



COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCSC 211 OPERATING SYSTEM

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2019

LECTURER: MISS L TEMBANI

DURATION: (3 HRS)

INSTRUCTIONS

Answer **ALL QUESTIONS** from **Section A (COMPULSORY)**

Answer any **THREE** questions from **Section B**

All questions carry equal marks (25)

Section A (compulsory, answer ALL questions)

Question One

- i. List and explain any 5 functions of an Operating systems [5 marks]
- ii. Explain any 3 types of Operating systems [6 marks]
- iii. With the aid of a diagram outline and explain the process attributes [14 marks]

Section B (answer any three (3) questions)

Question Two

- a) Consider the following system snapshot using data structures in the Banker's algorithm, with resources A, B, C, and D, and processes P1 to P5:

	MAXIMUM				ALLOCATION				NEED				AVAILABILITY			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
P1	6	0	1	2	4	0	0	1					3	2	1	2
P2	1	7	5	0	1	1	0	0								
P3	2	3	5	6	1	2	5	4								
P4	1	6	5	3	0	6	3	3								
P5	1	6	5	6	0	2	1	2								

Using Banker's algorithm, answer the following questions.

- i) How many resources of type A, B, C, and D are there? [6 marks]
- ii) What are the contents of the Need matrix? [6 marks]
- iii) Is the system in a safe state? Why [3 marks]

- b.) A system contains 10 units of resource type R1. The resource requirements of three user processes P1, P2 and P3 are as follows;

	P1	P2	P3
Maximum requirements	8	7	5
Current allocation	3	1	3
Balance requirements	5	6	2
New request made	1	0	0

Using Banker's algorithm, determine if the projected allocation state is safe and whether the request of P1 will be granted or not. [10 marks]

Question Three

Using examples, explain the following classical synchronization problem

- a. Dining philosophers problem
- b. Readers writers problem
- c. Critical section problem
- d. Consumer-Producer Problem
- e. Cigarette-Smokers Problem

[25 marks]

Question Four

- a) Table below shows a set of processes and the associated burst time

Process	Burst time
P1	16
P2	13
P3	14
P4	23
P5	37
P6	2
P7	18

Compute the average waiting time when each of these algorithms is used. For each of the algorithms show the total waiting time. Assume a quantum of 15. [13 marks]

- b) Describe the four strategies of dealing with deadlock [12 marks]

Question Five

Describe the evolution of operation systems up to the 20th century. [25 marks]

Question Six

- a) Describe two file system implementations that use linked lists. Describe the advantages and disadvantages of each method. [12 marks]

- (b) Describe the I-node method of implementing a file system [8 marks]

- (c) It has been suggested that the first part of each UNIX file be kept in the same disk block as its I-node. What, if any, would be the advantage of doing this? [5 marks]

END OF EXAMINATION