RN190012255

Registration No:

Total Number of Pages : 2   AR-17   B.TECH

B.TECH 5th SEMESTER EXAMINATIONS, NOV/DEC 2019
BCSOE5051 OPERATING SYSTEM
Common to AEIE,ECE BRANCH

Time : 3 Hours   Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer *All* Questions

a   For system protection, a process should access   [CO 1] [PO 1]
    (a) all the resources
    (b) only those resources for which it has authorization
    (c) few resources but authorization is not required
    (d) all of the mentioned

b   In a multiprogramming environment   [CO 1] [PO 1]
        (a) More than one process resides in the memory
        (b) The programs are developed by more than one person
        (c) The processor executes more than one process at a time
        (d) A single user can execute many programs at the same time

c   A thread is also called :   [CO 1] [PO 1]
        (a) Light Weight Process(LWP)
        (b) Heavy Weight Process(HWP)
        (c) Process
        (d) None of the mentioned

d   A process is   [CO 2] [PO 1]
        (a) Program in high level language kept on disk   (b) contents of main memory
        (c) A program in execution   (d) a job in secondary memory

e   In a time sharing operating system, when the time slot given to a process is completed, the process   [CO 2] [PO 1]
    goes from the running state to the
        (a) Ready state   (b) Blocked state
        (b) Terminated state   (d) Suspended state

f   Pre-emptive scheduling, is the strategy of temporarily suspending a running process   [CO 2] [PO 2]
        (a) When it requests (I/O)   (b) to allow starving process to run
        (c) Before the CPU time slice expires   (d) None of the above

g   A solution to the problem of external fragmentation is :   [CO 3] [PO 1]
        (a) compaction
        (b) larger memory space
        (c) smaller memory space
        (d) none of the mentioned

h   The LRU algorithm   [CO 3] [PO 2]
        (a) Pages out pages that have been used recently
        (b) Pages out pages that have not been least used recently
        (c) Pages out pages that have been least used recently
        (d) Pages out the first page in page in a given area

i   In which type of allocation method each file occupy a set of contiguous block on the disk?   [CO 4] [PO 1]
        (a) indexed allocation
        (b) dynamic-storage allocation
        (c) linked allocation
        (d) contiguous allocation

j   The set of tracks that are at one arm position make up a _____   [CO 4] [PO 1]
    (a) assemblies
    (b) magnetic disks
    (c) electrical disks
    (d) cylinders

PART – B: (Short Answer Questions) 10X2=20 Marks

Q.2. Answer _ALL_ questions

a   What are the main functions of Operating System   [CO 1] [PO 1]
b   What is a thread?   [CO 1] [PO 1]
c   What are the advantages of a multiprocessor system?   [CO 2] [PO 2]
d   Differentiate long term scheduler and short term scheduler   [CO 2] [PO 2]
e   What is meant by context switch?   [CO 2] [PO 1]
f   What are the conditions under which a dead lock system can occur?   [CO 3] [PO 2]
g   When does thrashing occur?   [CO 3] [PO 1]
h   What is a virtual memory?   [CO 3] [PO 1]
i   Define seek time and latency time.   [CO 4] [PO 1]
j   What does access matrix represent?   [CO 4] [PO 1]

PART – C: (Long Answer Questions) 4X15=60 Marks

Answer _ALL_ questions

Q.3

a   List out the various services of operating system with explanation.   8   [CO1] [PO1]
b   Write a brief note on distributed and real time systems   7   [CO1] [PO1]

OR

c   Distinguish between multiprogramming and multi-tasking operating systems. What are the   8   [CO1] [PO2]
     key motivations for the development of each?
d   Define a System call and explain the various types of systems calls with an example of each   7   [CO1] [PO1]

Q.4

Consider the following set of processes with their CPU burst time given in milliseconds: [CO2] [PO2]

Process	CPU burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

a   8

The processes are assumed to have arrived in the order P1,P2,P3,P4 and P5 all at time 0. Draw three Gantt charts illustrating the execution of these processes using FCFS, SJF and RR(time quantum = 1) scheduling.

b   What is a Critical Section problem? Give the conditions that a solution to the critical section   7   [CO2] [PO1]
     problem must satisfy.

OR

c   Suppose that the following processes arrive for execution at the times indicated. Each process   [CO2] [PO2]
     will run the listed amount of time. In answering the questions, use non preemptive scheduling
     and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

                                                                                   8

(a) Construct the Gantt charts illustrating the execution of these processes using FCFS and SJF.

(b) Calculate the average turnaround time for these processes with the SJF scheduling algorithm?

| d | Dramatize the working of semaphore with suitable example | 7 | [CO2] [PO1] |

Q.5

| a | Explain clearly about the demand paging scheme with hard wired diagram | 7 | [CO3] [PO1] |
| b | Explain the Resource-Allocation-Graph algorithm for deadlock avoidance. | 8 | [CO3] [PO2] |

OR

| c | Consider the following page reference string:
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6
How many page faults would occur for the FIFO and LRU page replacement algorithm, assuming three frames and all frames are initially empty. | 7 | [CO3] [PO2] |
| d | Consider the following snapshot of a system. | 8 | [CO3] [PO2] |

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	2	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm:
- (a) What is the content of the matrix Need?
- (b) Is the system in a safe state?

Q.6

| a | Explain any two file access methods | 6 | [CO4] [PO1] |
| b | Discuss various file allocation methods of disks | 9 | [CO4] [PO1] |

OR

| c | Explain the directory structure | 6 | [CO4] [PO1] |
| d | Describe any three disk scheduling algorithms and calculate the total head movement in each algorithm for the following disk queue with requests for I/O to blocks on cylinders:
    98, 183, 37, 122, 14, 124, 65, 67
Head pointer initially at 53 | 9 | [CO4] [PO1] |

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