

**KADI SARVA VISHWAVIDHYALAYA****CE/IT SEMESTER-V EXAMINATION (NOV- 2016)****SUBJECT CODE: CE/IT-503****SUBJECT NAME: Operating System****DATE: 15/11/2016****TIME: 10:30 to 12:30****TOTAL MARKS: 70****Instructions:**

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

**SECTION-1**

**Q.1 (a)** Define Operating Systems. List different types of Operating Systems. Explain any one in detail. [5]

**(b)** Explain services provided by operating systems. [5]

**(c)** What is process? Explain the different states of process. [5]

**OR**

**(c)** Explain following scheduling algorithms: [5]

i) Round Robin

ii) Priority Scheduling.

**Q.2 (a)** Difference between Monolithic kernel & Microkernel. [5]

**(b)** Explain types of threads. [5]

**OR**

**Q.2 (a)** What is the average waiting time and average turn around times of processes for FCFS, Non-preemptive priority and Round Robin (Quantum=1) scheduling: [5]  
(Note: Assume all processes have arrived at time 0.)

Process	Burst time	Priority
P1	8	5
P2	1	1
P3	3	2
P4	2	4
P5	5	3

**(b)** Define Process Control Block with diagram. [5]

- Q.3** (a) Discuss the Peterson's solution for the race condition with algorithm. [5]  
 (b) Write short note: Semaphores [5]
- OR**
- Q.3** (a) Explain the IPC Problem known as Dining Philosopher Problem. [5]  
 (b) Write short note: Monitors [5]

## SECTION-2

- Q.4** (a) What is Deadlock? List the conditions that lead to deadlock. [5]  
 (b) Explain Resource Allocation Graph with diagram. [5]  
 (c) Explain the use of Banker's Algorithm for multiple resources for Deadlock Avoidance with illustration. [5]
- OR**
- (c) Explain various Page replacement algorithms with examples. [5]
- Q.5** (a) Explain following allocation algorithms: [5]  
 i) First fit  
 ii) Best fit  
 iii) Worst fit
- (b) Difference between: [5]  
 i) Contiguous and Non-contiguous Memory Allocation  
 ii) Internal and External Fragmentation
- OR**
- Q.5** (a) Explain the following UNIX commands [5]  
 (i) grep (ii) cut (iii) chmod (iv) finger
- (b) For the following page reference string: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 Calculate the page faults applying the following Page Replacement Algorithms for a memory with three frames: (i) Optimal (ii) LRU (iii) FIFO [5]
- Q.6** (a) Explain of DMA data transfer with block diagram [5]  
 (b) Write short note: RAID levels [5]
- OR**
- Q.6** (a) Explain the concept of Virtual machines in operating system. [5]  
 (b) Write short note on Real Time Operating System with example. [5]

\*\*\*\*\*BEST OF LUCK\*\*\*\*\*

# KADI SARVA VISHWAVIDYALAYA

B.E SEMESTER V EXAMINATION (NOVEMBER 2015)

SUBJECT CODE: CE/IT 503

SUBJECT NAME: OPERATING SYSTEM

DATE: 23/11/2015

TIME: 10.30 a.m.to 1.30 p.m.

TOTAL MARKS: 70

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#### Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

## Section-1

Q:1 (All Compulsory)

- (A) What is an Operating System? Explain the abstract view of the components of a computer system. 05
- (B) List the types of Operating system? Explain any two in detail. 05
- (C) What is PCB? Discuss its major fields. 05
- OR
- (C) What is thread? Explain thread structure. 05

Q:2 Answer the following Question.

- (A) Write shell script for the following: 05
- (i) To delete zero sized files from a given directory.  
(ii) To display the name of all executable files in the given directory.
- (B) Explain Readers and writers problem with solution. 05
- OR
- (A) What is critical section? What is Mutual exclusion? Explain Peterson's solution for mutual exclusion problem. 05
- (B) Give the functions of following UNIX commands: grep, cat, chmod, pipe, pwd 05

Q:3 Answer the following Question.

- (A) Explain the Banker's algorithm for deadlock avoidance. 05
- (B) Five jobs A through E arrive at a computer center with following details 05

Job	Arrival Time	CPU Time
A	0	9
B	1	5
C	2	2
D	3	6
E	4	8

Calculate the Turnaround Time and Waiting Time for all processes applying (i) First Come First Serve (ii) Shortest Job First and (iii) Round Robin (with Time Quantum=3)

OR

- (A) What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented? 05

(B) Here is a table of processes and their associated arrival and running times.

05

Process ID	Arrival Time	Expected CPU Running Time
Process 1	0	4
Process 2	2	5
Process 3	3	3
Process 4	8	4

Calculate the Turnaround Time and Waiting Time for all processes applying (i) First Come First Serve (ii) Shortest Job First and (iii) Round Robin (with Time Quantum=1)

## Section-2

Q:4 (All Compulsory)

(A) Explain Multiprogramming with Fixed Partitions and Multiprogramming with Variable Partitions.

05

(B) Compare Paging with segmentation.

05

(C) For the Page Reference String:

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1.

Calculate the Page Faults applying (i) Optimal (ii) LRU and (iii) FIFO Page Replacement Algorithms for a Memory with three frames.

OR

(C) What is fragmentation? What is the need of fragmentation? Explain the difference between internal and external fragmentation.

05

Q:5 Answer the following Question.

(A) Given memory partition of 100K, 500K, 200K, 300K, and 600K in order, how would each of the First-fit, Best-fit and Worst-fit algorithms place the processes of 212K, 417K, 112K and 426K in order? Which algorithm makes the most efficient use of memory? Show the diagram of memory status in each case.

05

(B) Define: Waiting Time, Response Time, starvation, busy waiting and daemon.

05

OR

(A) What is Virtual Memory? Explain Demand Paging.

05

(B) What is co-operating process? Explain advantages of Cooperating process.

05

Q:6 Answer the following Question.

(A) Given a disk unit with 200 tracks, numbered from 0 to 199. At time 0 there is a queue of read requests, the head is positioned over track 89 and "moving towards" the lower tracks. The disk queue of pending requests is (given in order of arrival) 2, 156, 78, 192, 19, 127, 90, 100 Two further requests on track numbers 140 and 60 arrive when servicing the request for track number 127. Starting from the current head position of 89 for FCFS, SSTF and SCAN disk scheduling algorithms: (i) Draw a diagram showing the disk head movements. (ii) Total distance (in tracks) that the disk head moves to satisfy all the 10 requests. (iii) The average number of tracks.

05

(B) What is Virtualization? Explain the types of Virtualization.

05

OR

(A) Draw the block diagram for DMA. Explain the steps for DMA data transfer.

05

(B) Explain the features of Real Time Operating System.

05

-----All The Best-----

# KADI SARVA VISHVA VIDHYALAYA

B.E. (C.E./I.T.) SEMESTER-V EXAMINATION (NOVEMBER/2014)

SUBJECT CODE: CE/IT 503 SUBJECT NAME: OPERATING SYSTEM

DATE: 18/11/2014

TIME: 10:30 TO 1:30

TOTAL MARKS: 70

## Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

## SECTION-1

Q:1

- (A) What is an operating system? Explain the types of operating system. [5]  
(B) Explain system call and types of system calls in detail. [5]  
(C) Define a process. Explain the process state transition with a neat diagram. [5]

OR

- (C) Write a short note on (i). Semaphore (ii). Monitors [5]

Q:2

- (A) What do you mean by Deadlock Avoidance? Explain the use of Banker's Algorithm for Deadlock Avoidance with illustration. [5]  
(B) Explain the following allocation algorithms.  
(i) First-fit  
(ii) Best-fit  
(iii) Worst-fit [5]

OR

- (A) Explain recovery from Deadlock? [5]  
(B) Draw the block diagram for DMA? Explain the steps for DMA data transfer. [5]

Q:3

- (A) Discuss the Peterson's solution for race condition with algorithm. [5]  
(B) Consider the following table: [5]

Process	Burst time	Arrival time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

Calculate average turnaround time and average waiting time for the FCFS scheduling algorithm, and SJF (pre-emptive and non pre-emptive scheduling both) scheduling algorithm.

**OR**

- (A) Explain memory swapping in detail. [5]  
(B) Explain paging in detail. [5]

## **SECTION-2**

**Q:4**

- (A) For the page reference string: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0. 1. 7, 0, 1.  
Calculate the page faults applying (i) Optimal (ii) LRU and (iii) FIFO page Replacement Algorithms for a memory with 3 frames. [5]
- (B) Explain Device Independent I/O software. [5]
- (C) Write a short note on RAID level system. [5]

**OR**

- (C) Explain IPC Problem –Dining Philosopher Problem. [5]

**Q:5**

- (A) Explain any Three Disk Arm Scheduling Algorithms with illustration. [5]  
(B) Explain in Brief: Bounded-Buffer Problem. [5]

**OR**

- (A) What is thread and what are the differences between user-level threads and kernel supported threads? Under what circumstances is one type “better” than the other? [5]
- (B) Explain the following in brief. (i) Multiprogramming with Fixed Partitions and Multiprogramming with Variable Partitions. [5]

**Q:6**

- (A) Explain in Brief: Real Time Operating System. [5]  
(B) Find average waiting time for Shortest job first scheduling, and Round robin Scheduling algorithm. [5]

PROCESS	CPU BURST TIME
P1	6
P2	8
P3	5
P4	2

CPU burst time is given in millisecond and time quantum is 4.

**OR**

- (A) Define distributed system. Explain the characteristics of distributed system. [5]  
(B) How Resource Trajectories can be helpful in avoiding the deadlock? [5]

-----ALL THE BEST-----

# KADI SARVA VISHVA VIDHYALAYA

B.E. (C.E./I.T.) SEMESTER-V (ATKT) THEORY EXAMINATION (APRIL/2015 )

SUBJECT CODE: CE/IT 503 SUBJECT NAME: OPERATING SYSTEM

DATE: 22/04/2015

TIME: 10:30 TO 1:30

TOTAL MARKS:70

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## Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

## SECTION-1

Q:1

- (A) Explain system call and types of system calls in detail. [5]  
(B) Explain following terms in detail. Multiprogramming, Multiprocessing, Timesharing. [5]  
(C) Define a process. Explain the process state transition with a neat diagram. [5]

OR

- (C) What is an operating system? Explain the types of operating system. [5]

Q:2

- (A) What do you mean by Deadlock? Explain necessary condition for Deadlock. [5]  
(B) List down types of scheduler and explain each of them in detail. [5]

OR

- (A) Explain resource trajectories in detail. [5]  
(B) Draw the block diagram for DMA? Explain the steps for DMA data transfer. [5]

Q:3

- (A) Consider the following set of processes with the length of the CPU burst time given in milliseconds. Draw the gantt chart illustrating the execution of these processes using FCFS, SJF(Pre-emptive, Non Pre-emptive), Priority (Pre-emptive, Non Pre-emptive) scheduling. Calculate turn-around time and waiting time for each process for all 5 scheduling algorithms. [5]

Process	Arrival Time	Burst time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

- (B) Explain producer- consumer problem using sleep and wake up call. [5]

OR

(A) Explain concept of memory management with Bitmap and Linked List. [5]

(B) Explain Fragmentation in memory management in detail. [5]

## **SECTION-2**

**Q:4**

(A) Write a short note on **RAID** level system. [5]

(B) Explain IPC Problem –Readers-Writers Problem. [5]

(C) Explain in Brief: Bounded-Buffer Problem. [5]

**OR**

(C) What is Paging? What is Page Table? Explain the conversion of Virtual Address to Physical Address in Paging with example [5]

**Q:5**

(A) Explain in Brief: Real Time Operating System. [5]

(B) Explain Goals of I/O software. [5]

**OR**

(A) Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following replacement algorithms, assuming four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each. LRU replacement, FIFO replacement. [5]

(B) Explain the following in brief. [5]

- (i) Multiprogramming with Fixed Partitions and
- (ii) Multiprogramming with Variable Partitions.

**Q:6**

(A) Explain any Three Disk Arm Scheduling Algorithms with illustration. [5]

(B) Find average waiting time for Shortest job first scheduling, and Round robin Scheduling algorithm. [5]

PROCESS	CPU BURST TIME
P1	10
P2	4
P3	8
P4	8

CPU burst time is given in millisecond and time quantum is 3.

**OR**

(A) Define distributed system. Explain the characteristics of distributed system. [5]

(B) Explain In Brief. Para virtualization. [5]

-----ALL THE BEST-----