ROLL NO:	

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 40 Max Time: 1 hr. Saturday, 22nd September, 2018

TEST – 1

Odd Semester 2018-19 Course: **CSE 210 Operating Systems** V Sem. CSE

Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A

(3 Q x 4 M = 12 Marks)

1. What is a System Call? What are the different types of System Calls? Give examples. (1+3)
2. Explain the Microkernel structure of an OS with a diagram (2+2)
3. What are the two communication models for processes? Explain any one with a diagram. (1+2+1)

Part B

(2 Q X 8 = 16 Marks)

4. What are the services offered by an Operating System? Explain with a diagram. (4+4)
5. a) A program is passive but a process is active. Explain. (3)

   b) Explain a process in memory with a neat diagram. (2.5 + 2.5)

Part C

(1Q x 12 M = 12 Marks)

6. a) Under what circumstances does a multithreaded solution using multiple kernel threads provide better performance than a single-threaded solution on a single-processor system? (3)

   b) Explain the different multithreading models with diagrams. (9)

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SET B

TEST 2

Odd Semester: 2018-19
Course Code: CSE 210
Course Name: Operating System
Branch & Sem: CSE & V Sem

Date: 24 November 2018
Time: 1 Hour
Max Marks: 40
Weightage: 20%

Instructions:

(i) ***Read the question properly and answer accordingly.***
(ii) ***Question paper consists of 3 parts.***
(iii) ***Scientific and Non-programmable calculators are permitted***

Part A

Answer **all** the Questions. **Each** question carries **four** marks. (3x4=12)

1. What is Turn-around time and Waiting time of a process? (2+2)
2. Distinguish short-term and long-term scheduler. (2+2)
3. What is racing? Explain with an example. (1+3)

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (2x8=16)

4. What are the problems encountered with the use of semaphores for process synchronization? Illustrate with suitable examples. Explain how are they overcome.
5. Explain how semaphores can be used to solve the Bounded-buffer problem. Give the code for producer and consumer process

Part C

Answer the Question. Question carries **twelve** marks. (1x12=12)

6. Consider the following set of processes, with the length of CPU burst given in milliseconds

Process	Burst Time	Priority
P1	2	2
P2	1	1
P3	8	4
P4	4	2
P5	5	3

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

a) Draw three Gantt charts that illustrate the execution of these processes using the following scheduling algorithms. FCFS, SJF, non- preemptive priority scheduling(a smaller priority number implies a higher priority)

b) What is the turnaround time of each process for each of the scheduling algorithms in part a?

c) What is the waiting time of each process for each of these scheduling algorithms?

d) Which of the following algorithm results in the minimum average waiting time (over all processes)?

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SCHOOL OF ENGINEERING SET A

TEST 2

Odd Semester: 2018-19 **Date**:24 November 2018

Course Code: CSE 210 **Time**: 1 Hour

Course Name: Operating Systems **Max Marks**: 40

Branch & Sem: CSE & V Sem **Weightage**: 20%

Instructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **four** marks. (3x4=12)

1. Briefly explain the different scheduling criteria for CPU scheduling
2. Explain with an example the multilevel feedback queue scheduling
3. Describe the Race Condition with an appropriate example

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (2x8=16)

4. Discuss the Peterson's solution for the Critical Section problem
5. What is a Semaphore? Explain the solution to Bounded Buffer problem using Semaphores

Part C

Answer the Question. Question carries **twelve** marks. (1x12=12)

6 a. Consider the following snapshot of the Processes 8 Marks

Process	Arrival Time	CPU Time (ms)	Priority
P1	0	7	2
P2	2	6	1
P3	3	3	2
P4	5	5	1

Calculate the Average waiting Time and Average Response time after executing the processes with the below Scheduling Algorithms

a. FCFS
b. SJF
c. Pre emptive Priority
d. Round Robin (Time Slice = 4 ms)

b. What is a Monitor? Describe the solution to Dining Philosophers problem using monitor 4 Marks

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END TERM FINAL EXAMINATION

Odd Semester: 2018-19 | **Date**: 26 December 2018

Course Code: CSE 210 | **Time**: 2 Hours

Course Name: Operating System | **Max Marks**: 80

Programme & Sem: CSE & V Sem | **Weightage**: 40%

Instructions:

(i) ***Use diagrams where ever applicable***

(ii)

Part A

Answer **all** the Questions. **Each** question carries **five** marks. (4Qx5M=20)

1. a) What is Deadlock? (1)
   b) What are safe and unsafe states? (1)
   c) Not all unsafe states are deadlocked. Defend (3)

2. How are user processes protected from each other and how is a user prevented from accessing the code or data structures of the operating system? Explain with a diagram. (3+2)

3. a) What is Address Binding?
   b) What are the various times at which Address Binding can happen? Explain. (1+1+3)

4. Explain the concept of Dynamic Linking and Shared Libraries and their benefits. (2.5+2.5)

Part B

Answer **all** the Questions. **Each** question carries **ten** marks. (4Qx10M=40)

5. a) What is Memory Fragmentation? Explain the causes for the different types of fragmentation and how they are overcome. (5)
   b) Thrashing is a severe performance problem- Explain (5)

6. a) Consider the following reference string for memory reference
   7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
   Illustrate the LRU Page replacement algorithm to calculate the number of page faults. (5)
   b) Briefly explain the process of Swapping with a diagram. (5)

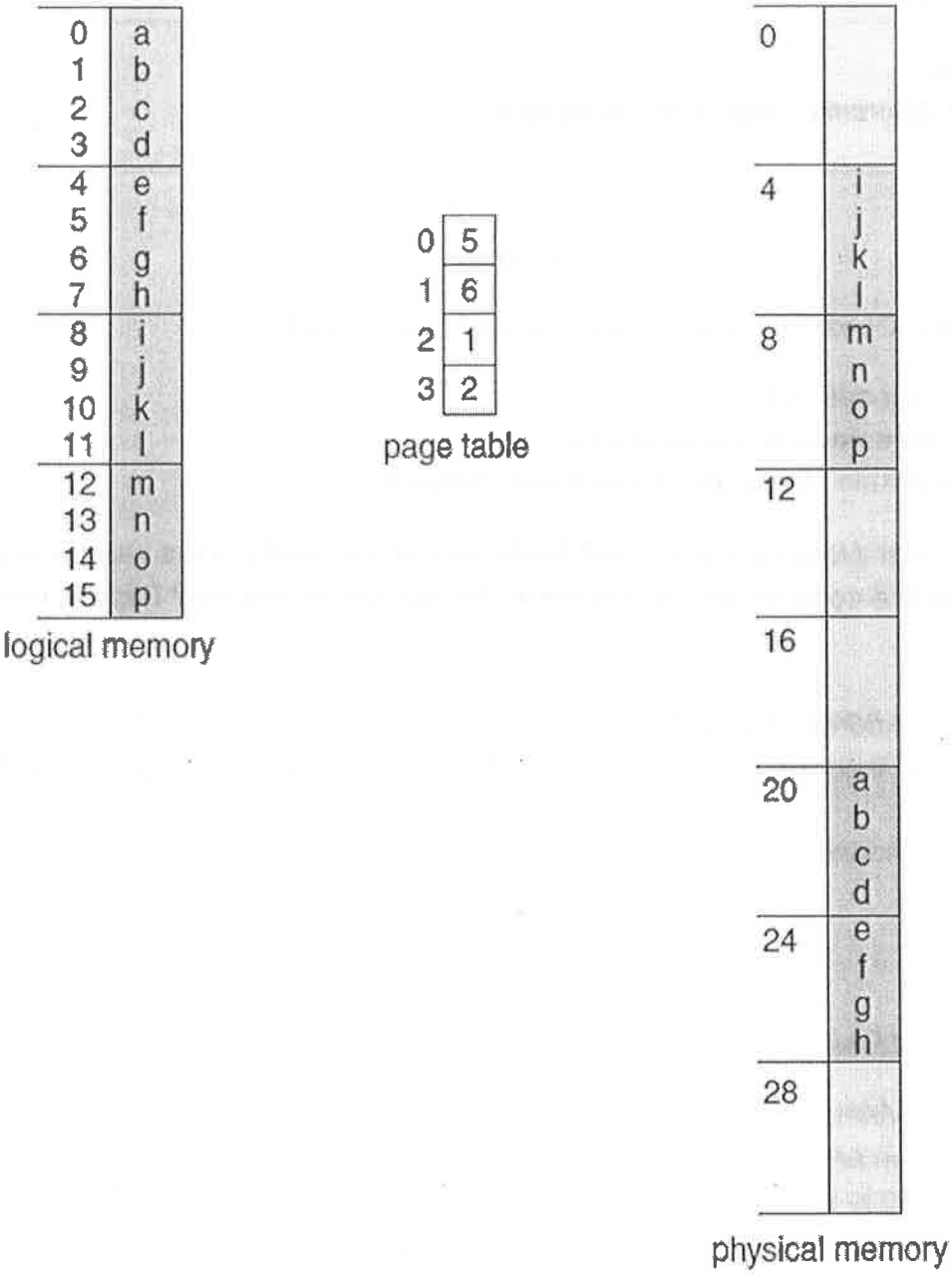
7. What is Virtual Memory? How is Virtual Memory implemented? Explain the implementation in detail with a diagram. (1+1+4+4)

8. a) Give the Banker's safety algorithm for deadlock avoidance. (5)
   b) Give the advantages of Virtual Memory (5)

Part C

Answer **all** the Questions. **Each** question carries **ten** marks. (2Qx10M=20)

9. Given the following example for paging where the logical address space is 16 and the physical address space is 32 and page size = 4 bytes. Calculate the physical address of the bytes m, n, o and p and k.



10. Consider the following snapshot of a system

	Allocation				Max			
	A	B	C	D	A	B	C	D
P0	3	0	1	4	5	1	1	7
P1	2	2	1	0	3	2	1	1
P2	3	1	2	1	3	3	2	1
P3	0	5	1	0	4	6	1	2
P4	4	2	1	2	6	3	2	5

Using the Banker's algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the processes may complete. Otherwise, why the state is unsafe.

a) Available = (0, 3, 0, 1)
b) Available = (1, 0, 0, 2)