U.S.N | | | | | | | | | | |

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Information Science and Engineering

Semester End Examination; June - 2016

Operating System

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. What are the activities for which the OS is responsible for in connection with, 10
i) Process management ii) File management

b. Explain any two types of system calls. 5

c. What are VM? Explain the benefit of creating virtual machine (VM). 5

2 a. Differentiate between : 6
i) User level thread and Kernel level thread ii) Process and Thread

b. Explain different types of scheduler. 6

c. What is IPC? Explain message passing system in detail. 8

UNIT - II

3 a. The following processes arrive for execution at times indicated. Draw the Gantt chart and Calculate Average waiting time for : 10
i) FCFS scheduling ii) SJF scheduling iii) Round Robin scheduling

Process	Arrival time	Burst time in ms
P1	0	5
P2	1	3
P3	2	8
P4	3	6

b. Explain multiple processor scheduling. 4

c. Explain the scheduling criteria considered for process management. 6

4 a. What do you mean by binary semaphore and counting semaphore? Explain the implementation of wait and signal operation. 10

b. Explain any one synchronisation problem for testing newly proposed synchronization scheme. 5

c. What is race condition? List the requirements that a solution to critical section must satisfy. 5

UNIT - III

5 a. What is dead lock? Explain the four necessary conditions for a dead lock. 5

Contd….2

b. Consider the following snapshot.

Allocation				Max			Available		
Process	A	B	C	A	B	C	A	B	C
P0	0	0	2	0	0	4	1	0	2
P1	1	0	0	2	0	1			
P2	1	3	5	1	3	7			
P3	0	3	2	8	4	2			
P4	1	4	3	1	5	7			

Is the system in a safe state? If a request from process P2 arrives (0, 0, 2). Can this request be granted immediately? 10

c. Explain how circular wait condition can be prevented from occurring. 5

6. a. What are the drawbacks of contiguous memory allocation? Given fixed memory partition of 100 kb, 500 kb, 200 kb, 300 kb, 600 kb. How would each of the first fit, best fit, and worst fit algorithm places:

212 kb, 417 kb, 112 kb and 426 kb inorder which algorithm makes efficient use. 6

b. Explain internal fragmentation. Can we completely remove internal fragmentation using segmentation? 8

c. Explain how page table can be improved for paging. 6

UNIT - IV

7 a. Consider the following page reference string ,

R = 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Compute the page faults for :

i) FIFO ii) LRU iii) Optimal. 10

b. Explain demand paging. 10

8 a. Explain different file allocation methods. 10

b. Explain different types of directory structures with example. Mention its advantages and disadvantages. 10

UNIT - V

9 a. With an example distinguish between SSTF, FCFS, SCAN and look disk scheduling. 10

b. Differentiate between boot block and bad blocks. 5

c. Explain in brief selection of disk scheduling algorithm. 5

10 a. What is protection? Distinguish between mechanism and policies. Explain briefly access matrix with domains as objects. 10

b. When do we need to revoke the access right? Explain the revocation of capabilities. 6

c. Explain lock-key mechanism to compromise between access list and capability list. 4

* * * *