

**B.Tech Odd Semester (CBCS) Exam.,  
December—2016**

**INFORMATION TECHNOLOGY**

**( 5th Semester )**

Course No. : IT-501

**( Operating System )**

Full Marks : 75

Pass Marks : 30

Time : 3 hours

- Note :*
1. Answer **one** question from each Unit.
  2. Begin each answer in a new page.
  3. Answer parts of a question at a place.
  4. Assume reasonable data wherever required.
  5. The figures in the margin indicate full marks for the questions.

UNIT—I

1. (a) Explain briefly the functions of an operating system. 5
- (b) Write a short note on evolution of OS. 5

- (c) What is a thread? How is it different from a process? Explain different multithreading models. 1+1+3=5

2. (a) Write a short note on operating system structure. Also explain the same with a labelled diagram. 4+2=6

- (b) What is a process? Draw the structure of a PCB. Explain briefly the inter-process communication. 1+3+5=9

UNIT—II

3. (a) State briefly the difference amongst long-term scheduling, midterm scheduling and short-term scheduling. Also briefly explain the concept of multilevel feedback queuing. 3+6=9

- (b) Give a solution of critical section problem for  $n$  processes using TestAndSet() hardware instruction with the help of example. 6

4. (a) What is a deadlock? Explain briefly the necessary condition for deadlock. 5

- (b) Write Banker's algorithm. Also explain in detail the data structure used in Banker's algorithm. 5+5=10

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UNIT—III

5. (a) A paging system is implemented using a TLB which has a hit ratio of 80% and it requires 20 nanoseconds to search the TLB. If 100 nanoseconds is required to search the main memory, calculate the effective access time for this system. What is the effective access time of the system if the hit ratio is changed from 80% to 98%? 4+2=6
- (b) What is fragmentation? Explain internal and external fragmentation. Which type of fragmentation do segmentations suffer from? Explain in detail. 3+3+3=9
6. (a) Explain the concept of demand paging. Also compare the performance of demand paging with that of other memory management policies. 9
- (b) Explain various page replacement algorithms. 6

UNIT—IV

7. (a) With a schematic diagram, explain the structure of a disk. 7
- (b) Explain the application I/O interface in detail. 8

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8. What is disk scheduling? Explain various disk scheduling algorithms in detail. Give labelled diagrams whenever necessary. 15

UNIT—V

9. Write a detailed note on protection and security in a computer system. 15
10. (a) Explain briefly the directory structure. Also explain the attributes of a file. 8
- (b) What are the different file allocation methods? Explain. 7

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