

**PARUL UNIVERSITY**  
**FACULTY OF IT & COMPUTER SCIENCE**  
**BCA/IMCA Summer 2016 – 17 Examination**

**Semester: 4**  
**Subject Code: 05101252/05301252**  
**Subject Name: Operating System**

**Date: 01-06-2017**  
**Time: 10AM TO 1PM**  
**Total Marks: 60**

**Instructions:**

1. Attempt all questions from each section.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Write section-A, section-B on separate answer sheets.

**SECTION-A**

**Q.1 Answer the following MCQ (Attempt any 10 from 12)**

**(10)**

- (1) 'Process' is :
  - (a) a program under execution, which competes for the monitor & other resources
  - (b) a process under execution, which competes for the monitor, RAM & ROM
  - (c) An information conversion which competes for hard disk raw data
  - (d) A program under execution, which competes for the CPU time and other resources
- (2) When a process is waiting for an external event such as an I/O operation, the process is said to be in a \_\_\_\_\_ state.
  - (a) Continuous
  - (b) Dead lock
  - (c) Paging
  - (d) Blocked
- (3) Choose the Odd one out in the context of CPU utilization time.
  - (a) Real time
  - (b) Turnaround time
  - (c) Waiting time
  - (d) Response time
- (4) Which of the following is NOT used short term scheduling policy belonging to both preemptive and non-preemptive philosophies ?
  - (a) Round Robin
  - (b) Process based
  - (c) Priority based
  - (d) Heuristic
- (5) On declaring static partitions, the operating system creates a \_\_\_\_\_ for future use.
  - (a) Pointer Description Table
  - (b) Floating Point Table
  - (c) Partition Description Table
  - (d) Partition Information Table
- (6) In a machine whose address bus is 16 bit wide, if the page size of that machine is 2048 words than maximum size of Page Map Table is \_\_\_\_\_ words.
  - (a) 2048
  - (b) 1024
  - (c) 32
  - (d) 16

- (7) In Linux, '/proc' is
- General directory
  - Optional files directory
  - Shared program files
  - Not a real directory
- (8) Which of the following is NOT the shell in Linux ?
- csh
  - Bash
  - ksh
  - tcsh
- (9) Which one of the following is the deadlock avoidance algorithm?
- banker's algorithm
  - round-robin algorithm
  - elevator algorithm
  - karn's algorithm
- (10) The two atomic operations permissible on semaphores are : (choose two)
- wait
  - stop
  - hold
  - signal
- (11) To mount a Linux-format disk on hdb2 (home), and place it in /mnt, the correct command is
- mount -t ext2 /dev/hdb1 /mnt
  - mount -t ext2 /dev/hdb2 /mnt
  - mount -w ext2 /dev/hdb2 /mnt
  - mount -r ext2 /dev/hdb2 /mnt
- (12) Choose the odd one out from the following
- chmod u+r
  - chmod g-x
  - chmod o+rx-w
  - chmod o-gx+t

## Q.2

**(a) Answer the following Questions (1 line Answer) (Attempt any 5 from 7) (05)**

- Which are the basic process states that the operating system defines in order to manage switching between processes ?
- Define the term Turnaround time.
- Parul University wanted to implement Virtual memory management system. List out two popular methods through which it can be done.
- In Fixed Block Architecture (FBA), what is the use of data CRC ?
- Which are two methods of implementing non-contiguous memory allocations ?
- List out the four common root level directories found on all Linux systems.
- In Linux, which files contain configuration for Printers & Parallel printer port ?

**(b) Answer the following questions (Short) (Attempt any 2 from 4) (05)**

- Briefly explain Multitasking & Multithreading.
- Briefly explain algorithms FIFO (First In First Out) & NRU (Not Recently Used) in the context of Page Replacement Policies.
- What is Thrashing ? How does it occur ?
- Briefly explain basic file handling commands in Linux.

**OR**

**(b) Answer the following questions (Attempt any 2 from 4) (05)**

- (1) What is Shell in Linux ? Give examples.
- (2) Explain the term “Superuser” in Linux.
- (3) Explain Non-preemptive and Preemptive scheduling philosophies.
- (4) Explain the term “Swapping” in partitioned memory management

**Q.3 Answer the following questions (Attempt any 2 from 3) (10)**

- (1) Dr. A. Shah, General Manager of US-based MNC, is in great dilemma due to conflict of various objectives in operating systems. In light of above, discuss the basic objectives to be achieved before designing an operating system.
- (2) In Linux each file is owned by a user, normally the user who created it. In this context, explain with suitable examples various ways of file access permissions.
- (3) Write a short note on “vi editor”.

**OR**

**Q.3 Answer the following questions ( Long) (Attempt any 2 from 3) (10)**

- (1) Discuss the various functions performed by Memory Management module in operating system.
- (2) Write a short note on Direct Memory Access (DMA).
- (3) Management of process is a very vital part especially when operating system supports multiple users. In this context overview the term “process management”.

**SECTION-B**

**Q.1 Answer the following short questions (Attempt any 5 from 7) (10)**

- (1) Define the terms : (a) Free software (b) Kernel of the operating system
- (2) What is the difference between “CMP” and “DIFF” command in Linux ?
- (3) What is the use of “chmod” command in Linux ?
- (4) What is the meaning of “swapped out but ready” state in Process Control Block ?
- (5) In I/O bound process, what we need to do to increase throughput ?
- (6) In one operating system for instance, for 200 instructions, it might take only 0.0002 seconds, the entire operation assume completion time 0.0015 seconds as an average than what will be the CPU Utilization ?
- (7) How memory management methods can be judged in terms of efficiency ?

**Q.2**

**(a) Attempt the following Questions (1 line Answer) (Attempt any 5 from 7) (05)**

- (1) In Single Contiguous Memory , how protection can be achieved ?
- (2) Which are the strategies in partition allocation ?
- (3) How operating system maintain the processes waiting to be loaded in the memory ?
- (4) How dynamic relocation is used ?
- (5) In 1991, Who had developed Linux for the first time ?
- (6) Which partition is automatically mounted when Linux boots ?
- (7) How in Direct Memory Access (DMA) address bus is connected ?

**(b) Answer the following questions (Short) (Attempt any 2 from 4) (05)**

- (1) Define the terms : (a) Rotational Delay (b) Transmission time
- (2) How the Least Recently Used (LRU) algorithm is implemented ?
- (3) How the Page Map Table (PMT) is implemented ?
- (4) In Linux, What does “cat”, “pwd”, “cp”, “echo” commands do ?

**OR**

**(b) Answer the following questions (Short) (Attempt any 2 from 4) (05)**

- (1) How is the context switching done ?
- (2) List out the first four fields within a Process Control Block (PCB).
- (3) How with the help of Limit Register we can protect the process by mistake or on purpose become capable of interfering with other process ?

(4) How we can create groups and add users in the group in Linux ?

**Q.3 Answer the following questions ( Long) (Attempt any 2 from 3)**

**(10)**

- (1) Explain in details the term “Paging”.
- (2) Discuss “Locality of Reference” -the basic principle behind virtual memory.
- (3) Write a short note on the “fstab” File.

**OR**

**Q.3 Answer the following questions ( Long) (Attempt any 2 from 3)**

**(10)**

- (1) List the first five steps that will be followed when a running process encounters an I/O instruction.
- (2) Discuss the term “Fixed Partitioned Memory”
- (3) Briefly explain the features of Linux.