

**Question paper**

Course: 16CA206 - Operating Systems

Event: BCA - December 2018



DAYANANDA SAGAR UNIVERSITY

USN No: **III Semester BCA Examinations - December 2018 / January 2019****Course Title:** Operating Systems**Course Code:** 16CA206**Duration:** 03 Hours**Date:** 02-01-2019**Time:** 10:00 AM to 01:00 PM**Max Marks:** 60

- Note:**
1. Answer 5 full questions choosing one from each Section
 2. Each Section carries 12 Marks
 3. Draw neat sketches wherever necessary
 4. Missing Data may be suitably assumed

SECTION - 1

- 1.a. What is Operating System? Explain Operating System as Resource Manager. (05 Marks)
- 1.b. What are System Calls? Give description for types of System Calls. (03 Marks)
- 1.c. Explain booting process in Linux Operating System. (04 Marks)

OR

- 2.a. Explain Operating System Services. (04 Marks)
- 2.b. Give the description about design and implementation of operating system in Multicore and Multichip systems. (05 Marks)
- 2.c. Write short notes on Virtual Machines. (03 Marks)

SECTION - 2

- 3.a. What is Process? Explain the process states with a neat diagram. (04 Marks)
- 3.b. What is Critical Section Problem? Explain how Peterson's Solution works for Critical Section Problem. (05 Marks)
- 3.c. Explain the schematic view of Monitors. (03 Marks)

OR

- 4.a. Explain Synchronization Hardware with respect to Test_and_Set Instruction. (05 Marks)
- 4.b. Explain the role of Interprocess Communication in message passing. (03 Marks)
- 4.c. Explain Dining Philosophers Problem of Synchronization. (04 Marks)

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**SECTION - 3**

5.a. Write short notes on Pthreads. (02 Marks)

5.b. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds. (10 Marks)

Process Burst Time Priority

P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

- Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority), and Round Robin (quantum = 1) scheduling.
- What is the turnaround time of each of the scheduling algorithms?
- What is the waiting time of each process for each of the scheduling algorithms?
- Which of the schedules in part a results in the minimal average waiting time (over all process).

OR

6.a. Write short notes on. (06 Marks)

- Batch systems
- Interactive systems

6.b. Explain Readers-Writers' problems along with programming solutions (06 Marks)

SECTION - 4

7.a. What is Deadlock? State the necessary conditions for deadlock occurrence. (03 Marks)

7.b. Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, or seven frames? (09 Marks)

- LRU replacement
- FIFO replacement
- Optimal replacement.

OR

8.a. Explain Banker's algorithm for deadlock avoidance. (06 Marks)

8.b. What is thrashing? How does the system detect thrashing? What can the system do to eliminate this problem? (06 Marks)



SECTION - 5

- 9.a. Write short notes on. (06 Marks)
(i) Para virtualization (ii) I/O Virtualization
9.b. Explain Windows Virtualization concept. (06 Marks)

OR

- 10.a. Explain how Virtual Machines help on Multicore CPUs. (06 Marks)
10.b. Write short notes on. (06 Marks)
(i) Type 1 Hypervisors (ii) Type 2 Hypervisors



Question paper

Course: 16CA206 - Operating Systems

Event: BCA - December 2018

Course: 16CA206 - Operating Systems

Event: ODD SEM BCA (DEC 2017)

**DAYANANDA SAGAR UNIVERSITY**USN No: **III Semester BCA Examinations – December 2017****Course Title:** Operating Systems**Course Code:** 16CA206**Duration:** 03 Hours**Date:** 29-12-2017**Time:** 10:00 AM to 01:00 PM**Max Marks:** 60

- Note:**
1. Answer 5 full questions choosing one from each section
 2. Draw neat sketches wherever necessary
 3. Missing Data may be suitably assumed

SECTION – 1

- 1.a. What is Operating System? Explain about operating system services. (05 Marks)
- 1.b. Explain booting in Windows Operating System. (04 Marks)
- 1.c. Write short notes on Virtual Machines. (03 Marks)

OR

- 2.a. Explain in detail Operating system generations. (04 Marks)
- 2.b. Explain Operating system calls and its types. (04 Marks)
- 2.c. Explain the basic concepts of Process and File. (04 Marks)

SECTION – 2

- 3.a. What is Process? Explain its concept of process creation and termination in detail. (05 Marks)
- 3.b. Explain Interprocess Communication using message passing. (05 Marks)
- 3.c. What is race condition? Explain in detail. (02 Marks)

OR

- 4.a. Explain Synchronization Hardware with respect to Compare_and_Swap Instruction. (04 Marks)
- 4.b. Explain in detail about Monitors and its Implementation. (03 Marks)
- 4.c. What is Critical Section Problem. Explain how Peterson's Solution works for Critical Section Problem. (05 Marks)

(P.T.O.)

SECTION – 3

- 5.a. Explain the concept of Multicore programming in Threads. (03 Marks)
- 5.b. Explain in detail Bounded-buffer Problem of Synchronization. (06 Marks)
- 5.c. Write short notes on Interactive systems. (03 Marks)

OR

- 6.a. Write short notes on Pthreads. (02 Marks)
- 6.b. Explain in detail Readers and Writers Problem of Synchronization. (04 Marks)
- 6.c. Explain one of the following scheduling algorithms with example: (06 Marks)
- (i) Priority scheduling (ii) Round Robin scheduling

SECTION – 4

- 7.a. Explain 4 criteria's of deadlock prevention. What is purpose of resource allocation graph? (04 Marks)
- 7.b. Consider the following page reference string:
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
Assuming three frames are initially empty, How many page faults would occur for the following replacement algorithms: (06 Marks)
- (i) LRU (ii) FIFO (iii) Optimal
- 7.c. Explain two differences between Internal and external fragmentation. (02 Marks)

OR

- 8.a. Explain the concept of Contiguous allocation method of disk block with a neat diagram in detail. (04 Marks)
- 8.b. Explain the structure of page table and its types in detail. (04 Marks)
- 8.c. What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem? (04 Marks)

SECTION – 5

- 9.a. Write short notes on: (09 Marks)
- (i) Para virtualization (ii) Memory Virtualization
(iii) I/O Virtualization
- 9.c. Explain how Virtual Machines helps on Multicore CPUs. (03 Marks)

OR

- 10.a. Write short notes on: (07 Marks)
- (i) Type 1 Hypervisors (ii) Type 2 Hypervisors
- 10.b. Explain Windows Virtualization concept. (05 Marks)



Internal Question Paper I

Class: III Semester, BCA
Course: Operating Systems
Course code: 16CA206

Date: 13/09/2019
Time: 2:30 to 4:00pm
Max. Marks: 50

Note: Answer any FIVE full questions

Q. No.	Questions	Marks
1	Discuss in detail about operating system generations	10
2	Explain operating System calls and its types	10
3	i) Discuss the services provided by operating system ii) What is system boot? Explain Booting in different Operating Systems	10
4	i) Discuss the importance of Operating System interfaces ii) Give the description of design and implementation of Operating System	10
5	What is meant by Virtual Machine? Explain different methodologies of implementing virtualization and different types of virtual machines with neat diagrams	10
6	i) Explain the process creation and termination ii) What is process? Write and explain the process states with a neat diagram	10



DAYANANDA SAGAR UNIVERSITY

USN No: ENG18CA0009

III Semester BCA Examinations – December 2019 / January 2020

Course Title: Operating Systems

Course Code: 16CA206

Duration: 03 Hours

Date: 03-01-2020

Time: 10:00 AM to 01:00 PM

Max Marks: 60

- Note:**
1. Answer 5 full questions choosing one from each Section
 2. Each Section carries 12 Marks
 3. Draw neat sketches wherever necessary
 4. Missing Data may be suitably assumed

SECTION – 1

- 1.a. Explain Operating System generations. (08 Marks)
- 1.b. Discuss the importance of Operating System interfaces. (04 Marks)

OR

- 2.a. What is meant by system call? Explain different types of system calls. (08 Marks)
- 2.b. Discuss the significance of Operating System Debugging. (04 Marks)

SECTION – 2

- 3.a. What is process? Explain the concept of process creation and termination. (06 Marks)
- 3.b. Write short notes on the following: (06 Marks)
- (i) Process Hierarchies
 - (ii) Race condition
 - (iii) Synchronization Hardware

OR

- 4.a. Illustrate and elaborate the concept of Semaphores. (06 Marks)
- 4.b. Discuss the concept of atomic transactions. (06 Marks)

SECTION – 3

- 5.a. Classify the different Multithreading model. (04 Marks)
- (P.T.O)

- 5.b. Discuss the issues to consider with multithreaded programs. (04 Marks)
- 5.c. Explain process synchronization using Readers – writer's problem. (04 Marks)

OR

- 6.a. Demonstrate Shortest Job First, Priority and Round Robin Scheduling by taking suitable example. (06 Marks)
- 6.b. Differentiate between multilevel queue scheduling and multi-level feedback queue scheduling mechanism. (03 Marks)
- 6.c. Specify how the scheduling is done in Windows XP. (03 Marks)

SECTION – 4

- 7.a. Illustrate deadlock detection and recovery mechanism. (05 Marks)
- 7.b. Explain the concept of paging hardware with translation look aside buffer. (04 Marks)
- 7.c. Compare three types of dynamic allocation strategies. (03 Marks)

OR

- 8.a. State the need of page replacement. Discuss the significance of different page replacement policies. (07 Marks)
- 8.b. Write short notes on the following. (05 Marks)
- (i) Thrashing (ii) Segmentation

SECTION – 5

- 9.a. What is meant by Virtualization? List the requirements for Virtualization. (03 Marks)
- 9.b. Compare and contrast Type1 and Type 2 Hypervisors. (06 Marks)
- 9.c. Specify how virtual machines concept useful for multi core CPUs. (03 Marks)

OR

- 10.a. Explain Para virtualization, memory virtualization and I/O Virtualization in detail. (09 Marks)
- 10.b. Write short notes on Virtual Appliances and licensing Issues. (03 Marks)



Internal Question Paper III

Class: III Semester, BCA
Course: Operating Systems
Course code: 16CA206

Date: 23/11/2019
Time: 2:30 to 4.00pm
Max. Marks: 50

Note: Answer any FIVE full questions

Q. No.	Questions	Marks
1.	i. Explain in detail about monitor concept and its implementation ii. Illustrate the concept of Buddy system	6 4
2.	i. Discuss the concept of atomic transactions ii. Discuss the issues to consider with multithreaded programs	6 4
3.	i. What is Deadlock? State the necessary conditions for deadlock occurrence ii. Explain Banker's algorithm for deadlock avoidance.	5 5
4.	i. Explain Readers-Writers' problems along with programming solutions ii. Illustrate the concept of Semaphores	6 4
5.	What is thrashing? How does the system detect thrashing? What can the system do to eliminate this problem?	10
6.	Discuss the significance of resource allocation graph in deadlock avoidance and in deadlock detection techniques	10

Date: 23/10/2019
Time: 2:30 to 4.00pm
Max. Marks: 50

Q. No.	Questions	Marks																		
	<p>Consider the following set of processes, with the length of the CPU-burst time given in milliseconds.</p> <table border="0"> <tr> <td>Process</td> <td>Burst Time</td> <td>Priority</td> </tr> <tr> <td>P1</td> <td>5</td> <td>4</td> </tr> <tr> <td>P2</td> <td>8</td> <td>5</td> </tr> <tr> <td>P3</td> <td>4</td> <td>3</td> </tr> <tr> <td>P4</td> <td>6</td> <td>4</td> </tr> <tr> <td>P5</td> <td>3</td> <td>2</td> </tr> </table> <p>1. The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.</p> <ol style="list-style-type: none"> Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and Round Robin (quantum = 3 ms) scheduling. What is the turnaround time of each of the scheduling algorithms? What is the waiting time of each process for each of the scheduling algorithms Which of the schedules in part a results in the minimal average waiting time (over all process). 	Process	Burst Time	Priority	P1	5	4	P2	8	5	P3	4	3	P4	6	4	P5	3	2	10
Process	Burst Time	Priority																		
P1	5	4																		
P2	8	5																		
P3	4	3																		
P4	6	4																		
P5	3	2																		
2	<p>a. Write short notes on.</p> <ol style="list-style-type: none"> Batch systems Interactive systems Thread Systems <p>b. Explain the following</p> <ol style="list-style-type: none"> Fixed sized partitions variable sized partitions 	5 5																		

3	<p>a. Differentiate between multilevel queue scheduling and multi-level feedback queue scheduling mechanism</p> <p>b. Specify how the scheduling is done in Windows XP</p>	4 6
4	<p>Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following replacement algorithms, assuming three and four frames?</p> <p>(i) LRU replacement</p> <p>(ii) FIFO replacement</p> <p>(iii) Optimal replacement.</p>	10
5	<p>(i) Explain the concept of paging with translation look aside buffer</p> <p>(ii) Discuss the significance of different types of Page Tables with diagrams</p>	4 6
6	<p>(i) Discuss the concept of segmentation by taking suitable example</p> <p>(ii) Compare and contrast Type 1 and Type 2 Hypervisors</p>	5 5