2016

(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA–303

(Operating Systems)

(PART : A—OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(*Marks* : 15)

I. Tick (✓) the correct answer in the brackets provided : 1×10=10

1. What is operating system?

   (a) Collection of programs that manage hardware resources ( )

   (b) System service provider to the application programs ( )

   (c) Link to interface the hardware and application programs ( )

   (d) All of the above ( )

2. Which one of the following is not a real-time operating system?

   (a) VxWorks ( )

   (b) Windows CE ( )

   (c) RTLinux ( )

   (d) Palm OS ( )

3. The scheduling in which CPU is allocated to the process with least CPU-burst time is called

   (a) priority scheduling ( )

   (b) shortest job first scheduling ( )

   (c) round-robin scheduling ( )

   (d) multilevel queue scheduling ( )

4. Program 'preemption' is

   (a) forced deallocation of the CPU from a program which is executing on the CPU ( )

   (b) release of CPU by the program after completing its task ( )

   (c) forced allotment of CPU by a program to itself ( )

   (d) a program terminating itself due to detection of an error ( )

5. A set of techniques that allows to execute a program which is not entirely in memory is called

   (a) demand paging ( )

   (b) virtual memory ( )

   (c) auxiliary memory ( )

   (d) secondary memory ( )

6. The memory allocation scheme subject to 'external' fragmentation is

   (a) segmentation ( )

   (b) swapping ( )

   (c) demand paging ( )

   (d) multiple fixed contiguous partitions ( )

7. File system fragmentation occurs when

   (a) unused space or single file is not contiguous ( )

   (b) used space is not contiguous ( )

   (c) unused space is noncontiguous ( )

   (d) multiple files are noncontiguous ( )

8. File type can be represented by

   (a) file name ( )

   (b) file extension ( )

   (c) file identifier ( )

   (d) All of the above ( )

9. An operating system contains three user processes each requiring 2 units of resource. The minimum number of units of R such that no deadlocks will ever arise is

   (a) 4 ( )

   (b) 3 ( )

   (c) 5 ( )

   (d) 6 ( )

10. Which of the following approaches requires knowledge of the system state?

    (a) Deadlock detection ( )

    (b) Deadlock prevention ( )

    (c) Deadlock avoidance ( )

    (d) All of the above ( )

II. Indicate *True (T)* or *False (F)* by a Tick (✓) mark : $1 \times 5 = 5$

1. Connection failure in the network error will not be handled by the operating system.

(T / F)

2. Round-robin scheduling policy is most suitable for a time-shared operating system.

(T / F)

3. Page stealing is taking page frames from other working sets.

(T / F)

4. In the single-level directory, all files are contained in the same directory.

(T / F)

5. Before proceeding with its execution, each process must acquire all the resources it needs. This is called no preemption.

(T / F)

SECTION—II

(*Marks* : 10)

III. Answer the following questions : 2×5=10

1. What is single user of operating system?

2. Differentiate between scheduler and dispatcher.

3. What is paging?

4. What are file attributes?

5. What is semaphore?

★★★

- 2016

(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA–303

(Operating Systems)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 50)

The figures in the margin indicate full marks for the questions

1. *(a)* What are the main functions of operating system? 4

(b) Explain the concepts of parallel system and multiprocessor. 6

Or

(c) What is operating system? What are the operating system services provide functions to the users? 10

2. *(a)* Differentiate between short-term, long-term and medium schedulers. 4

(b) Explain the three multithreading models. 6

Or

(c) Explain any four scheduling criteria. 4

(b) The following processes arrive for execution at times indicated :

Process	*Arrival*	*Burst Time*
P1	0	1·5
P2	1·5	3
P3	3	1
P4	3	7·5

Draw a Grantt chart and calculate average waiting time for—

(i) FCFS scheduling;

(ii) preemptive SJF (shortest remaining time first) scheduling. 6

3. *(a)* Explain segmented memory management. 6

(b) What is the difference of logical and physical address spaces? 4

Or

(a) What is virtual memory? How can it be implemented? 7

(b) What is the need of place replacement? 3

(Continued)

4. *(a)* Describe sequential and direct access method for files. 10

Or

(b) Explain three major methods of disk space allocation. 10

5. *(a)* Describe the prevention methods of deadlock. 10

Or

(b) What is critical section problem? Write its general structure. Explain the requirements that must be satisfied by a solution to the critical section problem. 10

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