2017

(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)* Define kernel. Explain the primary goals of operating system. 2+4=6

(b) Explain briefly the basic components of computer system. 4

Or

(c) Explain the concepts of time-sharing system and distributed system. 6

(d) Explain any four services provided by an operating system. 4

2. *(a)* What is context switch? Explain the three types of scheduler. 2+4=6

(b) Explain the contents of a process control block with diagram. 4

Or

(c) Differentiate between user threads and kernel threads. Explain the many-to-many multithreading model. 4

(d) The following processes arrive for execution at time 0, with the length of CPU burst time given in milliseconds :

Process	*Burst time*
P1	8
P2	5
P3	3
P4	9

Draw a Gantt chart and compare the average waiting time for FCFS, SJF (non-preemptive) and RR (given : quantum time is 5 milliseconds) schedulings. 6

3. *(a)* Explain swapping with a suitable diagram. 4

(b) Differentiate between logical and physical address spaces. Explain the concepts of virtual memory. 2+4=6

Or

(c) Explain the basic paging method for memory management with example. 4

(d) Describe the following allocation algorithms : 2×3=6

(i) First fit

(ii) Best fit

(iii) Worst fit

4. *(a)* Explain the concepts of file attributes, file operations and file types. 6

(b) Explain briefly the different file access methods. 4

Or

(c) Write a short note on directory structure. 5

(d) Explain briefly the different file allocation methods. 5

5. *(a)* Explain the different methods of deadlock recovery. 5

(b) What is semaphore? Explain the implementation of counting semaphore in terms of binary semaphore. 5

Or

(c) Explain the methods for handling deadlocks. 5

(d) Differentiate between program threads and system threads. 5

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Subject Code : III/BCA/303

Booklet No. A

Date Stamp .....

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To be filled in by the Candidate

DEGREE 3rd Semester
(Arts / Science / Commerce / .....) Exam., **2017**

Subject .....
Paper .....

INSTRUCTIONS TO CANDIDATES

1. **The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.**
2. **This paper should be ANSWERED FIRST and submitted within 1 (one) Hour of the commencement of the Examination.**
3. **While answering the questions of this booklet, any cutting, erasing, over-writing or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.**

To be filled in by the Candidate

DEGREE 3rd Semester
(Arts / Science / Commerce / .....) Exam., **2017**

Roll No. .....
Regn. No. .....

Subject .....
Paper .....

Descriptive Type
Booklet No. B .....

Signature of Scrutiniser(s)

Signature of Examiner(s)

Signature of Invigilator(s)

/265

2017

(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. The systems that have more than one processor in close communication, sharing the computer bus, the clock and sometimes memory and peripheral devices are

   (a) parallel systems ( )

   (b) multiprocessor systems ( )

   (c) tightly couple systems ( )

   (d) All of the above ( )

2. The interval from the time of submission of a process to the time of completion is called

   (a) turnaround time ( )

   (b) waiting time ( )

   (c) response time ( )

   (d) throughput ( )

3. A memory area that stores data while they are transferred between two devices or between a device and an application is called

   (a) virtual memory ( )

   (b) swapping ( )

   (c) buffer ( )

   (d) cache memory ( )

4. If several jobs are ready to run at the same time, the system must choose among them. Making this decision is

   (a) job scheduling ( )

   (b) CPU scheduling ( )

   (c) batch scheduling ( )

   (d) process scheduling ( )

5. The performance of the RR scheduling algorithm depends heavily on

   (a) arriving time of the process ( )

   (b) size of the process ( )

   (c) size of the time quantum ( )

   (d) All of the above ( )

6. The run-time mapping from virtual address to physical address is done by

   (a) operating system ( )

   (b) hardware device ( )

   (c) dynamic loading ( )

   (d) dynamic linking ( )

7. Logical memory is broken into blocks of the same size, is called

   (a) page ( )

   (b) partition ( )

   (c) fragmentation ( )

   (d) frame ( )

8. A _____ is a set of methods for ensuring that at least one of the necessary conditions cannot hold.

   (a) deadlock prevention ( )

   (b) deadlock avoidance ( )

   (c) deadlock detection ( )

   (d) deadlock recovery ( )

9. A directory structure scheme which allows directories to have shared subdirectories and files is

   (a) single-level directory ( )

   (b) two-level directory ( )

   (c) tree-structured directory ( )

   (d) acyclic-graph directory ( )

10. The _____ is not applicable to a resource-allocation system with multiple instances of each resource type.

    (a) resource-allocation graph algorithm ( )

    (b) Banker's algorithm ( )

    (c) safety algorithm ( )

    (d) resource-request algorithm ( )

II. Indicate whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5=5

1. Multiprogramming increases CPU utilization by organizing jobs so that the CPU always has one to execute.

(T / F)

2. A swapper manipulates entire processes, whereas a pager is concerned with the individual pages of a process.

(T / F)

3. All the multiprocessor systems are multicore systems.

(T / F)

4. The priority scheduling algorithm can be preemptive or nonpreemptive.

(T / F)

5. An object file is a series of code sections that the loader can bring into memory and execute.

(T / F)

SECTION—II

(*Marks* : 10)

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

1. Differentiate between process and thread.

2. What is blade server?

3. What is demand paging?

4. What is graceful degradation?

5. What are the two advantages of encrypting data stored in the computer system?

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