Quiz 1

⚠ This is a preview of the published version of the quiz

Started: Jan 25 at 6:46am

Quiz Instructions

Open notes; open books. That is, you may use your notes, homework solutions, lab handouts, etc. You may use the books that we've selected as resources.

You may **not** use any online calculators. You may **not** use a code compiler, either online or otherwise.

Units matter. You will lose points if you neglect them.

The score you receive at the end of the quiz will be preliminary. There will be questions that I will need to grade manually, and other adjustments. For example, if you enter "4.0m" but the solution key has "4.0 m", of course you will still get points, but the automatic grader will get it wrong, so I'll have to adjust it.

Question 1 — 1 pts

A function that waits until it completes before moving to the next line of code is called what kind of function?

blocking

Question 2 — 1 pts

In the following code, what will x be after the while loop completes?

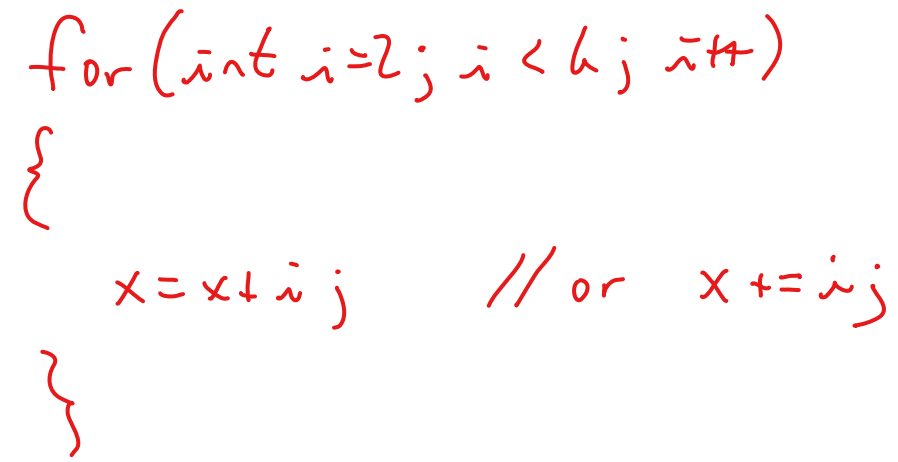
```
int x = 0;
int i = 2;
while(i < 6)
{
  x = x + i;
  i++;
}
```

i	x
2	0+2 = 2
3	2+3 = 5
4	5+4 = 9
5	9+5 = 14

Question 3 — 1 pts

Re-write the code in the previous question to use a for loop instead of a while loop.

HTML Editor



0 words

Question 4 — 1 pts

An ultrasonic sensor can be classified as what kind of sensor?

- Proprioceptive, passive
- Proprioceptive, active
- Exteroceptive, passive
- Exteroceptive, active

Question 5 — 1 pts

A constructor is a special function that is called when?

- ○ At the beginning of a program.
- ◉ When an object is created.
- ○ When you write code in Robot Mesh Studio..

Question 6 — 1 pts

An underwater sonar is used to detect objects. A ping is sent out and the echo received 720 ms later. How far away is the object if the speed of sound in water is 1440 m/s?

You must include units in your answer or it will be marked incorrect.

in 720ms, sound travels

$1440 \frac{m}{s} \cdot 0.720s = 1036.8m$, but it has to go there & back, so

518.4 m

Question 7 — 1 pts

You command your BaseBot, with the 1:5 gear ratio you have on it now, to drive forward with the following commands:

```
motorLeft.startRotateTo(3600, deg);
motorRight.rotateTo(3600, deg);
```

Assuming the wheel diameter is 10 cm (and the motors are set up such that they spin the same direction), how far does the BaseBot drive?

Don't forget to put the units!

With 1:5 gearing, the wheels will rotate twice,

So $2 \cdot 10cm \cdot \pi =$ 62.8cm

Question 8 — 1 pts

You want your BaseBot to drive forward until it hits a wall. To do this, you'll mount the button on the front of the robot and command the motors to stop when the button is pressed. Fill in the conditional for the while statement below (where the blank is).

```
#include "vex.h"
using namespace vex;

//#region config_globals
vex::brain  Brain;
vex::motor  motorLeft(vex::PORT5, vex::gearSetting::ratio18_1, true);
vex::motor  motorRight(vex::PORT6, vex::gearSetting::ratio18_1, false);
vex::bumper bumperFront(Brain.ThreeWirePort.A);
//#endregion config_globals


int main(void) {
    // Start here
    motorLeft.spin(vex::directionType::fwd);
    motorRight.spin(vex::directionType::fwd);

    while( _________________ ) {
        //do nothing
    }

    motorLeft.stop();
    motorRight.stop();
}
```

bumperFront.pressed() == 0
(other options possible)

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0 words

Question 9 — 1 pts

A robot has to exist in the physical world. This is referred to as:

- sensing
- actuation
- embodiment
- control

Question 10 — 1 pts

Which of the following sensors that you explored in lab are examples of analog sensors. Check all that apply.

- [ ] encoders
- [x] ultrasonic sensor
- [ ] button

line sensor

Quiz saved at 7:22am

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