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Paper Code & Roll No. to be filled in your Answer Book

Roll No. | | | | | | | | | | | |

MCA (II - Sem.)

Even Semester Examination - 2016

OPERATING SYSTEM

[Time : 3 Hours] **[Maximum Marks :100]**

Note: Attempt **all** questions :

Q1. Attempt **any four** parts: 5 x4=20

(a) What is the advantage of having different time quantum sizes on different levels of a multilevel queuing system?

(b) What is thread and how is it different from a process?

(c) Is it possible to have no deadlock even through there is a cycle in a resource allocation graph?

(d) What is the difference between hard real time and soft real time operating system?

(e) What is advantage of layered approach of designing an operating system?

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(f) What a feasible way to implement LRU page replacement algorithm

(g) What do you understand by program threats? Write two examples of program threat.

(h) What is role of request manager in LINUX?

(i) Assuming a cluster size of 512 bytes, calculate the percentage in file space due to incomplete filling of last clusters, for the file sizes

(i) 1200 bytes

(ii) 20000 bytes.

(j) What are monitors?

Q2. Attempt **any four** parts: 5 x 4=20

(a) Discuss the two models of inter-process communication highlighting their strengths and weaknesses.

(b) What is the difference between a trap and an interrupt? What is the use of each of these functions?

(c) Following is the snapshot of a CPU :

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Process	CPU Burst	Arrival Time
P1	10	0
P2	29	1
P3	3	2
P4	7	3

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS, Pre-emptiveSJF and RR Scheduling algorithms.

(d) What do you understand by short term, medium term and long term scheduling?

(e) What are the disadvantages of semaphores and discuss the suitable technique to overcome them?

(f) What is Bankers Algorithm? What is its use? Explain using suitable example.

10 x 2= 20

Q3. Attempt **any two** parts

(a) Suppose that a disk drive has 5000 cylinders, 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending request in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Calculate the total distance (in terms of cylinder), starting from

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its current head position, for the following scheduling algorithms.

(i) FCFS

(ii) SSTF

(iii) SCAN

(iv) C-SCAN

(v) LOOK

(b) In a paged segmented system, a virtual address consist of 32 bits of which 12 bits are a displacement, 11 bits are a segment number and 9 bits are a page number. Calculate

(i) Page size

(ii) Maximum segment size

(iii) Max number of pages

(iv) max number of segments\

(c) What is a access matrix? Why an operating system needs access matrix? What are the various techniques to implement it?

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Q4. Attempt **any two** parts 10 x 2=20

(a) Describe the memory management and file system of LINUX. What are various disk space allocation techniques? Write advantage and disadvantage of each.

(b) What is thrashing and how it occur? Discuss techniques that are used to overcome the thrashing.

(c) What is Semaphore? Write the code for Producer-Consumer problem using Semaphore

Q5. Attempt **any two** parts: 10 x 2=20

(a) What are various way in which deadlock can be handled and which way you will prefer to adopt and why?

(b) What is process scheduling? Explain the various functions performed by the process scheduler. What are the features which a typical process scheduling policy should contain?

(c) What are the various process states? Depict process state diagram. What do you understand by context switching and various process involved in it?

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