

Seat No. : _____

DD-101

December-2018

B.C.A., Sem.-III

**CC-204 : Fundamentals of Operating System
(Old Course)**

Time : 2:30 Hours]

[Max. Marks : 70

1. (A) Answer the following :

- (1) Differentiate between the roles of an OS as a memory manager and a processor manager ? 7
- (2) What are Semaphores ? State the operations that can be performed on a semaphore. 7

OR

- (1) What are process states and transitions ? Explain the following transitions : 7
 - (i) READY → RUNNING → READY
 - (ii) RUNNING → WAIT → READY
- (2) Given the following information : 7

Process	CPU Cycle (Burst Time)	Arrival Time
P1	14	0
P2	7	1
P3	9	3
P4	2	5

Draw the time line and calculate the average turnaround time and average waiting time using :

- (i) First Come First Serve (FCFS)
- (ii) Round Robin Algorithm (Time Quantum=5msec)

(B) Answer the following : (any **four**) 4

- (1) _____ Jobs have small I/O cycles and long CPU cycles.
- (2) The process of increasing the priority of the process so as to get them executed is called _____.
- (3) When a job never gets the CPU it goes into a situation of _____.
- (4) The time required by the OS to switch from one job to another is called _____ time.
- (5) Round Robin is an example of a _____ scheduling policy.
- (6) The number of jobs getting executed in a given amount of time is called the _____.

2. (A) Answer the following :

- (1) Consider that the disk where tracks are numbered from 0 to 49. It takes 1 ms to travel from one track to another. Assume that currently the read/write head is positioned at track 12.

Given the following track requests :

7, 45, 28, 39, 18, 25, 2

Calculate average seek time (average number of tracks traveled) using FCFS and SSTF. 7

- (2) Explain using example the difference between Deadlock and starvation. 7

OR

- (1) Giving an example explain the situation of a deadlock. What are the conditions of deadlock ? 7
- (2) What do you understand by Safe and Unsafe states ? Give example to explain your answer. 7

(B) Answer the following : (any **four**) 4

- (1) A traffic jam is a representation of a situation of a _____.
- (2) In printers mutual exclusion can be removed by the concept of _____.
- (3) _____ devices are allocated to several processes.
- (4) _____ is an example of a dedicated device.
- (5) The full form of RAID is _____.
- (6) The concept of _____ is used to minimize the speed mismatch between high speed CPU and slow speed I/O devices.

3. (A) Answer the following :

- (1) Explain the difference between fixed partition and dynamic partition. 7
- (2) What is a page map table ? Explain its content. 7

OR

- (1) What is demand paging ? Explain how demand paging justifies the existence of virtual memory ? 7
- (2) Explain the concept of segmented memory allocation ? 7

(B) Answer the following : (any **three**) 3

- (1) Transfer of pages between the main memory and secondary memory is called ____.
- (2) The part of the operating system which handles the page fault is called the ____.
- (3) Excessive amount of swapping between main memory and secondary memory is called ____.
- (4) A failure to find a page in the main memory is called a ____.
- (5) In paged memory allocation the program is divided into ____.

4. (A) Describe the following :

- (1) Explain and differentiate non-contiguous and indexed storage allocation of files. 7
- (2) What is data compression ? Explain three different methods of data compression. 7

OR

- (1) Differentiate between default passwords and backdoor passwords. 7
- (2) What is the requirement of an access control list ? How is it different from a capability list ? 7

(B) Answer the following : (any **three**)

3

- (1) In _____ all records are of same size.
 - (2) In _____ records trailing blank spaces are truncated.
 - (3) A _____ protects a single file from unauthorized access.
 - (4) What is spoofing ?
 - (5) What is encryption ?
- _____

Seat No. : _____

DD-101

December-2018

B.C.A., Sem.-III

**CC-204 : Fundamentals of Operating System
(New Course)**

Time : 2:30 Hours]

[Max. Marks : 70

1. (A) Answer the following :

- (1) What is an operating system ? Which are the various types of operating system ? Explain each with example. 7
- (2) Differentiate between fixed partition and dynamic partition. 7

OR

- (1) Explain the difference between the roles of an OS as a Process Manager and a Processor Manager. 7
- (2) Differentiate between paged memory allocation and demand paging 7

(B) Answer the following : (any **four**) 4

- (1) Define page fault.
- (2) State the contents of Page Map table in paged memory allocation.
- (3) Define internal fragmentation
- (4) What is thrashing ?
- (5) All pages are of the same size whereas _____ are of different sizes.
- (6) The process of transfer of pages between the main memory and secondary memory is called _____.

2. (A) Answer the following :

(1) Which are the four different states a process can be in ? Discuss the six different transitions between these states. 7

(2) Using an example explain Burst Time, Waiting Time and Turnaround Time. Also state relationship between them. 7

OR

(1) Given the following information : 7

Process	CPU Cycle (Burst Time)	Arrival Time
P1	9	0
P2	6	1
P3	4	2
P4	8	4

Draw the time line and calculate the average turnaround time and average waiting time using:

(i) Shortest Job Next (SJN)

(ii) Round Robin (Time Quantum : 5msec)

(2) What do you understand by preemptive and non-preemptive scheduling policy of a process ? Give two examples of each. 7

(B) Answer the following : (any **four**) 4

(1) Define throughput.

(2) What is a process ?

(3) What is the role of a Job scheduler ?

(4) Give the full form of PCB.

(5) _____ jobs have long CPU cycle and small I/O cycle.

(6) The time required by the OS to switch from one job to another is called _____ time.

3. (A) Answer the following :

- (1) What are deadlocks ? Using an example explain how the conditions of 'mutual exclusion' and 'no preemption' lead to a situation of deadlocks. 7
- (2) What are semaphores ? What are the operations that can be performed on a semaphore ? Also, explain how using semaphores process synchronization can be achieved. 7

OR

- (1) Using an example explain what are safe and unsafe states to deal with deadlocks. 7
- (2) Explain the test and set lock method to achieve process synchronization. What is its drawback and how can it be overcome. 7

(B) Answer the following : (any **three**) 3

- (1) Define starvation.
- (2) Process P1 holds resource R1 and requests for R3. Draw a directed graph.
- (3) Define parallel processing.
- (4) _____ is the condition of deadlock when a resource holds a resource and requests for another resource.
- (5) Lack of process synchronization leads to _____ or _____.

4. (A) Answer the following :

- (1) Consider that the disk where tracks are numbered from 0 to 49. It takes 1 ms to travel from one track to another. Assume that currently the read/write head is positioned at track 14. 7

Given the following track requests :

5, 45, 28, 33, 18, 25, 12

Calculate average seek time (average number of tracks traveled) using SSTF and LOOK.

- (2) Explain and differentiate non-contiguous and indexed storage allocation of files. 7

OR

- (1) What are virtual devices ? Explain how the concept of spooling makes a printer work as a virtual device. 7
- (2) What is data compression ? Explain the three different methods of data compression. 7

(B) Answer the following : (any **three**)

3

- (1) CSW stands for _____.
- (2) _____ are devices which are assigned to only one job at a time.
- (3) _____ are used to minimize speed mismatch between high speed CPU and slow speed I/O devices.
- (4) Record format of two types : _____ and _____.
- (5) Give full form of DMA.
