NEW

2015

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. Define with example (any *five*) : 5×2

spooling, aging, swapping, multitasking, system call, multi-threading, batch-processor.

2. (a) What is safe state and unsafe state ?

(b) Write Banker's algorithm.

(c) Consider the following snapshot of a system :

Process	*Allocation*	*Max*	*Available*
	A B C D	A B C D	A B C D
P_1	0 0 1 2	0 0 1 2	2 1 0 0
P_2	2 0 0 0	2 7 5 0	
P_3	0 0 3 4	6 6 5 6	
P_4	2 3 5 4	4 3 5 6	
P_5	0 3 3 2	0 6 5 2	

Answer the following questions using the Banker's algorithm :

(i) Calculate the need matrix.

(ii) Is the system in a safe state or not ?

4+4+(2+5)

3. (a) What is Semaphore ? State and solve the readers' writers' problem with the help of Semaphore.

(b) How does logical address differ from physical address ?

(c) What are the different state of a process ? Discuss each of them. (3+4)+3+5

4. (a) Write down the difference between paging and segmentation.

(b) What is optimal page replacement algorithm ?

(c) Consider the following page-reference string :

1, 2, 3, 4, 2, 1, 5, 6, 1, 2, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6

How many page faults would occur for the optimal page replacement algorithms, assuming 3 frames ?

(d) What is multiuser system ? 4+3+5+3

5. (a) Explain briefly the hashed file organization.

(b) What is fixed partition ? Give its advantages and disadvantages.

(c) What is Belady's anomaly ? Give an example. 5+5+5

6. (a) What is the difference between preemptive and non-preemptive scheduling ?

(b) Explain priority scheduling algorithm.

(c) Consider the following set of processes :

Process	*Arrival time*	*CPU Burst time*
P_1	0	14
P_2	1	7
P_3	3	2
P_4	5	8

Draw the Grantt Chart for preemptive SJF scheduling and RR scheduling where time quantum q = 2 milliseconds.

Also find out average waiting time and average turn around time. 4+3+8

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

(a) Dining Philosophers problems.

(b) PCB.

(c) Multilevel Feedback Queue.

(d) GUI.

(e) Indexed Sequential file.

[Internal Assessment — 30]