

B.TECH. SEM -VI (COMPUTER) 2014 COURSE (CBCS) :

WINTER - 2017

SUBJECT: OPERATING SYSTEM

Day : **Monday**
Date : **20/11/2017**

Time: **10.00 AM TO 01.00 PM**
Max. Marks: **60**

W-2017-2193

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Use of non- programmable calculator is **ALLOWED**.
- 3) Figures to the right indicate **FULL** marks.
- 4) Draw a neat and labeled diagram **WHEREVER** necessary.
- 5) Assume suitable data, if necessary.

Q.1 a) What is the purpose of system calls, and how do system calls relate to the operating system concept of dual mode (kernel / user) operation? **(05)**

b) List five services provided by an operating system that are designed to make it more convenient for users to use the computer system. In what cases it would be impossible for user level programs to provide these services? Explain. **(05)**

OR

a) What is Kernel? Explain the difference between monolithic kernel and Micro kernel. **(05)**

b) Define operating system. What are the objectives and functions of operating system? **(05)**

Q.2 a) What is PCB? Enumerate and explain various fields in PCB. **(05)**

b) What is multithreading? Explain the benefits of multithreaded programming. **(05)**

OR

a) Define race condition. List the requirements that a solution to critical section problem must satisfy. **(05)**

b) Define semaphores? What are the advantages of semaphores? Explain two primitive semaphore operations. **(05)**

Q.3 a) Explain the following methods with an example to recover from deadlock **(05)**
1. Process termination 2. Resource Preemption

b) Explain how resource- allocation graph is used to describe deadlock. **(05)**

OR

a) Justify the usefulness of Banker's algorithm in an operating system. **(05)**

b) A safe state is not a deadlock state, but a deadlock state is an unsafe state. Explain. **(05)**

Q.4 Consider the page reference strings: 1,2,3,4,2,5,3,4,2,6,7,8,7,9,7,8,2,5,4 and 9. **(10)**
How many page faults would occur for LRU, FIFO and optimal page replacement algorithms when the number of frames is three?

OR

Mention the problem with simple paging scheme. How TLB is used to solve this problem? Explain with supporting H/W diagram and with an example. **(10)**

Q.5 a) Explain in detail tree structured directory organization of file system. **(05)**

b) Describe the principles to be incorporated to improve the efficiency of input-output systems **(05)**

OR

a) List the method used to allocate disk space for file system. Discuss any one method's working, advantage and disadvantages in detail. **(05)**

b) Describe the access matrix model used for file protection in a file system **(05)**

Q.6 Explain the Architecture and application I/O interface in detail for Android Operating System. **(10)**

OR

What is virtual machine? Explain in detail VMware architecture with a neat diagram. **(10)**