MODEL EXAM QUESTION PAPER  
(2018-2019 EVEN SEMESTER)  

Year : II  
Sem : III  
Dept : CSE  
Marks : 100  
Time : 3 Hours  

CS 8493 – OPERATING SYSTEM  

PART – A  
(Answer All Questions)  
10 x 2 = 20  

1. Summarize the functions of DMA.  
2. Differentiate between tightly coupled systems and systems.  
3. List out the data fields associated with Process Control blocks.  
4. What is deadlock?  
5. Define External Fragmentation.  
6. Define virtual memory. Mention its advantages  
7. What is the advantage of bit vector approach in free space management?  
8. What is seek time and rotational latency?  
10. Illustrate the key features of android framework.  

PART – B  
(Answer All Questions)  
5 x 13 = 65  

11a. Explain the purpose and importance of system calls and discuss the calls related to device management and communication in brief.  

OR  

b. (i) Explain interrupts in detail.  
(ii) Explain various structures of an operating system structures and explain with a neat sketch.  

12a. (i) Evaluate the following snapshot of the system  
Available 1 5 2 0  
Allocation  Max  
A B C D  
P o 0 0 1 2 0 0 1 2  
P 1 1 0 0 0 1 7 5 0  
P 2 1 3 5 4 2 3 5 6  
P 3 0 6 3 2 0 6 5 2
Answer the follow based on banker’s algorithm.

1. Define safety algorithm (2)
2. What is the content of need matrix? (4)
3. Is the system in a safe state? (4)
4. Is a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately? (3)

OR

b. (i) Explain the FCFS, preemptive and non-preemptive versions of Shortest Job First and Round Robin (time-slice2) scheduling algorithms with Gantt Chart for the four processes given. Compare their average turn around and waiting time.

<table>
<thead>
<tr>
<th>Process</th>
<th>Burst Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>8</td>
</tr>
<tr>
<td>P2</td>
<td>4</td>
</tr>
<tr>
<td>P3</td>
<td>9</td>
</tr>
<tr>
<td>P4</td>
<td>5</td>
</tr>
<tr>
<td>P5</td>
<td>3</td>
</tr>
</tbody>
</table>

13a. Discuss in detail about paging with segmentation

OR

b. When do page faults occur? Consider the reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. Design the number of page faults occur for the FIFO, LRU and optimal replacement algorithms, assuming three, four page frames? (13)

14.a. (i) Describe with a neat sketch about the various directory structure.

(ii) Describe in detail about free space management.

OR

b. (i) Formulate by assuming the head of a moving disk with 200 tracks, numbered 0…199, is currently the disk head starts at 53 and the queue request is kept in the FIFO order, 98, 183, 37, 122, 14, 124, 65, 67. What is the total head movement needed to satisfy these requests for the SCAN, C-SCAN, LOOK and C-LOOK disk scheduling algorithms?

(ii) Compare the various disk scheduling algorithms. (4)

15a. (i) Write in detail about IOS and Android architecture.

(ii) Discuss in detail about IPC in Linux.
b. Explain in detail about the process management in Linux. (13)

PART – C (Answer All Questions) 1x 15= 15

16 a. What is deadlock? What are the necessary conditions for deadlock to occur? Explain the deadlock prevention method of handling deadlock. Consider the following information about resource in a system.

i) There are two classes of allocatable resource labelled R1 and R2

ii) There are two instance of each resource

iii) There are four processes labeled p1 through p4

iv) There are some instances already allocated to processes as follows:
   - one instance of R1 held by P2, another held by P3
   - One instance of R2 held by p1, another held by p4.

v) Some process have requested additional resources as follows:
   - p1 wants one instance of R1.
   - P3 wants one instance of R2

1) Draw the resource allocation graph for this system.
2) What is the state (Runnable, Waiting) of each process? For each process that is waiting for.
3) Is this system Deadlocked? If so, state which processes are involved. If not, give an execution sequence that eventually ends, showing resource acquisition and release at each step.

OR

b. Design an architecture and SDK framework for Android OS (15)