11. (a) State the critical section problem. Explain the basic requirements of a critical section problem solution.

(b) Describe how to implement thread & explain various types of thread in detail.

OR

(a) What is dining philosophers problem ? How is mutual exclusion provided in the problem.

(b) Explain dead lock avoidance. Define safe & unsafe states in a system.

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No. of Questions : 11 Total No. of Printed Pages : 10

JK-224

B.C.A. III[rd] Semester (New)/ATKT

Examination, 2016

Operating System

Paper - BCA-304

e : 3 Hours] [Maximum Marks : 85

: :- Attempt all questions.

SECTION - 'A'

Objective Type Questions 3×5=15

Choose the correct answer :

i) Multiprogramming increases _____ by organizing jobs ?

(a) Memory utilization (b) CPU utilization

(c) H/W utilization (d) Both a & b

(ii) The PCB contains information that makes the process _____ entity ?

(a) Dynamic

(b) Passive

(c) Active

(d) Static

(iii) The short-term scheduler carries out the :

(a) Selection process

(b) Termination

(c) Starter

(d) Execution

(iv) _____ can be described by resource allocation graph ?

(a) Interprocess communication

(b) Deadlocks

(c) Synchronization

(d) None

(v) The operating system is an example for _____ approach :

(a) Below layered

(b) Over layered

(c) None layered

(d) Layered

(vi) Main function of shared memory is :

(a) To use primary memory efficiently

(b) To do intra process communication

(c) To do inter process communication

(d) None of above

(vii) Disk scheduling includes deciding :

(a) Which should be accessed next

(b) Order in which disk access request must be serviced

(c) The physical location of the file

(d) The logical location of the file

(viii) Belady anamoly occurs in :

(a) Optimal replacement

(b) FIFO

(c) LRU

(d) None of above

(ix) Which scheudling policy is best suited for time sharing OS :

(a) Shortest Job first

(b) Round Robin

(c) First Come first serve

(d) Elevator

(x) Memory protection is normally done by :

(a) The processor & the associated H/W

(b) The operating system

(c) The compiler

(d) The user program

(xi) Four necessary conditions for deadlock are non pre-emption, circular wait, hold & wait and :

(a) Race condition

(b) Buffer overflow

(c) Mutual execlusion

(d) None of above

(xii) Poor response time are caused by :

(a) Busy processor (b) High I/O rate

(c) High Paging rates (d) Any of above

(xiii) Dijkstra algorithm deals with :

(a) Mutual exclusion

(b) Dead lock recovery

(c) Deadlock avoidance

(d) Cache memory

(xiv) Which of the following does not interrupt an running process :

(a) A device

(b) Timer

(c) Schedular process

(d) Power failure

(xv) The Banker's algorithm is used :

(a) To prevent deadlock in OS

(b) To detect deadlock in OS

(c) To Rectify a dead lock state

(d) None of these

SECTION - 'B'

Short Answer Type Questions **5×5=25**

2. What is an operating system ? Discuss the difficulties involved in writing an operating system for a real-time environment.

OR

What are the advantages of using the features of multitasking for a user working in :

(i) Single user environment

(ii) Multi user environment

Explain clearly giving suitable example

3. Draw & explain process state transition diagram.

OR

Explain multi level queue & event driven scheduling algorithms.

4. What do you mean by swapping ? How does it help in memory management.

OR

Consider variable partitioning. If the following jobs in order are to fit in memory 200K, 50K, 250K, 150K using :-

(i) First fit

(ii) Best fit

(iii) Worst fit

Sketch and explain

5. Discuss contiquous file allocation method.

OR

What problems arise in a cyclic graph directory system ? Describe the approaches used for over coming these problems.

6. How is interprocess communication achieved in operating system ?

OR

Explain how security violation can take place due to different ways of passing of the parameters.

SECTION - 'C'

Long Answer Type Questions **9×5=45**

7. Enumerate the operating system services and functions. Also discuss how these services are provided.

OR

Discuss about different types of operating system with regard to the following aspects :-

(i) Processor scheduling

(ii) Memory Management

(iii) I/O Management

(iv) File management

8. Explain the different among short term, median term and long term scheduling with the help of process state transition diagram.

OR

For the following jobs calculate the turn around time, waiting time using Round Robin (time quantum = 1) scheudling algorithm :

Jobs	CPU Burst Time	Arrival time
1	10	0
2	2	3
3	1	4
4	4	5

9. Describe various page replacement algorithm along with their merits & demerits.

OR

Discuss the strength & weaknesses of the following memory management schemes :-

(i) Fixed partitioning scheme & dynamic partitioning scheme.

(ii) Paging & segmentaiton

10. Describe the selection criteria of a disk scheduling algorithm.

OR

Suppose the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 & has just finished a request at track 125. If the queue of request is :

86, 147, 91, 177, 94, 150, 102, 175, 130

what is the total head movement using.

SSTF & SCAN