VRK/KS/14/6647

Faculty of Engineering & Technology
Fourth Semester B.E. (Computer Science Engineering)
(C.B.S.) Examination
OPERATING SYSTEM
Paper–III

Time—Three Hours]   [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Assume suitable data wherever necessary.

(3) Illustrate your answers wherever necessary with the help of neat diagram.

1. (a) What is Operating System ? Explain Batch and Distributed Operating System.   7

    (b) Explain the various Hardware requirements for Modern Operating System.   6

OR

2. (a) List and explain various services provided by operating system.   7

    (b) What is system call ? Explain its categories.   6

3. (a) Define a file system. What are the different components of a file system ?   6

    (b) Explain the different access methods for file.   7

OR

4. (a) Explain contiguous allocation and index allocation method. 6

   (b) Suppose the head of moving head disk with 200 tracks is currently at track 60. If the queue of a request is kept in order as 65,170,35,120,10,140 what is the total read movement to satisfy the request for the scheme ?

   (i) FCFS

   (ii) CSCAN

   (iii) SSTF

   (iv) LOOK 7

5. (a) Draw the state transition diagram of a process and explain each state in brief. 7

   (b) What are the different kinds of schedules present in the system ? Bring out the relevance of each of them. 6

OR

6. (a) Define thread. Explain various multi threading models for thread. 6

   (b) Consider the following set of processes. 7

Process	Cpu Burst time	Arrival time
P_1	3	0
P_2	5	1
P_3	2	2
P_4	5	3
P_5	5	4

Calculate the average waiting time and Turnaround time for each algorithm.

   (i)   FCFS

   (ii) SJF

   (iii) RR (time slice =2)

7. (a) Explain the difference between internal and external fragmentation.   7

    (b) Explain the hardware implementation of paging in detail with neat sketch and example.   7

OR

8. (a) A page size is always a power of 2. Justify the statement.   3

    (b) Implementation of virtual memory is architecture dependent. Comment.   4

    (c) Consider the following page reference string

       1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5 for a memory with 3 frames. How many page faults would occur for following page replacement algorithm ?

       (i)   LRU replacement

       (ii) FIFO replacement

       (iii) Optimal replacement.   7

9. (a) What is mutual Exclusion ? How are semaphores used to solve the critical section problem ?   7

(b) What is semaphore ? What is the difference between a binary and counting semaphore ?   7

OR

10. (a) Describe the producer consumer bounded buffer problem. Give routines for producer and consumer process.   7

(b) What are P and V operations in process synchronization ? Explain.   7

11. (a) What are necessary conditions for occurrence of deadlock and how deadlock can be prevented ?

                        7

(b) Describe the resource allocation graph. Prove that if a graph contain a cycle still there is no deadlock.

                        6

OR

12. (a) Explain the access matrix in detail along with its implementation.   4

(b) Compare Capability list with Access list.   3

(c) Write short notes on (any **two**) :

(i) Cryptography

(ii) Security threat

(iii) Recovery from Dead Lock.   6