

[4]

- Q.5 i. Describe the differences between demand paging and segmentation. 4
ii. What do you mean by page replacement? Discuss page replacement algorithms with suitable examples. 6
- OR iii. Why do page fault occurs. Describe in detail the action taken by operating system when page fault occurs. 6
- Q.6 Attempt any two:
- i. What problems might arise on deletion if file is shared? 5
ii. Explain various file access methods. 5
iii. Explain the directory system. What are the operations that can be performed on a directory? 5

Total No. of Questions: 6

Total No. of Printed Pages:4

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2018
CS3CO09/ IT3CO08 Operating Systems

Programme: B.Tech.

Branch/Specialisation: CSE / IT

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. The part of machine level instruction, which tells the central processor what has to be done, is 1
(a) Operation code (b) Address
(c) Locator (d) Pointer
- ii. A co-processor 1
(a) Is relatively easy to support in software
(b) Causes all processor to function equally
(c) Works with any application
(d) Is quite common in modern computer
- iii. Which module gives control of the CPU to the process selected by the short-term scheduler 1
(a) Visualizing (b) Interrupt
(c) Scheduler (d) Dispatcher
- iv. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first 1
(a) Shortest job scheduling
(b) First-come, first-served scheduling
(c) Priority scheduling
(d) None of these
- v. Which one of the following is the address generated by CPU 1
(a) Physical address (b) Absolute address
(c) Logical address (d) All of these

P.T.O.

[2]

- vi. In fixed sized partition, the degree of multiprogramming is bounded by **1**
 (a) The CPU utilization (b) The number of partitions
 (c) The memory size (d) All of these
- vii. Because of virtual memory, the memory can be shared among **1**
 (a) Processes (b) Threads
 (c) Instructions (d) None of these
- viii. When a program tries to access a page that is mapped in address space but not loaded in physical memory, then **1**
 (a) Segmentation fault occurs (b) Fatal error occurs
 (c) Page fault occurs (d) No error occurs
- ix. In the file organization, data are collected in the order in which they arrive where each record consists of one burst of data **1**
 (a) Pile (b) Sequential
 (c) Indexed sequential (d) Indexed
- x. are typically used in batch applications and are generally optimum for such applications if they involve the processing of all the records **1**
 (a) Indexed files (b) Direct files
 (c) Sequential files (d) Indexed Sequential files

Q.2

- Attempt any two:
- i. Explain the functions of operating system. **5**
- ii. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and disadvantages of multiprocessor systems? **5**
- iii. Describe the differences between Hard and Soft real time systems. **5**

Q.3

- i. On a system with n CPUs, what is the minimum number of processes that can be in the ready, run and blocked states? **3**
- ii. We wish to schedule three processes P1, P2, P3 on a uniprocessor system. The priorities, CPU time requirements and arrival times of the processes are as shown bellow. **7**

[3]

Process	Priority	CPU time required (sec)	Arrival time(sec)
P1	10(highest)	20	05
P2	9	10	03
P3	8	15	00

- Calculate: (a) Turn Around Time (TAT) for each process
 (b) Waiting time for each process.
 (c) Average waiting time

Solve using non-pre-emptive priority scheduling algorithm.

- OR iii. Consider the following snapshot of a system: **7**

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	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?
 (c) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately?

Q.4

- Attempt any two:
- i. Explain in brief, logical and physical address space. **5**
- ii. On a simple paging system with 2^{24} bytes of physical memory, 256 pages of logical address space, and a page size of 2^{10} bytes, how many bits are in a logical address? **5**
- iii. Given memory partitions of 100K, 500K, 200K, 300K and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212K, 417K, 112K, and 426K (in order). Which algorithm makes the most efficient use of memory. **5**

P.T.O.

Marking Scheme

CS3CO09/ IT3CO08 Operating Systems

Q.1	i. The part of machine level instruction, which tells the central processor what has to be done, is (a) Operation code	1		
	ii. A co-processor (a) Is relatively easy to support in software	1		
	iii. Which module gives control of the CPU to the process selected by the short-term scheduler (d) Dispatcher	1		
	iv. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first (b) First-come, first-served scheduling	1		
	v. Which one of the following is the address generated by CPU (c) Logical address	1		
	vi. In fixed sized partition, the degree of multiprogramming is bounded by (b) The number of partitions	1		
	vii. Because of virtual memory, the memory can be shared among (a) Processes	1		
	viii. When a program tries to access a page that is mapped in address space but not loaded in physical memory, then (c) Page fault occurs	1		
	ix. In the file organization, data are collected in the order in which they arrive where each record consists of one burst of data (a) Pile	1		
	x. are typically used in batch applications and are generally optimum for such applications if they involve the processing of all the records (c) Sequential files	1		
Q.2	Attempt any two: i. Any five functions of operating system 1 mark each (1 mark * 5)	5		
	ii. Two differences between symmetric and asymmetric multiprocessing 1 mark each (1 mark * 2) Three advantages and disadvantages of multiprocessor systems 1 mark each (1 mark * 3)	5 2 marks 3 marks		
	iii. Any three differences between Hard and Soft real time systems	5		
Q.3	i. On a system with n CPUs, processes that can be in the ready, run and blocked states 1 mark for each (1 mark * 3)	3		
	ii. Calculate: (a) Turn Around Time (TAT) for each process (b) Waiting time for each process. (c) Average waiting time	2.5 marks 2.5 marks 2 marks	7	
OR	iii. 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 (c) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately	3 marks 2 marks 2 marks	7	
Q.4	Attempt any two: i. Logical and physical address space 2.5 marks each (2.5 marks * 2) ii. How many bits are in a logical address iii. For numerical For name of algorithm	2.5 marks each 4 marks 1 mark	5 5 5	
Q.5	i. Demand paging Segmentation. ii. Definition of page replacement Any three page replacement algorithms with examples 1.5 marks for each (1.5 marks * 3)	2 marks 2 marks 1.5 marks 4.5 marks	4 6	
OR	iii. For reason For description	2 marks 4 marks	6	
Q.6	Attempt any two: i. Problems might arise on deletion if file is shared ii. Any two file access methods 2.5 marks each (2.5 marks * 2) iii. Definition directory system Any three operations 1 mark for each (1 mark * 3)	2 marks 2 marks 3 marks	5 5 5	
