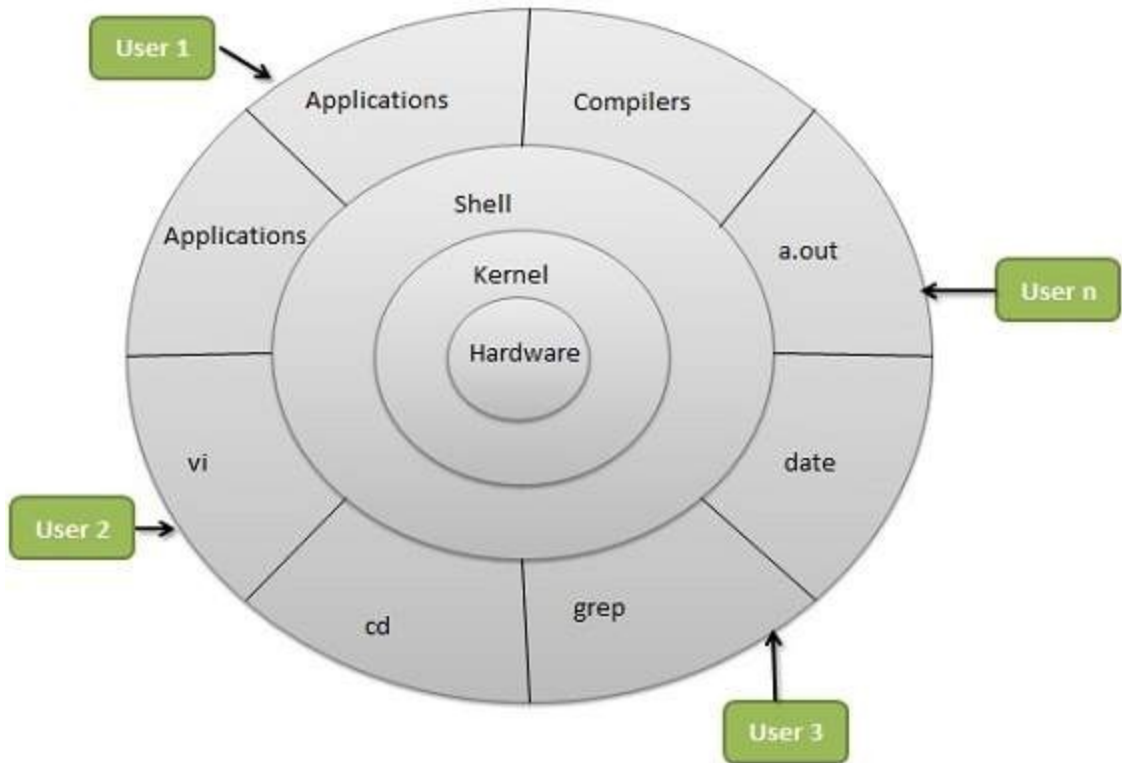
- Answer all in question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, no reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.

SECTION A: ANSWER ALL QUESTION IN THIS SECTION

Question one (30 marks)

- What is an Operating System ?, Provide THREE modern OS examples [4 Marks]
- List FOUR important FUNCTIONS of an OS in modern computers [4 Marks]
- [What inconveniences can a user face while interacting with a computer system, which is without an operating system?](#) [2 Marks]
- [What is the Difference between a Job and a Process?](#) [2 Marks]
- [What are the advantages of multiprogramming?](#) [4 Marks]
- What is a process scheduler? [2 Marks]
- State at least THREE well known PROGRAMME THREATS to modern Operating Systems? [3 Marks]
- Define System Architecture and provide MS-DOS structure [4 Marks]

i. The following illustration shows the architecture of a Linux system



Explain The architecture of above Linux System by layers [5 Marks]

SECTION B (ANSWER ANY TWO QUESTIONS ONLY)

Question TWO (20 marks)

- a. [What is Shortest Remaining Time/SRT scheduling?](#) [2 Marks]
- b. Consider the following 4 jobs

Job	Arrival Time	Burst Time
1	0	7
2	1	4
3	3	9
4	4	5

Using SRT/Shortest Remaining Time scheduling, perform

- i. GANT Chart representation of above jobs [4 Marks]
- ii. Using Gant chart, calculate Average turnaround time for each of the jobs above and overall average turnaround time [8 Marks]

- c. List TWO advantages and disadvantages each for the SRT Scheduling above [6 Marks]

Question THREE (20 marks)

- a. State and explain FIVE the differences between paging and segmentation?

- b. Explain the following allocation algorithms [10 Marks]
- i. First Fit
 - ii. Best fit
 - iii. Worst fit
 - iv. Buddy's system
 - v. Next fit
- c. When does a page fault occur? Explain various page replacement strategies/algorithms. [5 Marks]

Question FOUR (20 marks)

- a. Explain semaphores and BRIEFLY provide short notes it. [6 marks]
- b. Using C ,implement a semaphore operation that ensures mutual exclusion among concurrent processes [10 marks]
- c. Describe the Banker's algorithm [4 marks]

Question FIVE (20 marks)

- a. Describe the Four Generation of Operating Systems via History [8 marks]
- b. What are the advantages and disadvantages of the following OPERATING SYSTEMS Types [12 marks]
- (i) Batch Operating System [2 marks]
 - (ii) Time Sharing Operating Systems [2 marks]
 - (iv) Distributed Operating System [2 marks]
 - (v) Network Operating System [2 marks]
 - (vi) Real Time Operating [2 marks]

