

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Lecture 01 : Introduction

Lecture 02 : Introduction

Lecture 03 : Characteristics of a real-time embedded system

Lecture 04 : Characteristics of a real-time embedded system (Contd.)

Lecture 05 : Types of real-time tasks

Lecture Materials

Quiz: Week 1 : Assignment 1

Feedback Form of Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Assignments Solution

Download Videos

Live Interactive Session

# Week 1 : Assignment 1

The due date for submitting this assignment has passed.

Due on 2021-08-18, 23:59 IST.

As per our records you have not submitted this assignment.

1) Which of the following are important characteristics of a hard real-time task?

1 point

- ☐ a. The result produced by a task is discarded if produced after deadline
- ☐ b. Application fails if the task produces correct result after its deadline
- ☐ c. Application fails if the task produces incorrect result after its deadline
- ☐ d. Application fails if the task produces incorrect result before the deadline
- ☐ e. The utility of the result produced by a task decreases with time if the result is produced after the deadline
- ☐ f. The earlier is the result produced by a task, the higher is its utility.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. Application fails if the task produces correct result after its deadline

c. Application fails if the task produces incorrect result after its deadline

d. Application fails if the task produces incorrect result before the deadline

2) Which one of the following is an important characteristic of a soft real-time task?

1 point

- ☐ a. The result produced by the task is discarded if produced after deadline
- ☐ b. Application fails if the task produces correct result after its deadline
- ☐ c. Application fails if the task produces correct result before its deadline
- ☐ d. The utility of the result produced by a task decreases with time if the result is produced after the deadline
- ☐ e. The utility of the result is independent of the time at which it is produced.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. The utility of the result produced by a task decreases with time if the result is produced after the deadline

3) Which one of the following is an important characteristic of a firm real-time task?

1 point

- ☐ a. The result produced by the task is discarded if produced after deadline
- ☐ b. Application fails if the task produces a correct result after its deadline
- ☐ c. Application fails if the task produces a correct result after its deadline
- ☐ d. Utility of the result produced by a task decreases with time if the result is produced after the deadline
- ☐ e. The earlier the result produced by a task, the higher is its utility.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a. The result produced by the task is discarded if produced after deadline

4) Which one of the following tasks can be considered to be a hard real-time task?

1 point

- ☐ a. Issue a book using a library management system
- ☐ b. Withdraw cash from a bank ATM
- ☐ c. Planning of the next step by a robot
- ☐ d. Saving an opened file by a word processor
- ☐ e. An on-line e-commerce transaction

No, the answer is incorrect.

Score: 0

Accepted Answers:

c. Planning of the next step by a robot

5) Which of the following factors have resulted in a surge of embedded applications being used world-wide?

1 point

- ☐ a. Flexibility of applications due to the Internet
- ☐ b. Trend of reducing power consumption by computers
- ☐ c. Trend of reducing cost of computers
- ☐ d. Realization of quantum computers
- ☐ e. Increasing processing power and reliability of computers

No, the answer is incorrect.

Score: 0

Accepted Answers:

a. Flexibility of applications due to the Internet

b. Trend of reducing power consumption by computers

c. Trend of reducing cost of computers

e. Increasing processing power and reliability of computers

6) Which of the following are not true of a reactive system?

1 point

- ☐ a. In these systems there is a non-terminating interaction with environment
- ☐ b. These systems are specific to chemical reaction control systems
- ☐ c. In such systems events occur due to changes to the environment
- ☐ d. Many embedded systems are reactive systems
- ☐ e. The system responds to events in the environment and produces corresponding actions

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. These systems are specific to chemical reaction control systems

7) Operator queries in a nuclear power plant control system can be considered as which one of the following types of events?

1 point

- ☐ a. Periodic
- ☐ b. Aperiodic
- ☐ c. Sporadic
- ☐ d. Semi-periodic
- ☐ e. Aperiodic as well as sporadic

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. Aperiodic

8) A fire alarm in a chemical plant can be considered as which one of the following types of events?

1 point

- ☐ a. Periodic
- ☐ b. Aperiodic
- ☐ c. Sporadic
- ☐ d. Semi-periodic
- ☐ e. Aperiodic as well as sporadic

No, the answer is incorrect.

Score: 0

Accepted Answers:

c. Sporadic

9) Which one of the following is a multi-rate system?

1 point

- ☐ a. System with multiple periodic tasks
- ☐ b. System with multiple periodic tasks with same polling frequency
- ☐ c. System with multiple periodic tasks with harmonically-related polling frequencies only
- ☐ d. System with multiple periodic tasks with different polling frequencies
- ☐ e. System with a mixture of periodic, aperiodic, and sporadic tasks

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. System with multiple periodic tasks with different polling frequencies

10) Which of the following are not true of the servos used in embedded real-time systems, such as a robot?

1 point

- ☐ a. A servo is a small wireless device that has a shaft
- ☐ b. The shaft of a servo can be positioned at specific angular positions by sending a coded signal.
- ☐ c. Servos are used as transducers of energy
- ☐ d. As the coded signal applied to a servo changes, the angular position of the shaft of the servo changes

No, the answer is incorrect.

Score: 0

Accepted Answers:

c. Servos are used as transducers of energy

11) Suppose voice signals range from 100Hz to 300Hz, for converting the analog speech signal into digital signal, what should be the minimum sampling rate according to the Nyquist criterion?

1 point

- ☐ a. 100 samples per second
- ☐ b. 200 samples per second
- ☐ c. 300 samples per second
- ☐ d. 600 samples per second
- ☐ e. 900 samples per second

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. 600 samples per second

12) Which of the following are true of a "fail-safe" state of an embedded system?

1 point

- ☐ a. No damage can result if the embedded system fails in this state.
- ☐ b. Severe damage can result if the embedded system fails in this state.
- ☐ c. The embedded system cannot fail if it is in a fail-safe state
- ☐ d. Fail-safe states help to separate the issues of safety and reliability.
- ☐ e. Fail-safe states help to seamlessly integrate the issues of safety and reliability.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a. No damage can result if the embedded system fails in this state.

d. Fail-safe states help to separate the issues of safety and reliability.