Roll No. DTU/2015/CO/049

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B.Tech.(CO)
(March – 2017)

4TH SEMESTER
MID SEMESTER EXAMINATION

CO 204: Operating System Design

Time: 1:30 Hours **Max. Marks: 30**

Note: Answer all questions.
Assume suitable missing data, if any.

Q 1. Given a total of 10 units of a resource type, and given the safe state shown below, should process 2 be granted a request of 2 additional resources? Is the system in unsafe state, and if so explain.

Process	Used	Max Need
P1	2	5
P2	1	6
P3	2	6
P4	1	2
P5	1	4

(2)

Q 2. A system has five processes P1 through P5 and four resource types R1 through R4. There are 2 units of each resource type. Given that:
P1 holds 1 unit of R1 and requests 1 unit of R4
P2 holds 1 unit of R3 and requests 1 unit of R2
P3 holds one unit of R2 and requests 1 unit of R3
P4 requests 1 unit of R4
P5 holds one unit of R3 and 1 unit of R2, and requests 1 unit of R3
Show the resource graph for this state of the system. Is the system in deadlock, and if so, which processes are involved? (3)

Q 3. List the four conditions that raise a deadlock. (2)

Q 4. What scheduling policy will you use for each of the following cases? Explain your reasons for choosing them.
(a) The processes arrive at large time intervals: Round
(b) The system's efficiency is measured by the percentage of jobs completed. SJF
(c) All the processes take almost equal amounts of time to complete. FCFS (3)

P.T.O.

Q 5. Discuss on problem synchronization. Illustrate any two classical problems of synchronization. (5)

Q 6. Describe the differences among short-term, medium-term and long-term scheduling. (5)

Q 7. We wish to schedule three processes P1, P2 and P3 on a uniprocessor system. The priorities, CPU time requirements and arrival times of the processes are as shown below.

Process	Priority	CPU time required	Arrival time (hh:mm:ss)
P1	10(highest)	20 sec	00:00:05
P2	9	10 sec	00:00:03
P3	8 (lowest)	15 sec	00:00:00