QUESTION 2014

Group – A
(Multiple Choice Type Questions)

1. Answer all questions:

i) Which one of the following process states is not a valid process state?

a) blocked ✓b) load c) running d) none of these

ii) The scheduler, which selects jobs from the pool of jobs and loads them to the ready queue is

✓a) long term scheduler b) medium term scheduler
c) short term scheduler d) none of these

iii) Page fault occurs when

a) the page is corrupted by application software
b) the page is in main memory
✓c) the page is not in main memory
d) none of these

iv) In which of the following scheduling policies context switching will never take place

a) round robin ✓b) first cum-first served
c) pre-emptive d) shortest remaining time next (SRTN)

v) To avoid the race condition the number of processes that may be simultaneously inside their critical section is

a) 0 ✓b) 1 c) 2 d) 4

vi) Fork() is
- ✓a) creation of new job
- b) termination of a job
- c) increment of task priority
- d) none of these

vii) The Banker's algorithm is used
- ✓a) to prevent deadlock in operating systems
- b) to detect deadlock in operating systems
- c) to rectify a deadlock state
- d) none of these

viii) A process is
- a) a program
- b) a job
- ✓c) execution state of a program
- d) none of these

ix) Cipher text is
- a) normal text
- ✓b) encrypted text
- c) plain text
- d) none of these

x) CREATE is a
- ✓a) system call
- b) user's program call
- c) command
- d) none of these

Group – B
(Short Answer Type Questions)

2. Explain with examples the difference between preemptive and non-preemptive priority scheduling. Distinguish between 'starvation' and 'deadlock'.

1st part: See Topic: CPU SCHEDULING, Short Answer Type Question No. 6.
2nd part: See Topic: DEADLOCK, Short Answer Type Question No. 3.

3. Explain PCB with a neat diagram. Write down the different process states.

See Topic: PROCESS SYNCHRONIZATION, Short Answer Type Question No. 9.

4. Describe thrashing. Explain the demand paging in memory management scheme.

1st part: See Topic: MEMORY MANAGEMENT, Short Answer Type Question No. 7.
2nd part: See Topic: MEMORY MANAGEMENT, Short Answer Type Question No. 8.

5. Suppose that the following processes arrive for execution at the time indicated:

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

What is the average waiting time for these processes with
- (i) FCFS scheduling algorithm
- (ii) SJF scheduling algorithm
- (iii) RR scheduling algorithm.

See Topic: CPU SCHEDULING, Long Answer Type Question No. 4.a).

6. "Multi-programming implies multi-tasking, but the vice-versa is not true" – Explain.
See Topic: INTRODUCTION, Short Answer Type Question No. 2.

Group – C
(Long Answer Type Questions)

7. a) Explain the difference between process and program. Briefly discuss about process creation and termination.
b) Consider the following set of processes. CPU Burst time of them are given below in millisecond and priority of each processes are given.

Process	CPU Burst Time	Priority	Arrival Time
P1	8	3	0.0
P2	4	1	0.4
P3	1	2	1.0

Draw the Gantt chart for priority scheduling and SRTF scheduling. Calculate the average waiting time and average turnaround time also.
a) See Topic: PROCESS SYNCHRONIZATION, Long Answer Type Question No. 2.
b) See Topic: CPU SCHEDULING, Long Answer Type Question No. 6.

8. a) What is critical section problem? What are the requirements that the solution to critical section problem must satisfy?
b) What is Semaphore? How is it accessed? Explain the Dining Philosopher's problem and give the solution of it, using Semaphore.
See Topic: PROCESS SYNCHRONIZATION, Long Answer Type Question No. 6.

9. a) What is swapping? What is its purpose?
b) Consider the following sequence of memory references generated by a single program in a pure paging system:
10, 11, 104, 170, 173, 177, 309, 245, 246, 247, 458, 364.
Determine the number of page faults for each of the following page replacement policies assuming three (3) page frames are available and all are initially empty. The size of a page is 100 words:
(i) LRU
(ii) FIFO
(iii) Optimal page replacement.
See Topic: MEMORY MANAGEMENT, Long Answer Type Question No. 5.

10. a) What is system deadlock? Explain necessary conditions of deadlock.
b) Explain resource allocation algorithm with proper example.
c)

process	Allocated resources	Maximum requirement of resources
A	4	14
B	5	8
C	3	7

Available resource in the system: 15. Check whether it is in safe or not with proper reasoning.
a) 1st part: See Topic: DEADLOCK, Long Answer Type Question No. 5.a).
2nd part: See Topic: DEADLOCK, Short Answer Type Question No. 1.
b) See Topic: DEADLOCK, Long Answer Type Question No. 6.
c) See Topic: DEADLOCK, Long Answer Type Question No. 9.

11. Write short notes on any three of the following:
    a) FIFO disk scheduling algorithm
    b) Process State Diagram
    c) Virtual memory
    d) Context switch
    e) Virtual machine

a) See Topic: DISK MANAGEMENT, Long Answer Type Question No. 3.b).
b) See Topic: PROCESS MANAGEMENT, Long Answer Type Question No. 8.b).
c) See Topic: MEMORY MANAGEMENT, Long Answer Type Question No. 9.f).
d) See Topic: PROCESS SYNCHRONIZATION, Long Answer Type Question No. 7.g).
e) See Topic: INTRODUCTION TO SYSTEM STRUCTURE, Long Answer Type Question No. 3.