**NATIONAL INSTRUMENTS™**

## Certified LabVIEW Associate Developer Examination

Examinee _____ Date: _____

Administrator _____ Date: _____

**Note: The use of the computer or any reference materials is NOT allowed during the exam.**

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>
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**Exam Details:**
Time allocated: 1 hour
Type of exam items: Multiple choice
Number of exam items: 40 questions
Passing Grade: 70%

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## Answers Page:

To quickly check your answers against the solutions on the Solutions Page, record your answers on this Answers Page. Detach this page and record your answers as you go along This page is not included in the actual CLAD exam; it is included here for practice purposes only. The Solutions Page is at the end of the Sample Exam.

1. _____
2. _____
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36. _____
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38. _____
39. _____
40. _____

**Sample Exam Items:**

1. Where can a VI be documented so that the description appears in the Show Context Help popup window?
   a. In the VI Properties Documentation window
   b. Typing in the Show Context Help window
   c. Creating a free label on the front panel
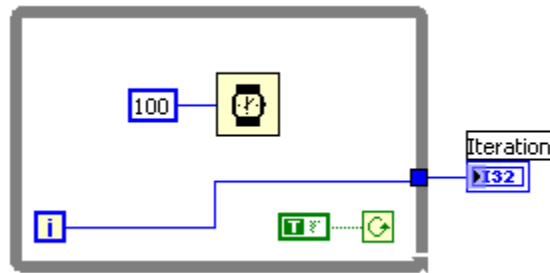   d. Editing the LabVIEW help files

2. Can a wire be used to pass data between loops that are intended to run in parallel?
   a. Yes
   b. No

3. Which of the following describes a Tab Control?
   a. A control that outputs ASCII values equal to the selected tab label
   b. A type of enumerated control
   c. A control that outputs a cluster of the controls / indicators on the tabs
   d. A controls that outputs the tab order of the controls on the front panel

4. Which server must be started before running DataSocket VIs
   a. HTTP server
   b. DataSocket server
   c. FTP server
   d. OPC server

5. A coercion dot indicates that:
   a. The data types are consistent
   b. A polymorphic operation will be performed on the data
   c. A data buffer is created to handle data conversion
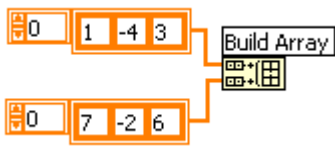   d. Data values are being coerced because they are out of range

6. Which of the following statements is true about the following block diagram?



    a. The loop will execute once and the iteration terminal, [i], will output a value of one

    b. The loop will execute once and the iteration terminal, [i], will output a value of zero

    c. The loop will execute infinitely and the program will have to be aborted

    d. The loop will not execute and the iteration terminal, [i], will return a null value

7. Which of the following cannot be used to transfer data?
    a. Semaphores
    b. Queues
    c. Notifiers
    d. Local variables

8. Which of the following terminals controls how many times a For loop executes?
    a. [i]
    b. [↻]
    c. [A]
    d. [N]

9. You have a control on the front panel of a VI and you need to modify one of its properties at run time. Which of the following is the best approach you would take?
    a. Create an implicit property node and select the property to modify
    b. Create a control reference, pass the reference to a property node and select the property to modify
    c. Create a linked shared variable and select the property to modify the property
    d. Create a local variable and select the property to modify

10. Formula nodes accept which of the following operations?
    a. Basic programming language instructions *Input* and *Print*
    b. Embedding of SubVIs within the Formula Node
    c. Pre and post increment (++) and decrement (--) as in the C language
    d. The use of nested Formula Node structures

11. Which of the following is the best method to update an indicator on the front panel?
    a. Use a Value property node
    b. Wire directly to the indicator terminal
    c. Use a local variable
    d. Use a functional global variable

12. Which of the following functions assembles Cluster elements by their owned labels?
    a. Unbundle by Name
    b. Unbundle
    c. Bundle by Name
    d. Bundle

13. What is the output of the Build Array function in the following block diagram when *Concatenate Inputs* is selected?



    a. 1-D Array of {1, -4, 3, 7, -2, 6}
    b. 1-D Array of {1, 7, -4, -2, 3, 6}
    c. 2-D Array of {{1, -4, 3, 0}, {7, -2, 6}}
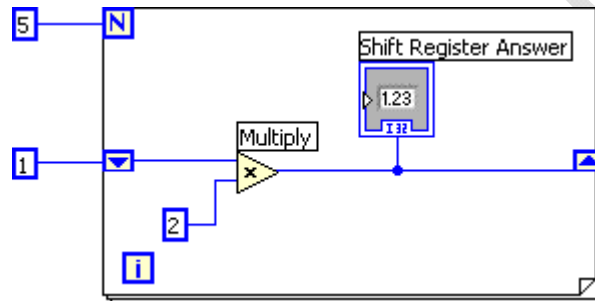    d. 2-D Array of {{1, -4, 3}, {7, -2, 6}}

14. What is the output of the Initialize Array function after the following code has executed?



    a. 1-D Array of {3, 3, 3, 3}
    b. 1-D Array of {4, 4, 4}
    c. 1-D Array of {3, 4}
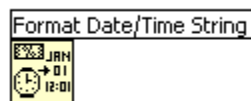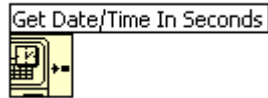    d. 1-D Array of {4, 3}

15. What is one disadvantage of using the State Machine VI architecture?
    a. A State Machine can only traverse states in order
    b. If two state changes occur at the same time, only the first state change will be handled and the second will be lost
    c. The diagram becomes significantly larger when changing from a general architecture to a State Machine
    d. State Machines cannot acquire data or use DAQ functions

16. What is the best method to stop a While loop on an error condition?
    a. Compare the Status boolean of an error cluster with a constant and wire it to the Stop terminal
    b. Connect the error wire directly to the Stop terminal
    c. Create an Event structure to handle the error event
    d. Use the Error Handler VI to automatically handle the error

17. What mechanical action of a Boolean would you use to mimic a button on a Windows dialog?
    a. Switch Until Released
    b. Switch When Released
    c. Latch Until Released
    d. Latch When Released

18. Which combination of words correctly completes the following statement?

    Unlike _____, which display an entire waveform that overwrites the data already stored, _____ update periodically and maintain a history of the data previously stored.

    a. Graphs; Charts
    b. Charts; Plots
    c. Plots; Graphs
    d. Charts;  Graphs

19. In what instance would you use the Probe tool rather than Highlight Execution?
    a. To see the flow of data
    b. To see the value of a wire in real-time
    c. To look into a SubVI, as the process is running
    d. To slowdown the VI and show data values in wires

20. You customize a control, select Control from the Type Def. Status pull-down menu, and save the control as a .ctl file. You then use an instance of the custom control on your front panel window. If you open the .ctl file and modify the control, does the control on the front panel window change?
    a. Yes
    b. No

21. You develop a SubVI that only outputs a value and need to use this SubVI in a (calling) VI. Which of the following is the best way to enforce dataflow to control the execution of the SubVI?
    a. Use the SubVI in a Sequence structure
    b. Modify the SubVI to have dummy inputs that can be used from the calling VI
    c. Modify the SubVI to have Error clusters that can be used from the calling VI
    d. Modify the SubVI to have a global variable and use it from the calling VI

22. What is the value in **Shift Register Answer** after the following code has executed?



    a. 16
    b. 24
    c. 32
    d. 10

23. Which Chart update mode should be used to draw new data from left to right, then clear the chart and draw new data again from left to right?
    a. Strip Chart
    b. Scope Chart
    c. Sweep Chart
    d. Step Chart

24. Which of the following illustrates an advantage of a global variable over a local variable?
    a. A global variable can pass data between two independent VIs running simultaneously
    b. Only the global variable can pass array data, local variables cannot
    c. Global variables follow the dataflow model, and therefore cannot cause race conditions
    d. Global variables do not require owned labels to operate

25. Which timing function (VI) is the best choice for timing control logic in applications that run for extended periods of time?

a. **Tick Count (ms)**

b. **Wait (ms)**

c. **Get Date/Time In Seconds**

d. **Format Date/Time String**

26. Under which of the following conditions does a For loop stop executing?
    a. When a true value is present at the conditional terminal and the conditional terminal is 🔴
    b. When the value of the iteration terminal, $i$, is one less than the value of the count terminal, $N$
    c. When the value of the iteration terminal, $i$, is one more than the value of the count terminal, $N$
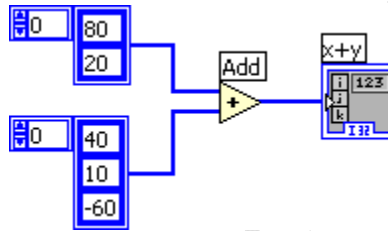    d. None of the above

27. You are inputting data that represents a circle. The circle data includes an $x$ position, a $y$ position, and a radius. All three pieces of data are double-precision. In the future, you might need to store the color of the circle, represented as an integer. How should you represent the circle on your front panel window?
    a. Three separate controls for the two positions and the radius.
    b. A cluster containing all of the data.
    c. A type definition containing a cluster.
    d. An array with three elements.

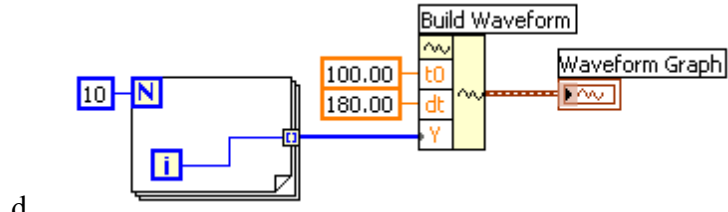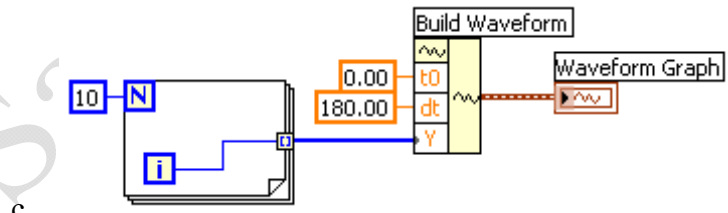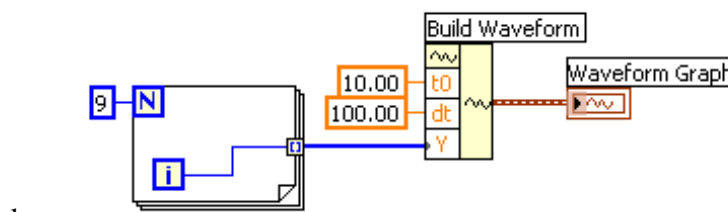28. Which of the following will cause an event to be captured by the LabVIEW Event Structure?
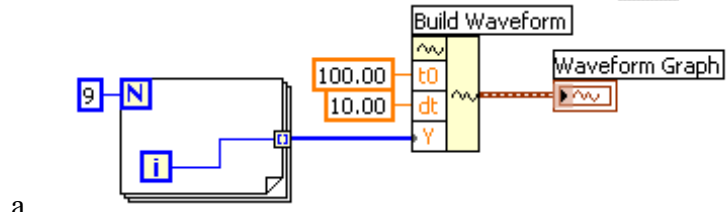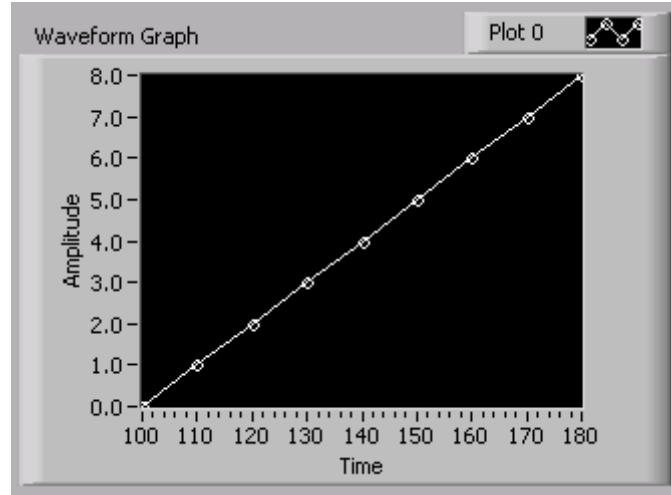    a. Changing a value on a Front Panel control via a mouse click
    b. Update of a Front Panel control using a property node
    c. Programmatic update of a Front Panel control via a control reference
    d. Using VI Server to update a Front Panel control

29. Which of the following does not conform to data flow programming paradigm?
    a. Shift Registers
    b. Tunnels
    c. SubVIs
    d. Local Variables

30. You must store data that other engineers must analyze with Microsoft Excel. Which file storage format should you use?
    a. Tab-delimited ASCII
    b. Custom binary format
    c. TDM
    d. Datalog
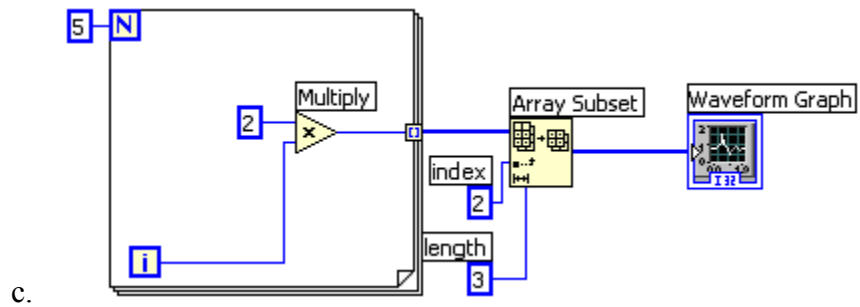
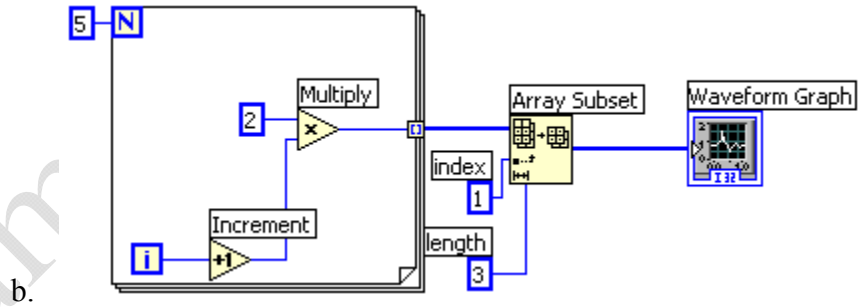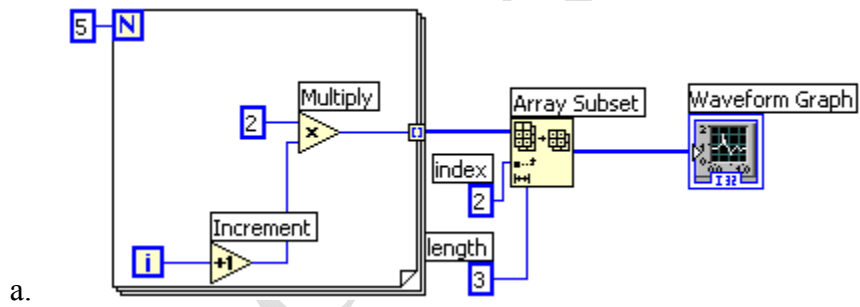31. What is the result of the following Array addition?



    a. 1-D Array of {80, 20, 40, 10, -60}
    b. 1-D Array of {120, 30, -60}
    c. 1-D Array of {120, 30}
    d. 2-D Array of {{120, 90, 20}, {60, 30, -40}}

32. Which of the following statements is false?
    a. A SubVI connector pane defines where to wire inputs and outputs
    b. The color of a SubVI connector pane terminal matches the data type it is connected to
    c. You must have an icon/connector to use a SubVI
    d. A SubVI icon can be edited from the functions palette

33. The most efficient method for creating an array is:
    a. Using a For loop with Auto-indexing
    b. Placing a build array function in a While loop
    c. Initializing an array and then replacing elements in a While loop
    d. Using a While loop with Auto-Indexing

34. The following block diagram represents which common type of VI architecture?



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    a. Multiple Case Structure VI
    b. General VI
    c. State Machine VI
    d. Parallel Loop VI

35. Which of the following statements is true about the iteration terminal
    a. It returns the number of times the loop has executed
    b. It returns the number of times the loop has executed, plus one
    c. It returns the number of times the loop has executed, minus one
    d. It returns a constant number

36. Which block diagram would generate the following front panel?



a.



b.



c.



d.

37. Which of the following Block Diagrams could produce this result in Waveform Graph?



a.



b.



c.

d.

More than one answer *may* be correct for these questions.  Circle *ALL* of the correct answers.

38. If an input name on the Show Context Help window is in bold for a SubVI, which of the following conditions are true?
    a. Input values must be scalar.
    b. An input is recommended, but not required.
    c. An input is required.
    d. A broken run arrow will result unless the input is wired.

39. Which of the following apply to Property Nodes?
    a. Property Nodes allow attributes of front panel objects to be programmatically manipulated.
    b. Property Nodes can be used to update the values contained in a front panel object.
    c. More than one Property Node can be used for a single front panel object.
    d. Property Nodes contained in a SubVI will always cause the front panel to be loaded in memory.

40. Which VI memory components are ALWAYS resident for a SubVI?
    a. Data Space
    b. Front Panel
    c. Block Diagram
    d. Code

**Solutions Page:**

Below are the solutions to the CLAD Sample Exam. To quickly check your answers, record them on the Answers Page, detach the Answers Page, and compare it, side-by side, with the Solutions Page. This Solutions Page is not included in the actual CLAD exam; it is included here for practice purposes only.

1. a
2. b
3. b
4. b
5. c
6. c
7. a
8. d
9. a
10. c
11. b
12. c
13. a
14. a
15. b
16. b
17. b
18. a
19. b
20. b
21. c
22. c
23. b
24. a
25. c
26. b
27. c
28. a
29. d
30. a
31. c
32. d
33. a
34. c
35. c
36. a
37. a
38. c, d
39. a, b, c, d
40. a, d