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Question Paper Code: 53805

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Computer Science and Engineering

15UIT305 OPERATING SYSTEMS

(Common to Information Technology)

(Regulation 2015)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The number of processes completed per unit time is known as CO1- U
(a) Output (b) Throughput (c) Efficiency (d) Capacity
2. The user view of operating system is designed mostly for CO1- R
(a) resource utilization (b) ease of use
(c) controlled program (d) command mode
3. Termination of the process terminates CO2- U
(a) First thread of the process (b) First two thread of the process
(c) All threads within the process (d) No thread within the process
4. The processes that are residing in main memory and are ready and waiting CO2- U
to execute are kept on a list called
(a) job queue (b) ready queue (c) execution queue (d) process queue
5. If the resources are always preempted from the same process, _____ can occur. CO3- U
(a) Starvation (b) Deadlock (c) System crash (d) Aging
6. Consider a set of n tasks with known runtimes r_1, r_2, \dots, r_n to be run on a CO3- R
uniprocessor machine. Which of the following processor scheduling
algorithms will result in the maximum throughput?
(a) Round-Robin (b) Shortest job First (c) Priority (d) First-Come-First-Served

7. Thrashing _____ the CPU utilization. CO4- U
- (a) Increases (b) Keeps constant (c) Infinity (d) Decreases
8. _____ page replacement algorithm suffers from Belady's anomaly. CO4- R
- (a) FIFO (b) Optimal (c) LIFO (d) LRU
9. What is raw disk? CO5- U
- (a) Disk without file system (b) Disk lacking logical file system
(c) Disk having file system (d) Empty disk
10. The _____ keeps state information about the use of I/O components CO5- R
- (a) CPU (b) OS (c) kernel (d) shell

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Define process and co-operating process. Draw process state diagram and explain all states. With a neat sketch, explain the concept of inter process communications. CO1- U (8)
12. Consider the following set of processes, calculate average waiting time and average turn around time using FCFS, SJF, Priority (Highest number implies highest priority) and RR (time quantum = 5sec) CPU scheduling algorithms. All the processes are arrived in the following order at time 0 sec. CO2- App (8)

Process	Burst Time(sec)	Priority
A	10	5
B	5	10
C	8	4
D	13	8

13. Consider a system with 5 processes (P_0, P_1, P_2, P_3, P_4) and 3 resource types such as 7 instances of A, 2 instances of B, 6 instances of C. Resource-allocation state at time t_0 : CO3- U (8)

Process	Allocation			Maximum		
	A	B	C	A	B	C
P_0	0	1	0	1	1	0
P_1	2	0	0	4	0	2
P_2	3	0	3	4	0	3
P_3	2	1	1	3	1	1
P_4	0	0	2	0	0	4

- (i) Write the Available and Need matrix.

- (ii) Is the system in a deadlocked state? If yes, justify your answer for deadlock. If not, which sequence results in $\text{finish}[i] == \text{true}$ for all P_i ?
14. Consider the following page reference string CO4-U (8)
5, 6, 7, 0, 5, 1, 2, 0, 5, 3, 0, 4, 2, 3, 6, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
How many page faults would occur for the following replacement algorithms?
LRU, FIFO and Optimal
Assuming three frames that all frames are initially empty.
15. A hard disk having 500 cylinders / tracks, numbered from 0 to 499. The drive CO5- U (8)
is currently serving the request at cylinder 143, and the previous request was
at cylinder 125. The status of the queue is as follows: 86, 470, 13, 177, 448,
150, 102, 175, 130 What is the total distance (in cylinders) that the disk arm
moves to satisfy all the pending requests for each of the following disk -
scheduling algorithms?
(i) FCFS
(ii) C-SCAN
(iii) LOOK
(iv) SSTF