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University Examinations 2018/2019

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

CIT 3200: OPERATING SYSTEMS

DATE: SEPTEMBER, 2019

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions.

QUESTION ONE (30 MARKS)

- a) State three computer resources that are likely to be a deadlock. (3 Marks)
- b) State three goals /objectives of Input Output Device management. (3 Marks)
- c) Define the following terms as used in operating system (3 Marks)
 - (i) Busy waiting
 - (ii) Buffering
 - (iii) Critical section
- d) Using a practical example of operating system processes, explain cascade termination. (3 Marks)
- e) Explain three factors to consider when deciding a good scheduling algorithm.(6 Marks)
- f) Explain three essential requirements for long term storage. (6 Marks)
- g) Differentiate between the following terms as used in Operating systems (4 Marks)
 - (i) Preemptive and Non preemptive resources
 - (ii) Deadlock and Live Lock
- h) When virtual memory is implemented in a computing system, there are certain costs associated with the technique, and certain benefits. Explain one cost and one benefit (2 Marks)

QUESTION TWO (20 MARKS)

- a) State four devices under the control of the Operating System. (4 Marks)
- b) Resource preemption is one way of recovering from a deadlock. Explain three considerations that the operating system must make before carrying out resource preemption. (3 Marks)
- c) Explain the concept of Direct Memory Access (DMA) with respect to I/O device management. (5 Marks)
- d) Using well labeled diagram describe four operating system structures. (8 Marks)

QUESTION THREE (20 MARKS)

- a) State five roles of clock software. (5 Marks)
- b) With the aid of a well labeled diagram explain the five state model. (5 Marks)
- c) Discuss the concept of spooling (5 Marks)
- d) Explain how the dining philosopher situation can lead to a race condition (5 Marks)

QUESTION FOUR (20 MARKS)

- a) Explain time slicing and how its duration affects the overall working of the system. (4 Marks)
- b) Explain four principle events that lead to process creation (8 Marks)

- c) Consider the traffic deadlock depicted in the figure above

- d) Explain how the four necessary conditions for deadlock indeed to hold in this example
(8 Marks)

QUESTION FIVE (20 MARKS)

- a) Describe the concept of polling with regard to I/O management (4 Marks)
b) Discuss three ways of achieving mutual exclusion. (6 Marks)
c) Describe the following page replacement algorithms pointing out their weaknesses (6 Marks)
(i) Last recently used (LRU)
(ii) First in First out (FIFO)
d) Below is a set of processes available for execution in a programmed environment:

Process	Burst time	Arrival time
1	3	0
2	5	2
3	4	4
4	1	6
5	2	8

Construct a Gantt chart using Highest Response Ratio .Next show your working

(4 Marks)