

Unit-IV

8. Explain the following :

- (a) Shell and its types
  - (b) Race conditions and their avoidance
  - (c) Mutual Exclusion and its relevance
- \$5.6

9. (a) Outline the purpose and syntax of any two UNIX commands belonging to the following categories of commands :

- (i) Information commands
- (ii) Process management
- (iii) System administration

(b) What is meant by disk scheduling ? State the desirable characteristics of disk scheduling policies and explain briefly the various seek optimization scheduling policies.

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Roll No : .....

Total No. of Questions : 9 ] Total No. of Pages : 4

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MCA (Regular) 3rd Semester  
Examination, February-2022  
(General CBCS scheme w.e.f. Dec-2017-18)  
Paper-17MCA302

**OPERATING SYSTEMS**

Time : Three Hours ]

Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Attempt five questions in all, selecting one question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

- 1. (a) What do you mean by Interrupt Handler ?
- (b) What is a Device Controller ?
- (c) What are Process States ?
- (d) What is Real-time Scheduling ?

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- (c) What is Critical Section ?
- (d) What are Bernstein's Conditions ?
- (e) What is fragmentation ? How can it be overcome ? Explain.
- (f) What is the directory structure of UNIX operating system ? 2×8=16

**Unit-I**

2. (a) What do you mean by an operating system ? What are the major functions of an operating system ? Explain.
  - (b) What is CPU scheduling ? What are various CPU scheduling algorithms ? Illustrate their working. 8,8
  3. Explain the following :
    - (a) Virtual Machines
    - (b) Distributed File system
    - (c) Operating System Services 5,6,5
- Unit-II**
4. (a) What is PMT ? How is physical memory address determined from effective address ?

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- (b) What is segmentation ? Discuss its advantages and disadvantages.
- (c) What is a page ? How is a page size decided ? Justify your answer. 5,5,6
- 5. Explain the following :
  - (a) Thrashing
  - (b) Page Replacement Algorithms 6,10

**Unit-III**

6. (a) What do you mean by 'Semaphore' ? What are the disadvantages of semaphore ? Implement the Producer-Consumer problem using Semaphores.
- (b) Explain the function of Access Control Verification (ACV) module of file-system. 8,8
7. (a) What is a file-system ? What are the main responsibilities of a file-system ? Where is file-system located in layered organization of operating system ?
- (b) What is Dining Philosopher's problem ? Also provide the correct solution for the same. State the relevance of the same in operating systems. 8,8

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