

(Please write your Exam Roll No.)

Exam Roll No.

END TERM EXAMINATION

FIFTH SEMESTER [B.TECH/M.TECH] DECEMBER 2016 – JANUARY 2017

Paper Code: IT-317

Subject: Operating Systems

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any five questions including Q.no.1 which is compulsory.

- Q1 (a) Define batch operating system. (6x2=12)
(b) What are the main functions of an Operating System?
(c) Define the term PCB.
(d) Discuss different types of semaphore.
(e) Explain the concept of disk scheduling.
(f) What is thrashing? When it occur?
- Q2 (a) What are the different states of a process? Explain with the help of diagram. Also explain the concept of process scheduling with queuing. (6)
(b) What is pre-emptive and non-emptive scheduling? List the CPU scheduling algorithms that support pre-emptive or non-pre-emptive nature of process. Explain any one CPU scheduling algorithm. (6)
- Q3 (a) Explain critical section problem. Give Dining Philosopher problem solution using semaphore. (6)
(b) Explain the concept of deadlock. What are the necessary conditions for deadlock occurrence? Discuss with the help of an example. (6)
- Q4 (a) Explain the term paging in memory management and also discuss which type of fragmentation occurs in paging and how it can be resolved. (6)
(b) What is contiguous allocation? List all contiguous allocation schemes. Consider five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order). There are 4 processes of size 212 KB, 417 KB, 112 KB and 426 KB. How would each of the contiguous allocation scheme place the processes in memory? (6)
- Q5 (a) Explain the concept of a file and file operations. What are the different access methods in file system? (6)
(b) What are the different page replacement algorithms? Which algorithm suffers from Belady's anomaly and why. Explain with a suitable example. (6)
- Q6 What are disk scheduling algorithms? Why these algorithms are not implemented in hardware, instead of Operating System Implementation? Suppose there are 200 cylinders numbered 0-199. The disk head starts at 100. Calculate the total head motion needed to satisfy the given request: 23, 89, 132, 42 and 187 for the following disk scheduling algorithms FCFS, SSTF, SCAN, LOOK. (12)
- Q7 (a) Consider the following set of processes, with the length of the CPU burst and arrival time given in milliseconds. (6)

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Process	Arrival Time	Burst Time
P1	0	10
P2	3	2
P3	4	5
P4	6	8
P5	7	1

Calculate turn-around time for each process using SRTF and FCFS.
Explain which scheduling algorithm suffers from starvation.

(b) Consider the page reference string:

2, 4, 1, 3, 2, 5, 6, 1, 2, 0, 3, 4

Assume memory with 3 frames. Calculate number of page faults using
LRU, optimal page replacement. (6)

Q8 Write short notes on the following: (4x3=12)

- (a) Kernel
- (b) Virtual memory
- (c) Segmentation
- (d) Distributed System
