

Total No. of printed pages = 3

MCA 202105

Roll No. of candidate

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22/11/2021

M.C.A. 1st Semester End-Term Examination

OPERATING SYSTEMS

(New Regulation w.e.f. 2020-2021)

(New Syllabus w.e.f. 2020-21)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Choice the appropriate answer :

(10 × 1 = 10)

(i) A Process Control Block (PCB) does not contain which of the following?

- (a) Code (b) Stack
(c) Bootstrap program (d) Data

(ii) What is an operating system?

- (a) Collection of programs that manages hardware resources
(b) System service provider to the application programs
(c) Interface between the hardware and application programs
(d) All of the mentioned

(iii) To access the services of operating system, the interface is provided by the _____.

- (a) System calls (b) API
(c) Library (d) Assembly instructions

(iv) In Operating Systems, Which of the following is/are CPU scheduling algorithms?

- (a) Round Robin (b) Shortest Job First
(c) Priority (d) All of the mentioned

[Turn over

- (v) What is the ready state of a process?
- (a) when process is scheduled to run after some execution
 - (b) when process is unable to run until some task has been completed
 - (c) when process is using the CPU
 - (d) none of the mentioned
- (vi) What is interprocess communication?
- (a) communication within the process
 - (b) communication between two process
 - (c) communication between two threads of same process
 - (d) none of the mentioned
- (vii) A set of processes is deadlock if _____.
- (a) each process is blocked and will remain so forever
 - (b) each process is terminated
 - (c) all processes are trying to kill each other
 - (d) none of the mentioned
- (viii) If a process fails, most operating system write the error information to a _____.
- (a) log file
 - (b) another running process
 - (c) new file
 - (d) none of the mentioned
- (ix) For a deadlock to arise, which of the following condition must hold simultaneously?
- (a) Mutual exclusion
 - (b) No preemption
 - (c) Hold and wait
 - (d) All of the mentioned
- (x) Deadlock prevention is a set of methods _____.
- (a) to ensure that at least one of the necessary conditions cannot hold
 - (b) to ensure that all of the necessary conditions do not hold
 - (c) to decide if the requested resources for a process have to be given or not
 - (d) to recover from a deadlock

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2. (a) Explain any five types of operating system. (5)
 (b) Explain the basic functions of operating system. (5)
 (c) State the difference between multitasking and multiprogramming operating system. (5)
3. (a) What is PCB? What are the difference types of information stored in PCB? (5)
 (b) Explain the process state transition diagram briefly with diagram. (5)
 (c) What is the prevention in handling deadlock? (5)
4. (a) Explain the virtual memory concept of segmentation. (5)
 (b) Differentiate between contiguous and non contiguous memory allocation. (5)
 (c) Explain swapping, paging and segmentation in memory allocation. (5)
5. (a) Explain I-node structure used by UNIX or FAT structure used by DOS for file storage. (5)
 (b) How disk space management is very critical in file system design? (5)
 (c) Briefly explain different layers of I/O software. (5)
6. (a) Write a note on demand paging and page replacement policies. (5)
 (b) Why RTOS is required in embedded system development? What are the specific services performed by RTOS in embedded systems? (10)
7. Write (any three) short note on : (3 × 5 = 15)
- Banker's Algorithm for single/multiple resources
 - Semaphore
 - CPU and IO bound
 - Block diagram of Embedded system
 - System On Chip (SOC)
 - Distributed operating system.

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