NEW

2016

BCA

4th Semester Examination

OPERATING SYSTEM

PAPER—2202

Full Marks : 100

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Answer Q. No. *1* and any *four* from the rest.

1. Answer any *five* questions : 5×2

(a) What is an Operating System ?

(b) State the methods through which information is passed in a computer system.

(c) When does a computer works in a Kernel mode ?

(d) What do you mean by Shell ?

(e) How does batch operating system works ?

(f) Give an example of program threats.

(g) What do you mean by dirty bit ?

2. (a) What is a System call ? Briefly explain the steps involved in system call.

(b) What is the significance of Process Control Block (PCB) ? Explain the components present in PCB.

8+7

3. (a) Consider a machine with 128 MB physical memory and a 32 bit virtual address space. If the page size is 2 KB, what is the approximate size of the page table ?

(b) Explain why inverted page tables reduce the page table size.

(c) What is external fragmentation ? Which system-paging or segmentation causes it and how ?

(d) On a demand pages system, it takes 120 ns to satisfy a memory request if the page is in memory. If the page is not in memory, a request takes on average 5 ms. What is the average memory access time if the page fault rate is 20%.

4+3+(2+3)+3

4. (a) Given the following :

Process	*Arrival Time* (ms)	*Burst time* (ms)
P_1	0	10
P_2	1	4
P_3	2	5

Find the average waiting time and the turn-around time for the following process scheduling algorithm :

(i) FCFS ;

(ii) SJF ;

(iii) Round Robin (Time Quantum = 5 ms).

(b) How the speed difference between CPU and memory is managed in a computer system ?

12+3

5. (a) What is FIFO page replacement algorithm ?

(b) How many page faults would occur for the following reference string for four page frames using LRU algorithm :

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2.

(c) What are the necessary conditions for deadlock ?

(d) How deadlock is detected ?

3+6+4+2

6. (a) Write down the difference between multiprogramming and multiprocessing.

   (b) Explain classical 'producer-consumer' problem. Write an algorithm for the solution of the problem using binary semaphore.

   (c) Why page size always power of 2 ?

   (d) Write down the advantages of direct file organization. 4+6+2+3

7. Write short notes on (any *three*) : 3×5

   (a) TLB ;

   (b) DMA ;

   (c) C-SAN disk scheduling ;

   (d) Dispatcher ;

   (e) Real time Operating System.

[*Internal Assessment — 30*]