Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech(IT-N)/SEM-5/IT-503/2012-13
2012
OPERATING SYSTEM

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

             $10 \times 1 = 10$

    i) The main purposes of OS is

        a) to provide users an environment to execute programs

        b) to manage computer resources

        c) both (a) & (b)

        d) none of these.

    ii) A process is

        a) a program

        b) a file

        c) a program in excution

        d) a function of computer.

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iii) Which of the following is true about Multiprogramming ?

    a) Increase efficiency by overlapping CPU burst and I/O burst of different proceses

    b) Allow users to write multiple programs

    c) Allows multiple users to use the computer

    d) All of these.

iv) Preemptive SJF is known as

    a) Shorted I/O Burst First

    b) Shortest CPU Burst First

    c) Round Robin

    d) Shortest Remaining Time First.

v) Monolithic kernel is a characteristic of

    a) Windows NT   b) Linus

    c) DOS   d) All of these.

vi) Micro kerneel is characteristics of

    a) Windows NT   b) Linux

    c) DOS   d) All of these.

vii) Context switch is involved in

    a) Switching computer on

    b) Switching CPU from one process to another

    c) Switching a process on

    d) None of these.

viii) Which of the following is a Inter Process Communication (IPC) mechanism

    a) PIPE   b) Message Queue

    c) Shared Memory   d) All of these.

ix) A thread is

    a) a lightweight process

    b) colorless

    c) used for stitching

    d) none of these.

x) Which of the following is true about multithreading ?

    a) It is a programming technique

    b) It is provided by linker

    c) It is an obsolete idea now

    d) It increases responsiveness and efficiency of a program.

xi) Inter Process Communication (IPC) is used for

    a) Communication between computer and printer

    b) Communication between computer and keyboard

    c) Communication between two separate processes

    d) None of these.

xii) Dispatcher is responsible

    a)   Dispatching files

    b)   Giving control of CPU to a process selected by short time scheduler

    c)   Increosino the throughput of the system

    d)   None of these.

xiii) Critical section is segment of code, which
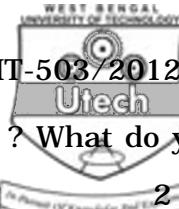
    a)   defines critical variables

    b)   defines critical functions

    c)   accesses shared resources

    d)   both (a) and (b).

xiv) A semaphore is

    a)   a file

    b)   a process synchronization tool

    c)   a memory management too

    d)   a disk management tool.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following.   3 × 5 = 15

2.   What is the difference between Time Sharing and Batch system ? What are the advantages of using Thread over Process ? What is System Call ?   2 + 2 + 1
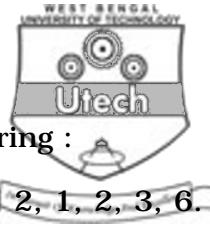
3. What is Message Passing and why it is used ? What do you mean by Direct and indirect communication ? 2 + 3

4. What is main features of Multiprocessor scheduling ? Briefly discuss Multiprocessor feedback queue scheduling ? 2 + 3

5. What are the criterions for a system to be Deadlock ? What is the main disadvantage of allocating memory contiguously ? Mention any two file access method ? 2 + 2 + 1

6. Write short notes on nay *two* the following : $2 \times 2\frac{1}{2}$

   a) Process Control Block

   b) Paging

   c) Thread

   d) Security and Protection in Operation System.

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. a) What is the difference between a thread and a process ?

   b) Describe a deadlock prevention mechanism.

   c) Prove that this mechanism actually to prevents deadlock. 4 + 6 + 5

8. a) Under what circumstances do page faults occur ?

   b) Describe the actions taken by the operating system when a page fault occurs.

c) Consider the following page reference string :

1, 2, 3, 4, 2, 1. 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms assuming four and six frames respectively ? All frames are initially empty : 4 + 5 + 6

● LRU replacement

● FIFO replacement

● Optimal replacement.

9. a) What is seek time and latency time ?
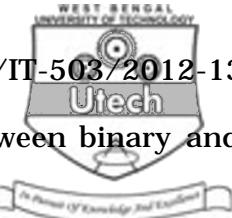
b) A disk has 200 track's (numbered 0 through 199). At a given time, it was servicing the request of reading data from track 120 and at the previous request, service was for track 90. The pending request (in order of their arrival) is for track numbers

30   70   115   130   110   80   20   25

How many times will the head change its direction for the disk scheduling policies SSTF (Shortest Seek Time First) one FCFS (First Come First Serve) ?

2 + 3 + 5 + 5

10. a) What is an *i*-node ? Describe different fields in an *i*-node.

b) Describe structure of FAT file system.

c) What is critical section problem ? What are the requirements those are to be met by a solution to the critical section problem ? 1 + 2 + 5 + 3 + 4

11. a) What is semaphore ? Differentiate between binary and counting semaphore.

b) What is monitor ? Give a solution of bounded buffer problem with monitor.

c) Describe Dining Philosopher problem.

12. Write shorte notes on any *three* of the following :   5 + 5 + 5

a) Segmentaion

b) Real time systems

c) Multi level paging

d) Dual mode operation.

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