Printed pages: 2 **Sub Code ; ECS501**

Paper Id: | 1 | 0 | 2 | 3 | **Roll No.** | | | | | | | | | |

B.TECH

(SEM. V) THEORY EXAMINATION 2017-18

OPERATING SYSTEM

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. **2 x10 = 20**

a. Define kernel.
b. What are batch systems?
c. What is meant by context switch?
d. State the advantages of multiprocessor system.
e. What is the use of inter process communication?
f. What is Semaphores?
g. What do you understand by demand paging?
h. What is the basic function of paging?
i. When does thrashing occur?
j. What are device drivers?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. What is thrashing? Explain its advantages and disadvantages. Consider the following pages of a reference string: 1, 2, 0, 3, 5, 1, 5, 7, 2, 0, 3, 5, 4, 1, 2, 5, 3, 7
Implement FCFS, LRU and optimal page replacement algorithm and calculate the number of page fault and hit ratio by considering three frames in a block.

b. Discuss message-passing systems. Explain how message passing can be used to solve to buffer Producer/Consumer problem with infinite buffer.

c. Define deadlock. List four necessary conditions for occurrence of deadlock. A system contains 6 units of resource, and n processes that use the resource. What is the maximum value of n for which the system will be deadlock free if the maximum requirement of each process is 3?

d. Discuss various file allocation strategies for disk space management. What criteria should be used in deciding which strategies is best utilize for a particular file?

e. Write short notes on :
(i) I/O Buffering
(ii) Sequential file
(iii) Indexed file.

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SECTION C

3. Attempt any *one* part of the following: 10 x 1 =10

(a) What do you mean by thread? How it is different from process? Explain various thread models with their relative advantages and disadvantages.
(b) Consider a variant of Round-robin scheduling algorithm where the entries in the ready queue are pointers to the processes. What would be the effect of putting two pointers to the same process in the ready queue? What would be advantages and disadvantages of this scheme?

4. Attempt any *one* part of the following: 10 x 1 =10

(a) What do you understand by critical section? Write and explain Peterson solution to the critical section problem.

(b) How many page faults occur for optimal page replacement algorithm with following reference string for four page frames:

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2

5. Attempt any *two* parts of the following: 5 x 2 = 10

(a) Discuss the evolution of operating system.

(b) Explain inter process communication.

(c) Explain bankers algorithm with example.

6. Attempt any *one* part of the following: 10 x 1 =10

(a) Draw and explain the process state transition diagram
(b) What is scheduling? What criteria affect the scheduler performance? What are the different principles which must be considered while selection of scheduling algorithm?

7. Attempt any *two* parts of the following: 5 x 2 = 10

(a) What is the difference between preemptive and non-preemptive scheduling? Discuss the Multilevel Feedback Queue scheduling algorithm.

(b) Consider a logical address space of eight pages of 1024 words, each mapped onto a physical memory of 32 frames then :
(i) How many bits are in logical address?
(ii) How many bits are in physical address?

(c) Explain multiprocessing system and time sharing system with example.

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