**Code : 061503**

**B.Tech 5th Semester Examination, 2016**

**Operating System**

*Time : 3 hours* *Full Marks : 70*

***Instructions :***

*(i) The marks are indicated in the right-hand margin.*

*(ii) There are Nine questions in this paper.*

*(iii) Attempt five questions in all.*

*(iii) **Question No. 1 is Compulsory.***

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1. Choose the correct answer for any seven of the following: 2×7=14

(A) A direct method of deadlock prevention is to prevent the occurrences of .....

(a) Mutual exclusion

(b) Hold and wait



(c) Circular waits

(d) No pre-emption

(B) ..... is the time required to move the disk arm to the required track

(a) Seek time

(b) Rotational delay

(c) Latency time

(d) Access time

(C) A process stack does not contain:

(a) function parameters

(b) local variables

(c) return addresses

(d) PID of child process

(D) A set of processes is deadlock if

(a) each process is blocked and will remain so forever

(b) each process is terminated

(c) all processes are trying to kill each other

(d) none of the mentioned

(E) When high priority task is indirectly pre-empted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called?

(a) Priority inversion

(b) Priority removal

(c) priority exchange

(d) priority modification

(F) Which module gives control of the CPU to the process selected by the short-term scheduler?

(a) dispatcher

(b) interrupt

(c) scheduler

(d) none of the mentioned

(G) The circular wait condition can be prevented by:

(a) defining a linear ordering of resource types



(b) using thread

(c) using pipes

(d) all of the mentioned

(H) Run time mapping from virtual to physical address is done by:

(a) memory management unit

(b) CPU

(c) PCI

(d) none of the mentioned

(I) Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced?

(a) First in first out algorithm

(b) additional reference bit algorithm

(c) least recently used algorithm

(d) counting based page replacement algorithm

(J) The heads of the magnetic disk are attached to a .... that moves all the heads as a unit.

(a) Spindle

(b) disk arm

(c) track

(d) None of these

2. (a) If FIFO page replacement algorithm is used with 4 page frames and 8 pages, how many page faults will occur with reference string 0124720347 if four page frames are initially empty ? Solve the same problem for LRU page replacement algorithm.

(b) Define a process. Explain the process state transition with a neat diagram. 7+7=14

3. (a) What is PCB? Discuss its major fields.

(b) Explain IPC Problem-Readers & Writers Problem? 7+7=14

4. (a) What is deadlock ? List the conditions that lead to deadlock. How deadlock can be prevented.

(b) Explain the use of Banker's algorithm for multiple resources for deadlock avoidance with illustration. 7+7=14



5. (a) Explain Linux kernel and its functions in brief.

(b) Define operating system. Explain the different views of operating system. Also explain types of operating system. 7+7=14

6. (a) What is Semaphore? How can we achieve the synchronization using semaphore for producer-consumer problem?

(b) Establish the necessity for memory management. Explain the memory management with the use of Linked Lists. 7+7=14

7. (a) Explain the classical thread model with its implementation strategies.

(b) Discuss the Peterson's solution for the race condition with algorithm. 7+7=14

8. (a) What is RAID ? Explain in brief.

(b) What is I-node ? Explain in detail. 7+7=14

9. (a) Explain the structure of a page table entry. If a machine has 48 bit virtual addresses and 32-bit physical addresses and pages are of 8 KB, how many entries are needed for the page table?

(b) Define and explain following terms:

(i) Authentication

(ii) Mutual Exclusion

(iii) Monitor

(iv) Segmentation.

7+7=14

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