

**Government College of Engineering, Aurangabad**  
(An Autonomous Institute of Government of Maharashtra)

**TE(CSE) Examination**

End Semester Examination Nov 2016

**CS 345: Operating System**

*Time: Three Hours*

**22 NOV 2016**

**Max Marks:60**

*“Verify the Course Code and check whether you have got correct question paper”*

**N.B:-**

1. All questions are compulsory
2. Figures to the right indicate full marks
3. Assume suitable data if necessary and state it clearly
4. Use of non-programmable calculator is allowed

**Q.1 Attempt the following**

**12**

- A. List four services provided by an operating system. Explain how each provides convenience to the users.
- B. i. Whether the timesharing differs from multiprogramming? Justify your answer.  
ii. Differentiate between Network Operating System and Distributed Operating System.

**Q.2 Attempt any 2**

**12**

- A. Explain the FCFS, pre-emptive and non-pre-emptive versions of Shortest Job First and Round Robin (time-slice) scheduling algorithms with Gantt chart for the four processes given. Compare their average turn around and wait time.  
Processes are assumed to arrive in the order P1, P2, P3, P4, P5 all at time 0. (Smallest priority no. implies a higher priority. )

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

- B. Compare the advantages of threads over multiple processes? What Major advantages do they have? Give your answer Can user-level threads achieve better performance on a multiprocessor system than on a single processor system? Compare user threads and kernel threads.
- C. Consider the deadlock situation that occurs in the dining philosopher’s problem when the philosophers obtain the chopsticks one at a time. Discuss how the four necessary conditions for deadlock holds in this setting. Discuss how deadlocks could be avoided by eliminating any one of the four necessary conditions.

**Q.3 Attempt any 2**

**12**

- A. Given memory partitions of size 100 KB, 500 KB, 200 KB, 300 KB and 600 KB in order, how would each of the first-fit, best-fit and worst-fit algorithms place processes of size 212 KB, 417 KB, 112 KB, 426 KB (in order). Which algorithms make the most efficient use of memory?
- B. Discuss page replacement algorithms in detail with suitable example.
- C. With a neat sketch and suitable example, show how logical address is translated into physical address using paging scheme.

**Q.4 Attempt any 2**

**12**

- A. Compare the various disks scheduling algorithms.
- B. How swap space is used? Where the swap space is located in disk? How swap is managed?
- C. What is the function of system clock? Is there any difference between system clock and CPU clock? If yes then what is the function of CPU clock?

**Q.5 Attempt the following**

**12**

- A. Classify the different file allocation methods with neat diagram. Mention the advantages and disadvantages of each.
- B. Explain the use of directory in organization of files. Discuss the Tree Structured Directory and Acyclic Graph Directory.