USN [| | | | | | | | |] **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.***

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 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 : $t_1, t_2, t_3, \ldots\ldots\ldots, t_{13}$ **(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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