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*Bankers
Algonia*

B.Tech. Examination, 2017

(Fifth Semester)

(C.S. & I.T. Branch)

Paper - III

OPERATING SYSTEM

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

Q. 1. (a) What is multiprocessing operating system.

Differentiate SMP and AMP.

10

(b) Justify the statement that operating system is a resource allocator with the help of example.

10

(2)

Q. 2. (a) Define various types of queues with the help of queuing diagram. **10**

(b) Differentiate between real time & time sharing operating system. **10**

Q. 3: (a) What is the need of page replacement ? How many page fault occurs in FIFO and LRU for the reference string 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 7, 8, 9, 5, 4, 5, 4, 2 with four page frames. **10**

(b) Discuss the various states of processes with process state diagram. **10**

Q. 4. (a) Explain RAID structure. Discuss the various RAID levels in disk scheduling. **10**

(3)

- (b) Find out the head movement in disk drive of 100 cylinder for SSTF, C-LOOK and C-SCAN for devices queue consists of requests in FIFO. Order is 5, 10, 50, 20, 60, 80, 70 and 90. If the last served request was 75 and current head at cylinder at 40. 10

Q. 5.. (a) What is trashing ? Explain the cause of trashing. Discuss the various ways to prevent trashing. 10

(b) What is semaphore ? Explain its usage in Dining-Philosopher's problem. 10

Q. 6.. (a) Consider the following snapshot at time T_0 of the system and answer the following questions using Banker's algorithm. 10

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390 (4)
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(i) Compute the total number of resources of each type.

(ii) Compute the need matrix.

(iii) Is the system in a safe state ?

	Allocation	Max	Available
	ABCD	ABCD	ABCD
P ₀	0012	0012	1520
P ₁	1000	1750	
P ₂	1354	2356	
P ₃	0632	0652	1520
P ₄	0014	0656	

(b) Explain safe state and give safe state

algorithm.

10

(5)

Q.7.. (a) What do you understand by race-condition ?

Give few examples of arising of race-condition
in concurrent processing. 10

(b) Consider the set of process given in the table
and draw the Gantt chart for primitive cases
and find out average waiting time and average
turn around time for following scheduling algo.

Use
(Note : Larger priority has higher priority). 10

Process	Arrival Time	Execution Time	Priority
P_0	0	5	4
P_1	2	4	2
P_2	2	2	6
P_3	4	4	3

Do it with Round Robin and Priority scheduling.

(6)

Q. 8. • Write short notes on (any four) :

4×5=20

- (a) Paggging**
 - (b) Fregmentation**
 - (c) Segmentation**
 - (d) Demand Paggging**
 - (e) Resource allocation graph**
 - (f) PCB ✓**
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B.Tech. Examination, 2016

(Fifth Semester)

(C.S. & I.T. Branch)

Paper - III

OPERATING SYSTEM

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

- Q. 1.** (a) Explain the role of operating system as a resource manager.
(b) Discuss the OS organization and what are the factors in OS design ?
- Q. 2.** (a) Discuss one of the classical problems related to the process synchronization.
(b) State the finite buffer Producer-Consumer Problem. Give solution of the problem using semaphores.
- Q. 3.** (a) Differentiate between
(i) Multiprocessor scheduling and uni processor scheduling.
(ii) Pre-emptive and Non pre-emptive scheduling.

(2)

- (b) Draw the process state diagram and explain the state diagram.

Q. 4. (a) Differentiate between :

Deadlock prevention and avoidance.

- (b) What are deadlocks ? How they are avoided ?

Q. 5. (a) Explain the difference between internal fragmentation and external fragmentation ? Which one occurs in paging system ? Discuss various ways of removing fragmentation.

- (b) What is contiguous memory allocation ? List the advantages and disadvantages of continuous memory allocation.

Q. 6. (a) What do you understand by page replacement ? Name the algorithm available for page replacement.

- (b) Write down the criteria for selection of disk-scheduling algorithm.

Q. 7. Write short notes on any four of the following :

- (a) Real Time System
- (b) PCB
- (c) Bare Machine
- (d) RAID
- (e) I/o Buffering

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B. Tech. Examination, 2015
(Fifth Semester)
(C.S. & I.T. Branch)

Paper-III

OPERATING SYSTEM

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

Q. 1. (a) Define operating system. Explain the essential properties of multiprogramming and multiprocessor operating system.

(b) Explain operating system services. ✓

Q. 2. (a) What resources are used when a thread is created? How do they differ from those used when a process is created? ✓

(b) Explain critical section problem. ✓

Q. 3. (a) Consider the following set of processes :

Process Arrival Time Burst Time

A	0	1
B	1	2
C	2	1
D	3	2

Calculate the average waiting time using Round Robin Algorithm (time quantum of RR = 1 ms)

(b) Explain thrashing.

Q. 4. (a) What is a deadlock ? What are the four necessary condition to deadlock to occur ?

OR

Explain Paging with segmentation.

Q. 5. (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 replacement algorithms, assuming four frames, using LRU, FIFO and optimal replacement algorithm.

(b) Explain Process states.

Q. 6. (a) What is a semaphore ? Explain its usage in reader-writer's problem.

(b) What do you understand by a file directory ? Discuss the objectives for a file management system.

Q. 7. (a) Write short notes on any four :

- (a) Fragmentation
- (b) Operating system structure
- (c) File Allocation methods
- (d) Banker's Algorithm
- (e) Virtual memory concepts.

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B.Tech. Examination, 2014

(Fifth Semester)

(C.S. & I.T. Branch)

Paper : III

OPERATING SYSTEM

Time Allowed : Three Hours

Maximum Marks : 100

Note : Do any five. All questions carry equal marks.

- Q. 1.** What is operating system ? Define the essential properties of following types of operating systems. **20**
- (a) Batch
 - (b) Time sharing
 - (c) Real time
- Q. 2.** What do you mean by process ? Also explain process states & process control block with the help of neat & clean diagram. **20**
- Q. 3.** What do you mean by CPU scheduling ? Define the difference b/w preemptive & non-preemptive scheduling. Consider the following set of processes. **20**

(2)

Process	Arrival time	Burst time
P ₁	0.0	8
P ₂	0.4	4
P ₃	1.0	1

- (a) Draw Gantt chart for FCFS & SJF scheduling.
(b) Calculate average turn around time for SJF & FCFS scheduling.
- ✓ Q. 4. What is dead lock explain the deadlock handling ?
Also explain the Banker's Algorithm for deadlock avoidance ? 20
- Q. 5. Explain the following allocation algorithms. 20
(a) First – fit
(b) Best – fit
(c) Worst – fit
- Q. 6. When do page faults occur ? Describe the actions taken by operating system when a page fault occurs. Consider the following page reference string. 20
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6
How many page faults occur with LRU page replacement algo.
- Q. 7. Write short notes on any four. 5×4=20
(a) Inter process communication
(b) Threads
(c) Semaphores
(d) RAID
(e) Context switch