

Name :

Roll No. :

Invigilator's Signature :

CS/BCA/SEM-3/BCA-301/2011-12

2011

OPERATING SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

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

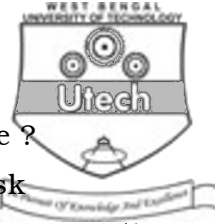
GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) The technique of temporarily removing inactive programs from the memory of a computer system is
 - a) switching
 - b) swapping
 - c) paging
 - d) none of these.
- ii) The time required for read-write head to travel to target cylinder is called
 - a) latency time
 - b) seek time
 - c) transfer time
 - d) none of these.
- iii) The technique of relocating all occupied areas of storage to one end is called
 - a) sharing
 - b) relocation
 - c) compaction
 - d) distribution.



- iv) Which of the following statements is false ?
 - a) Implicit task is a system-defined task
 - b) A process is an instance of a program execution
 - c) Buffering is a sophisticated form of spooling
 - d) Time-sharing system follows Round-robin algorithm.
- v) The coincidence of high page traffic and low CPU utilization is
 - a) Belady's Anomaly
 - b) Mutual Exclusion
 - c) Deadlock
 - d) Thrashing.
- vi) Which scheduling algorithm is inherently preemptive ?
 - a) FCFS
 - b) SJF
 - c) RR
 - d) Priority scheduling.
- vii) The optimal scheduling algorithm is
 - a) FCFS
 - b) SJF
 - c) RR
 - d) None of these.
- viii) Thrashing
 - a) reduces page I/O
 - b) decreases the degree of multiprogramming
 - c) implies excessive page I/O
 - d) improves the system performance.
- ix) Fork is
 - a) the creation of a new job
 - b) the dispatching of a task
 - c) increasing the priority of a task
 - d) the creation of new task.
- x) RMI stands for
 - a) Remote Method Interface
 - b) Remote Message Interface
 - c) Remote Method Invocation
 - d) None of these.



GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Consider the following resource allocation state involving processes P0, P1, P2, P3 and P4 and resources R0, R1, R2, R3 and R4 :

Resources Assigned				Resources Still Needed					
Processes	Resources				Processes	Resources			
	R1	R2	R3	R4		R1	R2	R3	R4
A	3	0	1	1	A	1	1	0	0
B	0	1	0	0	B	0	1	1	2
C	1	1	1	0	C	3	1	0	0
D	1	1	0	1	D	0	0	1	0
E	0	0	0	0	E	2	1	1	0

Available resources = 1 0 2 0

Determine whether the system is in a safe state or not.

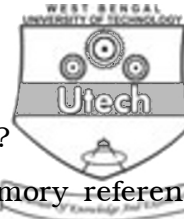
3. Explain with examples the difference between preemptive and non-preemptive priority scheduling.
4. Distinguish between 'starvation' and 'deadlock'.
5. Explain PCB with a neat diagram.
6. What is thread ? Compare it with process. $2 + 3$

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Explain the following file access methods : 3×3
- i) Direct
 - ii) Sequential
 - iii) Indexed Sequential.
- b) What is Memory Compaction ? What is its use ? $3 + 3$



8. 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. 3 + 4 + 4 + 4
9. a) Describe a system model for deadlock.
- b) Explain the combined approach to deadlock handling.
- c) Differentiate process switching and context switching. 5 + 5 + 5
10. a) Explain Mutual exclusion.
- b) Write the first algorithm of mutual exclusion algorithm.
- c) What are its problems ? 5 + 7 + 3
11. Write short notes on any *three* of the following : 3 × 5
- a) Round Robin Scheduling
- b) Thrashing
- c) Virtual memory
- d) Paging and Segmentation.
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