Roll. No………………………… 1212107

M.Tech 2nd Semester Examination
May 2013
ADVANCED OPERATING SYSTEM
Subject Code: CSL-504

Time Allowed: 03 hours. Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Attempt any five questions and all questions carry equal marks.

Section – A

1. (a) Explain different types of design approaches of operating systems. (10)

(b) Explain different types of advanced operating system. (10)

2. What is safe state? Explain Banker’s Algorithm for deadlock avoidance. Consider the following snapshot of a system:

<table>
<thead>
<tr>
<th>Allocation</th>
<th>max available</th>
</tr>
</thead>
<tbody>
<tr>
<td>A B C</td>
<td>A B C</td>
</tr>
<tr>
<td>P0 0 1 0</td>
<td>7 5 3</td>
</tr>
<tr>
<td>P1 2 0 0</td>
<td>3 2 2</td>
</tr>
<tr>
<td>P2 3 0 2</td>
<td>9 0 2</td>
</tr>
<tr>
<td>P3 2 1 1</td>
<td>2 2 2</td>
</tr>
<tr>
<td>P4 0 0 2</td>
<td>4 3 3</td>
</tr>
</tbody>
</table>

Answer the following questions using banker’s algorithm: (20)

i) Is the system in a safe state?

ii) If a request from process P1 arrives for (1,0,2) can the request be granted immediately?

3. (a) How a serializer is different from Monitor? Write and explain a monitor to solve the readers-writers problem. (10)

(b) Explain critical section problem. Write and explain a semaphore to solve Producer-consumer problem. (10)

Section – B

4. (a) Explain Lamport’s Algorithm of distributed mutual exclusion using an example. (10)

(b) Why agreement protocols are used? Show that byzantine agreement can be reached among four processors where one processor is faulty. (10)

5. (a) Explain asynchronous checkpoint and recovery algorithm with example. (12)

(b) Explain nonblocking commit protocol. (8)

6. Explain various advanced models of protection in detail. (20)