Week 5 : Assignment 5

The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

As per our records you have not submitted this assignment.

1) Which one of the following statement about the period transformation technique is true? 1 point

a. It is used for assign priority to some tasks with very long periods have very high criticality and to perform schedulability analysis in this situation
b. It is used for assign priority to some tasks with very short periods have very high criticality and to perform schedulability analysis in this situation
c. It essentially enables scheduling sporadic tasks by a rate monotonic scheduler by logically transforming those tasks into periodic tasks
d. It essentially enables scheduling aperiodic tasks by a rate monotonic scheduler by logically transforming those tasks into periodic tasks

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

2) Which one of the following is an appropriate approach to schedule sporadic tasks when a set of periodic hard real-time tasks are being run by using a rate monotonic schedulers? 1 point

a. Schedule the sporadic tasks using a background-foreground scheduling technique with the sporadic tasks being run as the background
b. Schedule the sporadic tasks with the real-time tasks using a time slicing technique
c. Schedule the sporadic tasks using a polling server
d. Schedule the sporadic tasks using a separate EDF (Earliest Deadline First) scheduler
e. Schedule the sporadic tasks using a separate MLF (Minimum Laxity First) scheduler

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

3) Consider a set of three periodic real-time tasks that are to be run on a uniprocessor using a rate monotonic scheduler. The task characteristics are given in the following table. What would be the worst case completion time for **Task1**? 1 point

Task Set (All times are in milliseconds)					
Task Name	**Phase**	**Execution time**	**Period**	**Self Suspension time**	**Deadline**
Task1	200	10	100	5	100
Task2	150	25	150	10	150
Task3	100	20	40	5	40
Task4	0	15	200	7	200

a. 40 milliseconds
b. 60 milliseconds
c. 70 milliseconds
d. 80 milliseconds
e. 90 milliseconds

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

4) Consider a set of three periodic real-time tasks that are to be run on a uniprocessor using a rate monotonic scheduler. The task characteristics are given in the following table. What would be the worst case completion time for **Task3**? 1 point

Task Set (All times are in milliseconds)					
Task Name	**Phase**	**Execution time**	**Period**	**Self Suspension time**	**Deadline**
Task1	200	10	100	5	100
Task2	150	25	150	10	150
Task3	100	20	40	5	40
Task4	0	15	200	7	200

a. 20 milliseconds
b. 25 milliseconds
c. 40 milliseconds
d. 45 milliseconds
e. 65 milliseconds

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

5) Consider a set of three periodic real-time tasks that are to be run on a uniprocessor using a rate monotonic scheduler. The task characteristics are given in the following table. What would be the worst case completion time for **Task2**? 1 point

Task Set (All times are in milliseconds)					
Task Name	**Phase**	**Execution time**	**Period**	**Self Suspension time**	**Deadline**
Task1	200	10	100	5	100
Task2	150	25	150	10	150
Task3	100	20	40	5	40
Task4	0	15	200	7	200

a. 140 milliseconds
b. 145 milliseconds
c. 167 milliseconds
d. 170 milliseconds
e. 180 milliseconds

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

6) In a system with low processor utilization, which one of the following is an acceptable way to reduce response time jitter of a specific task? 1 point

a. Disable interrupts
b. Increase priority of the task
c. Make all paths in the code of the module take equal time
d. Reduce jitter of higher priority tasks
e. Reduce arrival time jitter

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

7) Assume that there are 4 periodic hard real-time tasks in a system, but only 3 priority levels are available. The task characteristics are shown in the following table. Which one of the following is the priority assignment to tasks obtained by using the uniform scheme? Assume that a lower priority value indicates higher priority. That is, 1 is the highest priority. Also assume that Pri(Ti) gives the priority assigned to the task Ti. 1 point

Task Set (All times are in milliseconds)			
Task Name	**Phase**	**Execution time**	**Period**	**Deadline**
T1	200	10	100	100
T2	150	25	150	150
T3	100	20	40	40
T4	0	15	200	200

a. Pri(T1)=1, Pri(T2)=2,Pri(T3)=3,Pri(T4)=3
b. Pri(T1)=1, Pri(T2)=3,Pri(T3)=3,Pri(T4)=2
c. Pri(T1)=2, Pri(T2)=3,Pri(T3)=1,Pri(T4)=3
d. Pri(T1)=3, Pri(T2)=2,Pri(T3)=1,Pri(T4)=3
e. Pri(T1)=2, Pri(T2)=3,Pri(T3)=1,Pri(T4)=1

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

8) Assume that there are 5 periodic hard real-time tasks in a system, but only 3 priority levels are available. The task characteristics are shown in the following table. Which one of the following is the priority assignment to tasks obtained by using the uniform scheme? Assume that a lower priority value indicates higher priority. That is, 1 is the highest priority. Also assume that Pri(Ti) gives the priority assigned to the task Ti. 1 point

Task Set (All times are in milliseconds)				
Task Name	**Phase**	**Execution time**	**Period**	**Deadline**
T1	200	10	100	100
T2	150	25	150	150
T3	100	20	40	40
T4	0	15	200	200
T5	50	20	230	230

a. Pri(T1)=1, Pri(T2)=2,Pri(T3)=3,Pri(T4)=3, Pri(T5)=3
b. Pri(T1)=1, Pri(T2)=3,Pri(T3)=3,Pri(T4)=2, Pri(T5)=3
c. Pri(T1)=2, Pri(T2)=2,Pri(T3)=1,Pri(T4)=3,Pri(T5)=3
d. Pri(T1)=3, Pri(T2)=2,Pri(T3)=1,Pri(T4)=3,Pri(T5)=3
e. Pri(T1)=2, Pri(T2)=3,Pri(T3)=1,Pri(T4)=1, Pri(T5)=3

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

9) Assume that there are 5 periodic hard real-time tasks in a system, but only 3 priority levels are available. The task characteristics are shown in the following table. Which one of the following is the priority assignment to tasks obtained by using the arithmetic scheme? Assume that a lower priority value indicates higher priority. That is, 1 is the highest priority. Also assume that Pri(Ti) gives the priority assigned to the task Ti. 1 point

Task Set (All times are in milliseconds)				
Task Name	**Phase**	**Execution time**	**Period**	**Deadline**
T1	200	10	100	100
T2	150	25	150	150
T3	100	20	40	40
T4	0	15	200	200
T5	50	20	230	230
T6	75	20	250	250

a. {T1,T3} →1, {T2,T4} →2, {T5,T6} →3
b. {T1,T2} →1, {T3,T4} →2, {T5,T6} →3
c. {T3,T4} →1, {T1,T2} →2, {T5,T6} →3
d. {T1} →1, {T2,T3} →2, {T4,T5,T6} →3
e. {T3} →1, {T1,T2} →2, {T4,T5,T6} →3

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
e.

10) Which of the following statements concerning periodic servers being used in real-time systems deploying a rate monotonic scheduler are correct? 1 point

a. It is a high priority periodic real-time task
b. Each periodic server handles multiple sporadic and aperiodic tasks
c. There can be multiple periodic servers in a system.
d. The period and execution time of a periodic server is decided based on the characteristics of the other periodic tasks present in the system.
e. If on an invocation of the periodic server, there are no ready aperiodic or sporadic tasks, then it runs an idle task
f. A Periodic server does not in any way affect the schedulability of a system

a.
b.
c.
d.
e.
f.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.
b.
c.

11) Suppose three sporadic tasks are to be scheduled using a polling server in a real-time system. Assume that a sporadic task is specified by the tuple <computation time, relative deadline>. In this notation, the three sporadic tasks are specified by <10milliseconds, 100 milliseconds>, <30milli Seconds, 200 milliseconds> and <40milli Seconds, 500 milliseconds>. Besides the polling server, three other periodic hard real-time tasks are also being run on the system. What should be the period of the polling server? 1 point

a. 10 milliseconds
b. 50 milliseconds
c. 100 milliseconds
d. 200 milliseconds
e. 500 milliseconds

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

12) Assume that a task is specified by the triplet (P,E,D), where P is the task period, E is the execution time, and D is the deadline. Consider three periodic hard real-time tasks are to be scheduled using a RM (Rate Monotonic) scheduler on a uniprocessor: T1=(100 milli Seconds,30 milli Seconds,100 milli Seconds); T2=(120 milli Seconds,30 milli Seconds,120 milli Seconds); T3=(150 milli Seconds,20 milli Seconds,150 milli Seconds). Assume that T3 is the most critical task. What will be the specification of T3 for schedulability analysis, after applying the period transformation technique to make it the highest priority task? 1 point

a. (150 milli Seconds,20 milli Seconds,150 milli Seconds).
b. (75 milli Seconds, 10 milli Seconds, 75 milli Seconds).
c. (75 milli Seconds,20 milli Seconds,75 milli Seconds).
d. (75 milli Seconds, 20 milli Seconds,150 milli Seconds).
e. (50 milli Seconds,10 milli Seconds,50 milli Seconds).

a.
b.
c.
d.
e.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.