III/BCA/302

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(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA–302

(Fundamentals of Operating System)

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 do you understand by system calls? Explain any four services provided by an operating system with example.

 2+8=10

Or

 (b) Define the essential properties of the following types of operating system :

 2×5=10

 (i) Multiprocessor systems
 (ii) Time sharing/Multitasking
 (iii) Real-time system
 (iv) Distributed system
 (v) Clustered system

2. (a) Explain message passing system in brief. 4

(b) Describe the differences among short-term scheduling, medium-term scheduling and long-term scheduling. 6

Or

(c) Explain any four types of scheduling algorithm with a neat diagram. 10

3. (a) Explain swapping with a neat diagram. 4

(b) Differentiate between paging and segmentation. 6

Or

(c) Explain the concept of demand paging with a neat diagram. Write a short note on process creation. 5+5=10

4. (a) Explain different types of access method. Write a short note on acyclic-graph directories. 6+4=10

Or

(b) What is allocation method? Explain the following with a neat diagram : 10

(i) Contiguous allocation

(ii) Linked allocation

(iii) Indexed allocation

5. *(a)* Explain various methods of deadlock avoidance.   10

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Or

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(b) Write short notes on authentication and encryption. Explain different methods of user authentication.   5+5=10

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(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA–302

(Fundamentals of Operating System)

(PART : A—OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(*Marks* : 15)

1. Select the correct answer by putting a Tick (✓) mark in the brackets provided : 1×10=10

   (a) A —— manages the execution of user programs to prevent errors and improper use of the computer.

   (i) user interface ( )

   (ii) control program ( )

   (iii) clustered system ( )

   (iv) physical memory ( )

(b) Creating a number of threads at process startup and place them into a pool, where they sit and wait for work is known as

(i) P threads ( )

(ii) Solaris 2 threads ( )

(iii) thread pool ( )

(iv) buffering ( )

(c) Logical memory broken into blocks of the same size is called

(i) frame ( )

(ii) block ( )

(iii) segment ( )

(iv) page ( )

(d) —— is the separation of user logical memory from physical memory.

(i) Demand paging ( )

(ii) Demand segmentation ( )

(iii) Virtual memory ( )

(iv) Virtual-address space ( )

(e) —— is a process that uses the spawn mechanism to clobber system performance.

    (i)   WORM   (   )

    (ii)   Viruse   (   )

    (iii) Trapdoor   (   )

    (iv) All of the above   (   )

(f) A —— system functions correctly only if it returns the correct result within its time constraints.

    (i)   multiprogramming   (   )

    (ii)   parallel   (   )

    (iii) distributed   (   )

    (iv) real-time   (   )

(g) A/An —— bound generates input-output requests infrequently, using more of its time doing computation.

    (i)   CPU   (   )

    (ii)   input-output   (   )

    (iii) input   (   )

    (iv) output   (   )

(h) Find the odd one out of the following :

    (i) Mutual exclusion   (   )

    (ii) Hold and release   (   )

    (iii) No preemption   (   )

    (iv) Circular wait   (   )

(i) —— is used to constrain the potential senders and receivers of a message.

    (i) Cryptography   (   )

    (ii) Authentication   (   )

    (iii) Encryption   (   )

    (iv) Decryption   (   )

(j) A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place is

    (i) critical section problem   (   )

    (ii) bounded-buffer problem   (   )

    (iii) readers-writers problem   (   )

    (iv) rare condition   (   )

(**5**)

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

(a) In symmetric clustering, one machine is in hot standby mode while the other is running the applications.

(*T* / *F*)

(b) The bounded-buffer producer-consumer problem places no practical limit on the size of the buffer.

(*T* / *F*)

(c) The fork() system call creates a child process as a duplicate of its parent.

(*T* / *F*)

(d) One-time passwords change the sent data each time to avoid replay attacks.

(*T* / *F*)

(e) A state is safe if the system can allocate resources to each process (up to its maximum) in some order and still avoid a deadlock.

(*T* / *F*)

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(T / F)

SECTION—II

(*Marks* : 10)

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

(a) Write a short note on peer-to-peer systems.

(b) Differentiate between process and thread.

(8)

(c) Explain semaphores.

(d) What is trapdoor?

(e) Differentiate between logical address space and physical address space.

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