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10EC65

Sixth Semester B.E. Degree Examination, June/July 2014

Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the goals of an operating system. **(06 Marks)**
b. Explain the designer's view of operating system. **(04 Marks)**
c. Explain modes of performing I/O operations. **(05 Marks)**
d. Explain the benefits/features of distributed operating system. **(05 Marks)**

2 a. Explain the functions of an operating system. **(05 Marks)**
b. Explain the layered design of operating system. **(08 Marks)**
c. Explain the concept of VMOS with example. **(07 Marks)**

3 a. Explain the contents of process control block. **(06 Marks)**
b. List the different types of process interaction and explain them in brief. **(06 Marks)**
c. Explain with a neat diagram, the different states of process in UNIX operating system. **(08 Marks)**

4 a. Describe static and dynamic memory allocation. **(04 Marks)**
b. Compare the contiguous and non-contiguous memory allocation. **(04 Marks)**
c. What is boundary tag? Explain merging of free areas using boundary tags? **(08 Marks)**
d. Explain the lazy buddy allocator. **(04 Marks)**

PART – B

5 a. Explain the important concepts in the operation of demand paging. **(12 Marks)**
b. Find the number of page faults for following page reference string, using the FIFO and LRU page replacement policies.
Reference string: 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5. (Assume page frames = 3) **(08 Marks)**

6 a. Describe the different operations performed on files. **(08 Marks)**
b. Explain the organization of sequential access and direct access files. **(08 Marks)**
c. Describe file system actions during a file operation. **(04 Marks)**

7 a. Compute mean turn around time and mean weighted turn around time for following set of processes, using FCFS and SRN scheduling. **(10 Marks)**

Processes	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	5	8
Service time	3	3	2	5	3

b. Explain the process schedule with a neat schematic diagram. **(05 Marks)**
c. Summarize the approaches to real time scheduling. **(05 Marks)**

8 a. Explain Buffering of interprocess messages. **(06 Marks)**
b. Describe the delivery of interprocess messages. **(06 Marks)**
c. Write a short note on mailbox. **(08 Marks)**

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10EC65

Sixth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Define an operating system. What are the different facets of user convenience? **(06 Marks)**

b. Explain partition based and pool based resource allocation strategies. **(06 Marks)**

c. Explain time sharing operating system with respect to, i) Scheduling and ii) Memory management. **(08 Marks)**

2 a. What are the functions of an operating system? Explain. **(06 Marks)**

b. Explain virtual machine operating system (VMOS). What are the advantages of using virtual machines? **(08 Marks)**

c. In a batch processing system, the results of 1000 students are to be printed. Reading a card or printing a result needs 100 msec whereas read/write operation in a disck needs only 20 msec. Processing a record needs only a 10 msec of CPu time. Compute the program elapsed time and CPu idle time with and without spooling. **(06 Marks)**

3 a. What is a process? What are the components of a process? Explain. **(04 Marks)**

b. Explain with neat diagrams, i) User threads ii) Kernel level threads. **(08 Marks)**

c. With a neat diagram, explain different states of a process and state transitions in the UNIX operating system. **(08 Marks)**

4 a. Explain the techniques used to perform memory allocation by using a free list. **(10 Marks)**

b. Explain internal and external fragmentation with examples. **(06 Marks)**

c. Compare contiguous and non-contiguous memory allocation methods. **(04 Marks)**

PART – B

5 a. What are the functions performed by the virtual memory manager? Explain. **(08 Marks)**

b. For the following page reference string, calculate the number of page faults with FIFO and LRU page replacement policies when i) Number of page frames are three ii) Number of page frames are four.

Page reference string : 5 4 3 2 1 4 3 5 4 3 2 1 5

Reference time string : $t_1, t_2, t_3, \ldots\ldots, t_{13}$ **(12 Marks)**

6 a. With a neat diagram, explain the facilities provided by the file system and IOCS layers. **(08 Marks)**

b. Explain the index sequential file organization with an example. **(08 Marks)**

c. What is a link? With an example, illustrate the use of a link in an acyclic graph structure directory. **(04 Marks)**

7 a. Compare : i) Preemptive and non-preemptive scheduling ii) Long term and short term schedulers. **(08 Marks)**

b. Describe the shortest request next (SRN) and highest response ratio next (HRN) scheduling policies and determine the average turn around time and weighted turn around time for the following set of processes shown in Table Q7 (b). **(12 Marks)**

Table Q7 (b)

Processes	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	4	8
Service time	3	3	5	2	3

8 a. Explain i) Direct and indirect naming.
ii) Blocking and non blocking sends. **(06 Marks)**

b. What is a mail box? With an example, explain the features of mailboxes and its advantages. **(08 Marks)**

c. Explain pipes and message queues in UNIX. **(06 Marks)**

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