Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES (SOIS)
SECOND SEMESTER MASTER OF SCIENCE - M.Sc. (INFORMATION SCIENCES)
DEGREE EXAMINATION - APRIL / MAY 2017
Friday, 28,2017
Time :10:00AM- 1:00PM

Operating Systems - Elective 1 [MIS 510.1]

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1) Answer the following (5marks each) (10)
(A)What is meant by context switch and describe how it takes place.
(B)Explain the terms: (i) multiprogramming (ii) multitasking

2) Answer the following. (5 marks each) (10)

(A) Explain the differences between a process and a program.
(B) Describe a process control block and explain its use.

3) What is meant by multithreading? List and explain the 3 multithreading models with neat diagrams. (10)

4) With neat diagrams explain the scheduling algorithms (each carry 5 marks) (10)

(i) Round Robin Scheduling
(ii)Multilevel Feedback Queue Scheduling.

5) What do you understand by message passing? Explain this scheme under (i) direct communication and (2) indirect communication. (10)

6) Write the structure of the producer process as well as the consumer process in the classical solution to "Bounded buffer" critical section (10)

problem. Clearly indicate (i) the number of semaphores used (ii) their initial values (iii) purpose of using them.

7) What is the difference between deadlock prevention and deadlock avoidance? How can you achieve deadlock prevention? Explain. (10)

8) Draw the diagram of paging hardware with TLB and explain the significance of TLB. (10)

9) Consider a page size of 100 bytes and the following memory address reference string:1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 (10)
How many page faults would occur for the following replacement algorithms, assuming

FOUR page frames?
(i) LRU replacement
(ii) FIFO replacement
(iii) Optimal replacement.

10) Given memory partitions of 200K, 600K, 300K, 400K, 250K and 700K (in order), how would each of the First-fit, Best-fit and worst fit algorithms place the memory segments of processes of 256K, 220K 312K, 517K, 212K and 526K (in order)? In this case which algorithm makes most efficient use of memory? (10)