

MCA (Revised)

Term-End Examination

December, 2018

01533

MCS-041 : OPERATING SYSTEMS

Time : 3 hours

Maximum Marks : 100

(Weightage : 75%)

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**Note :** Question no. 1 is compulsory. Attempt any three questions from the rest.

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1. (a) What is a deadlock ? Explain the necessary and sufficient conditions for deadlock occurrence. Also explain how deadlock can be prevented. 10
  
- (b) What is mutual exclusion ? Write and explain Dekker's solution for mutual exclusion. 10
  
- (c) Explain with a diagram, how paging supports the virtual memory. Also explain how a logical address is translated into a physical address in paging. 10

- (d) Write and explain Lamport's Bakery Algorithm with an example in a distributed OS. 10
2. (a) Differentiate between a process and a thread. Draw and explain the five states process model. 10
- (b) Give the components of UNIX system. Describe the role of kernel in UNIX. 10
3. (a) Explain FCFS, LRU, Optimal page replacement algorithms. Which algorithm suffers from Belady's anomaly ? Explain with an example. 10
- (b) Write short notes on the following : 2×5=10
- (i) Swapping
- (ii) Overlays
- Explain with suitable diagrams.
4. (a) Discuss various design issues involved in a distributed system. 10
- (b) With the help of a neat diagram, describe Crossbar and Hypercube multiprocessor interconnection architecture. 10

5. Write short notes on the following :

4×5=20

- (a) Virtual Memory System
  - (b) Take-Grant Security Model
  - (c) Paging in Memory Management
  - (d) Memory Management in Windows 2000
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