DIPLOMA (COMPUTER SCIENCE)

00615

Term-End Examination

June, 2012

BICS-037 : OPERATING SYSTEM

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt* **any five** *questions. Question No. 1 is compulsory.*

1. Choose the correct one. **7x2=14**

(a) To avoid the race condition, the number of processes that may be simultaneously inside their critical section is :

(i) 8 (ii) 1 (iii) 16 (iv) 0

(b) Process is :

(i) A Program in high level language kept on disk

(ii) A contents of main memory

(iii) A program in execution

(iv) A Job in secondary memory

(c) The LRU algorithm is an :

(i) Out page that have been used recently

(ii) Out page that have not been used recently

(iii) Out page have been used least recently

(iv) Out the first page in a given area

(d) Thrashing :

(i) is a natural consequence of virtual memory system

(ii) can always be avoided by swapping

(iii) always occurs on large computers

(iv) can be caused by poor paging algorithm.

(e) A computer cannot boot if it does not have the :

(i) Compiler

(ii) Loader

(iii) Operating system

(iv) Assembler

(f) The FIFO algorithm executes first the Job

(i) that last entered the queue

(ii) that first entered the queue

(iii) that has been in the queue the longest

(iv) with the least processor needs.

(g) The principal of locality of reference justifies the use of :

(i) reenterable

(ii) non reusable

(iii) virtual memory

(iv) cache memory

2. (a) "Whether an operation system is essential for computer system " Justify. Write down the major differences between batch and time sharing operating system. 7

(b) What are the basic functions of an operating system ? How security and protection services are managed by an operating system ? 7

3. (a) What is threading ? What are the advantages of multithreading ? Explain different states of a process with the help of state transition diagram. 7

(b) Consider a system with a set of processes P_1, P_2 and P_3 and their CPU burst times, priorities and arrival times being mentioned as below- 7

Process	CPU burst time	Arrival time	Priority
P_1	5	0	2
P_2	15	1	3
P_3	10	2	1

Assuming 1 is the highest priority. Calculate average waiting time and turn around time using SJF and priority (Preemptive and non preemptive) scheduling mechanism.

4. (a) How process synchronization is implemented ? Explain bakery's algorithm. 7

(b) What are the semaphores ? Describe producer-consumer problem with its possible solution. 7

5. (a) What is deadlock ? List four necessary conditions for the occurence of deadlock and describe bankers algorithm. 7

(b) Consider a logical address space of eight pages of 1024 words, each mapped onto a physical memory of 32 frames then 7

(i) How many bits are in the logical address ?

(ii) How many bits are in the physical address?

6. (a) Compare and contrast paging and segmentation and also explain how protection is ensured in paging scheme ? 7

(b) What is virtual memory ? Describe its advantages with respect to user point of view and with respect to system point of view. 7

7. (a) Consider the following reference string 7
1, 1, 2, 2, 1, 4, 2, 3, 3, 5, 5, 4
find the number of page faults for above reference string assuming 200 words primary memory available to the program using LRU page replacement algorithm. Assuming two frames are available.

(b) Discuss any two disk scheduling-algorithm and list the advantage of SCAN over C-SCAN. 7

8. Attempt *any four* parts from following : **4x3½=14**

(a) Shell and AWK Programming

(b) File management

(c) Memory Partitioning and Allocation

(d) Symmetric multiprocessing and Microkernel

(e) Deadlock prevention and Avoidance

(f) Distributed and Real time operating system.
