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(20623)

BCA.-IV Sem.

Printed Pages : 7

Roll No. ....

18017

B.C.A. Examination, June-2023
OPERATING SYSTEM
(BCA-402)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from *all* sections as per instructions.

Section—A

(Very Short answer Type Questions)

Note : Attempt all *five* questions. Each question carries 3 marks.   5×3=15

1. What is an Operating System ? State different types of OS ?

2. Explain the different process states with the help of state diagram.

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3. What are the conditions under which a deadlock situation may arise ?

4. What are the various Disk-Scheduling Algorithms ?

5. Write briefly about file attributes, operations, types and structure.

Section—B

(Short Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 7.5 marks.   2×7.5=15

6. Discuss in detail about file allocation methods. What are the possible structures for directory ? Discuss them in detail.

7. What is the important feature of the critical section? State the dining philosopher's problem and show how to allocate the several resources among several processes in a deadlock and starvation free manner.

8. Explain with the help of examples FIFO and LRU, optical page replacement algorithms with example reference string. Mention the merits and demerits of each of the above algorithms.

Section–C

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 15 marks. 3×15=4:

9. Consider the following five processes, with the length of the CPU burst time given in millisecond

Process	Burst time
P1	10
P2	29
P3	3
P4	7
P5	12

Consider the First come First serve (FCFS), Non-Preemptive Shortest Job First (SJF), Round Robin (RR) (quantum=10ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time ? Discuss.

10. (i) Construct a Resource Allocation Graph for the following scenario. At time 't' Process P1 request for a resource X, process P2 requests

for a resource Y. Both the resources are Available. and they are allocated to the requesting process. At time t_1 where $t_1 > t_2$ both the processes are still holding the resources, however process P1 request for Y which is held by P2, process P2 request for X held by P1. Will there be a deadlock ? If there is a deadlock discuss the four necessary conditions for deadlock. else justify there is no deadlock.

(ii) With relevant example show that the implementation of a semaphore with a waiting queue may result in deadlock.

11. Suppose that the disk drive has 5000 cylinders number 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at 125. the queue of the pending request in FIFO order is : 86, 1470, 913, 1174, 948, 1509, 1022, 1750, 130 starting from the current head position, what is the total distance (cylinders) that the disk arm moves to satisfy all the pending requests for each of the disk scheduling algorithms.

(i) SSTF

(ii) SCAN

(iii) LOOK

(iv) C-LOOK

12. What do you understand by fragmentation ? Explain Dynamic Storage-Allocation Problem and segmentation in detail.

13. Explain File System Structure. What are File System Organization and File System Mounting ? Discuss the various file Allocation Methods in detail.

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