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Total Number of Pages: 02

MCA  
MCC302

**3<sup>rd</sup> Semester Regular / Back Examination 2016-17**

**OPERATING SYSTEMS**

**BRANCH: MCA**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: Y556**

**Answer Question No.1 which is compulsory and any five from the rest.  
The figures in the right hand margin indicate marks.**

**Q1** Answer the following questions: **(2 x 10)**

- a) Define System Calls.
- b) What is the cause of thrashing?
- c) Mention the importance of swap space management.
- d) Differentiate between internal and external fragmentation
- e) What is the difference between starvation and deadlock?
- f) Describe different allocation strategies for files.
- g) List the three requirements that must be satisfied by critical section problem.
- h) What do you mean by spooling?
- i) What is compaction? What are its overheads?
- j) Differentiate between process and program.

**Q2** State the condition that leads to deadlock and consider the following system : **(2+8)**

Allocation	Max			Available					
	A	B	C	A	B	C			
P0	1	0	2	4	1	2	2	2	0
P1	0	3	1	1	5	1			
P2	1	0	2	1	2	3			

Is the system in a safe state? If so, what is the safe sequence?

**Q3 a)** What is the Peterson's solution to the critical section problem? Draw the structure of processes in Peterson's solution. **(5)**

**b)** Give an example of the 3 resource deadlock involving three resources and three processes. Draw the appropriate resource allocation graph. **(5)**

**Q4 a)** Suppose a disk drive has 300 cylinders numbered 0 to 299. The current head position of the disk is at 90. The queue of pending requests in FIFO order is 36,79,15,120,199,270,89,170. Calculate the average cylinder movements for Shortest Seek Time First (SSTF) algorithm. Mention any one disadvantage of SSTF. **(5)**

**b)** Explain the worst fit algorithm for memory management. What are its benefits? **(5)**

**Q5 a)** Consider the following page reference string and a memory consisting of 4 frames: 1,2,3,4,5,6,1,2,3,4,5,6 **(5)**

Find the number of page faults considering

FIFO page replacement strategy

LRU page replacement strategy

Comments on the result obtained.

**b)** Why are page sizes is always a power of 2? What is the difference between the logical and physical address? **(5)**

**Q6 a)** Consider the following set of processes. CPU burst time for them is given in milliseconds. **(5)**

Process	Burst time (ms)
P1	15
P2	5
P3	7
P4	10

Draw the gnatt chart for round robin scheduling where the quantum  $q=4$  milliseconds. Calculate the average waiting time and turnaround time.

**b)** Explain the reader-writer problem using semaphore. **(5)**

**Q7** What is Translation Look-aside Buffer (TLBs)? Why it is important in simple paging system? What information is stored in typical TLB table entry? Explain. **(10)**

**Q8** Write short notes on any TWO: **(5 x 2)**

**a)** Belady's Anomaly

**b)** Kernel Level Thread

**c)** RAID structure

**d)** Inter Process Communication mechanism