Week 3 : Assignment 3

The due date for submitting this assignment has passed.

Due on 2021-08-25, 23:59 IST.

As per our records you have not submitted this assignment.

1) 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 a set of three three periodic real-time tasks {T1,T2,T3} are to be scheduled using an EDF (Earliest Deadline First) scheduler on a uniprocessor: T1=(100,30,100), T2=(150,20,150), T3=(200,25,200). What would be the processor utilization due to the set of three tasks?

1 point

a. 0.5
b. 0.56
c. 0.6
d. 0.67
e. 0.7

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

2) In a foreground-background scheduler, a background task requiring 700milliseconds is to be run. Two foreground tasks T1 and T2 with execution times 20 milliseconds and 20 milliseconds respectively and periods of 50 milliseconds and 100 milliseconds respectively are also to be run. Assume that all tasks have zero phasing. What would be the expected completion time for the background task?

1 point

a. 1000 milliseconds
b. 1100 milliseconds
c. 1400 milliseconds
d. 1550 milliseconds
e. 1750 milliseconds

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
e.

3) What would be the processor utilization due to the following three tasks when run on a uniprocessor?

1 point

Task	Execution Time (in millisec)	Period (in millisec)	Deadline (in millisec)
T1	10	100	100
T2	20	150	150
T3	5	50	50

a. 0.68
b. 0.56
c. 0.44
d. 0.34
e. 0.24

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

4) While using a cyclic scheduler, for selecting a suitable frame size, it is necessary that the frame size should be larger than the largest execution time of any task. What problems may occur if frame size is less than the largest execution time among all tasks?

1 point

a. Assignment of tasks to frames would become computationally intractable
b. Multiple tasks may get assigned to a frame
c. Cyclic executive would become complex, as it would have to support preemption
d. Size of the schedule table would increase
e. Scheduler would get invoked too many times, thereby increasing the scheduling overhead
f. Cyclic executive would become complex, as it would have to keep track of the execution time already utilized by a task
g. Unless a job runs to completion, its partial results might be used by other jobs, leading to inconsistency

- a.
- b.
- c.
- d.
- e.
- f.
- g.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.
e.
f.
g.

5) Consider that three periodic tasks T1, T2, and T3, shown in the following table are to be scheduled using a cyclic scheduler. What are the feasible frame sizes?

1 point

Task	Execution Time (in millisec)	Period (in millisec)	Deadline (in millisec)
T1	15	100	100
T2	27	150	150
T3	10	50	50

a. 30 only
b. 40 only
c. 30 and 50 only
d. 30,50, and 60 only
e. 30,50,60, and 100 only

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

6) Consider that two periodic tasks T1 and T2 shown in the following table are to be scheduled using a cyclic scheduler. What are the feasible frame sizes?

1 point

Task	Execution Time (in millisec)	Period (in millisec)	Deadline (in millisec)
T1	10	30	30
T2	22	60	60

a. 10
b. 20
c. 25
d. 30
e. No frame size is feasible without splitting task T2

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

7) Suppose a real-time system deploys a foreground-background scheduler. An aperiodic task requiring 1000sec execution time becomes ready at time 0. There are three foreground period tasks as shown in the following table. What will be the completion time of the periodic task?

1 point

Task	Phase	Execution Time (in millisec)	Period (in millisec)	Deadline (in millisec)
T1	0	10	100	100
T2	0	20	150	150
T3	0	5	50	50

a. 1500 millisecs
b. 1800 millisecs
c. 2500 millisecs
d. 3000 millisecs
e. 3600 millisecs

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

8) Which of the following can be said of the Earliest Deadline First (EDF) task scheduling algorithm?

1 point

a. Dynamic priority algorithm
b. Event-driven algorithm
c. Optimal uniprocessor task scheduling algorithm
d. Good transient overload handling capability
e. Good support for resource sharing among hard real-time tasks

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
b.
c.

9) 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. Suppose two tasks: T1=(4,2,4) and T2=(6,3,6) are to be scheduled using a cyclic scheduler. Which of the following are feasible frame sizes?

1 point

a. 3
b. 4
c. 5
d. 6
e. 12

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
b.

10) Which of the following statements concerning rate monotonic scheduler (RMS) and earliest deadline first scheduler (EDF) are **true**?

1 point

a. EDF is more proficient than RMS
b. RMS is more proficient than EDF
c. RMS and EDF are equally proficient
d. The proficiency of RMS and EDF cannot be compared
e. EDF and RMS are both even-driven schedulers

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
e.

11) Which of the following types of events define the scheduling points for a rate monotonic scheduler?

1 point

a. Arrival of task instances
b. Completion of task instances
c. Interrupts generated by a one-shot timer
d. Interrupts generated by a pre-set periodic timer

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
b.

12) Suppose a cyclic scheduler is used to schedule a set of three periodic real-time tasks {T1, T2, T3}. The execution time, period, and deadline of a task Ti is given by $\langle e_i, P_i, d_i \rangle$. A chosen frame size must satisfy which of the following?

0 points

a. $F > \max(e1,e2,e3)$
b. $(LCM(P1,P2,P3)/F) \times F = LCM(P1,P2,P3)$
c. $F - (\gcd(F,Pi)/2) < di/2$ for each of T1,T2,T3
d. $2 \times F - \gcd(F,Pi) > di$ for each of T1,T2,T3
e. $F - 2 \times \gcd(F,ei) \leq di$ for each of T1,T2,T3

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect.
Score: 0

Accepted Answers:
e.