

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 110409

Roll No.

B.TECH.

Theory Examination (Semester-IV) 2015-16

OPERATING SYSTEM

Time : 3 Hours

Max. Marks : 100

Note: Attempt questions for all Sections as per directions.

Section-A

Attempt all parts of this section. Answer in brief.

(2×10 = 20)

1.
 - (a) What is SPOOLING?
 - (b) Write a brief note on multiprocessor scheduling.
 - (c) What is the need for Process Control Block (PCB)?
 - (d) Define Multithreading.
 - (e) Differentiate concurrent execution and parallel execution.
 - (f) What do you understand by critical section?
 - (g) How is a system call handled by the system?

- (h) Draw process state transition diagram.
- (i) What do you mean by Kernel?
- (j) Define the multilevel feedback queues scheduling.

Section-B

2. Attempt any five questions from this section.

(5×10 = 50)

- (a) State the cause of thrashing and discuss its solution.
- (b) What are the different techniques to remove fragmentation in case of multiprogramming with fixed partitions and variable partitions?
- (c) Discuss the performance criteria for CPU Scheduling.
- (d) Consider the following reference string 12342156212376321236. How many page faults will occur for:

(i) FIFO

(ii) LRU Page Replacement algorithm?

Assuming three and four frames in each case and frames are initially empty.

- (e) Give the solution of Readers - Writers problem by using the concept of Semaphore.?

(2)

P.T.O.

- (f) Explain the following methods.
- (i) Bit vector (ii) Linked List
- (iii) Grouping (iv) Counting
- (g) Consider the processes, CPU burst time and Arrival time given below:

Processes	CPU burst time	Arrival time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

Draw the Gantt chart and calculate the following by using SRTF CPU Scheduling Algorithm, (i) Average Waiting Time, (ii) Average Turn Around time.

- (h) Consider the following snapshot of the system:-

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm:-

- (i) What is the content of the matrix **Need**?
- (ii) Is the system in a **safe state**? If yes then find the **Safe sequence**.
- (iii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?

Section-C

Attempt any two questions from this section. (2×15 = 30)

- 3. What is directory? Explain any two ways to implement the directory.
- 4. Suppose the moving head disk with 200 tracks is currently serving a request for track 143 and has just finished a request for track 125. If the queue of request is kept in FIFO order 86, 147, 91, 177, 94, 150. What is total head movement for the following scheduling:
 - (i) FCFS
 - (ii) SSTF
 - (iii) C-SCAN
- 5. Write short notes on:
 - (i) I/O Buffering
 - (ii) Sequential File
 - (iii) Indexed File