2008-09

Time : 3 hours

Full Marks : 80

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

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A
(Compulsory)

Answer all questions : 2×10 = 20

1. Select the correct option from the following :

   (a) The first fit, best-fit and the worst-fit can be user for :

      (i) Contiguous allocation of memory
      (ii) Linked allocation of memory
      (iii) Indexed allocation of memory
      (iv) All of these

EL – 10/1 (Turn over)
(b) Consider a set of 3 processes whose CPU time needed are given:

<table>
<thead>
<tr>
<th>Process</th>
<th>CPU time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>10</td>
</tr>
<tr>
<td>P2</td>
<td>5</td>
</tr>
<tr>
<td>P3</td>
<td>3</td>
</tr>
</tbody>
</table>

If the CPU scheduling policy is FCFS, the average waiting time will be:

(i) 5
(ii) 18
(iii) 8
(iv) 15

(c) In which one of the following page replacement policies, Belady’s anomaly may occur?

(i) FIFO
(ii) Optimal
(iii) LRU
(iv) MRU

EL-10/1 (2) Contd.
(d) The simplest directory structure is:
   (i) Single level directory
   (ii) Two level directory
   (iii) Tree structure directory
   (iv) None of these

(e) A file is:
   (i) Logical storage unit
   (ii) An abstract data type
   (iii) File is usually non-volatile
   (iv) All of the above

(f) Thrashing:
   (i) Reduces page I/O
   (ii) Decreases the degree of multiprogramming
   (iii) Implies excessive page I/O
   (iv) Improves the system performance

(g) A process is another name for:
   (i) A job
   (ii) A task
   (iii) Paging
   (iv) The OS dispatcher
(h) With RR CPU scheduling in a time shared system:

(i) Using very large time slices, it perform likes FCFS algorithm
(ii) Using very extremely small time slices, improves performance
(iii) Using large time slices, it perform likes LIFO algorithm
(iv) Using very large time slices, it perform likes SJF algorithm

(i) Fixed Partitions:

(i) Are very common incumbent OS
(ii) Are very efficient in memory utilization
(iii) Are very inefficient in memory utilization
(iv) Are most used on large mainframe OS

(j) Concurrent process are:

(i) Process that overlap in time
(ii) Process that do not overlap in time
(iii) Process that are executed by the processor at the same time
(iv) None of the above
Group – B

Answer any four questions.

2. What is scheduler? Describe the short-term, medium term and long term scheduler. 15

3. What is process? What is process state? Explain with diagram. 15

4. What is deadlock? What are the necessary conditions for deadlock? 15

5. What is fragmentation? Explain and differentiate between internal and external fragmentation. 15

6. What is paging? What is demand paging? What is page fault? When does page fault occurs? 15

7. Write the short notes on the following: 15
   (a) Synchronization
   (b) File organization
   (c) Real time system
   (d) Buffering and Spooling

8. What is a directory? Describe its structure and also describe file allocation method. What is a

   EL – 10/1 (5) (Turn over)
threat? Describe various types of system or program threats and its preventive method. 15

9. Consider the following set of processes, with the length of the CPU given in ms: 15

<table>
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<tr>
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<th>CPU time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>10</td>
</tr>
<tr>
<td>P2</td>
<td>1</td>
</tr>
<tr>
<td>P3</td>
<td>2</td>
</tr>
<tr>
<td>P4</td>
<td>1</td>
</tr>
<tr>
<td>P5</td>
<td>5</td>
</tr>
</tbody>
</table>

(a) Calculate the waiting and turn around time using FCFS.
(b) Calculate the waiting and turn around time using SJF.
(c) Calculate the waiting and turn around time using RR when time slice 1 ms.

10. Differentiate between: 15
    (a) Segmentation and Paging
    (b) Scheduling and Scheduler
    (c) Multi Programming and Multi Tasking