

**Information Technology 1192(T)
1193(A)**

Semester 1, 2018

NAME: _____ **Line: 2IPLS1**

Teacher: Sanjay Sharma

Test Date: 9/3/2018

TASK CRITERIA	TASK	DUE DATE	WEIGHTING
1, 2, 3 & 4	Practical Test	Week 5	20%

VET Competencies Assessed in this Item:

Code	Competency Title	Core/Elective
BSBOHS201A	Participate in OHS processes	Core II
ICAICT201A	Use computer operating system and hardware	Core II
ICASA203A	Connect Hardware Peripherals	Elective II
ICAICT203A	Operate application software packages	Elective II
ICAPRG301A	Apply introductory programming techniques	Elective III

Criteria assessed in this Item:

Students will be assessed on the degree to which they demonstrate:

1. knowledge, understanding, application, analysis and evaluation
2. planning, designing, creating and implementing
3. communication and interpersonal skills
4. flexible, adaptive and creative thinking

General Assessment Criteria A/T/V/M

TASK CRITERIA	TASK	DUE DATE	WEIGHTING
1, 2, 3 & 4	Practical Test	Week 5	20%
1 & 4	Research Assignment	Week 8	30%
1, 2, 3 & 4	Theory Test	Week 12	20%
1, 2, 3 & 4	Assignment	Week 18	30%

IMPORTANT ASSESSMENT INFORMATION

The following are important factors common to all units of study at the Canberra College. See **Staff and Student Assessment Handbook** for details.

- ATTENDANCE AND PARTICIPATION
- LATE SUBMISSION OF WORK
- COMPETENCY – BASED ASSESSMENT
- RECOGNITION OF CURRENT COMPETENCIES (RCC) and PRIOR LEARNING (RPL)
- NOTIONAL ZEROS
- COMPENSATION
- CHEATING AND DISHONEST PRACTICE
- PLAGIARISM/ELECTRONIC SUBMISSION OF ASSIGNMENTS
- MODERATION PROCEDURES
- UNIT SCORE CALCULATION (where applicable)
- RIGHT TO APPEAL

Conditions for Item:

- All work is to be an individual effort.
- You will be given 1 period to complete this test.
- You will receive NO teacher assistance.
- This is an “open computer” test, so you may use resources or programs you created or form part of your learning and notes.
- No internal documentation is required in your programs.

Aim:

- To demonstrate your ability to program a microcontroller to effectively to monitor and control sensor inputs, processing and outputs

TEST

1. Create a folder called **Robotics_Test_Your_Name** (e.g. Robotics_Test_Jane_Smith) in your h: drive. You will save all programs/ Arduino Sketches and videos required to answer the questions for this test in this folder.
2. Using the Arduino IDE, your Esplora and the parts supplied, do the following:

Tertiary

- a. Write a Sketch that runs on your Esplora that after a **SHORT random** time span: **(6 marks)**
 - a. Turns on the LED in **Red**,
 - b. then after another **short** Random time switches the LED to **Green**, then switches off after displaying green for an appropriate period of time.
 - c. Arduino Reference library on Random() - <https://www.arduino.cc/en/Reference/Random>
 - d. (If you are having trouble with the randomise Function, make the LEDs flash the appropriate colour after an appropriately short period of time using delay() – however, you will lose 2 marks – see marking scheme at the end of this paper)
- b. Write another Sketch that: **(10 marks)**
 - a. Allows the LED to change colour depending on the direction of the tilt of the Esplora. Just 4 directions and 4 colours will do
 - b. the user can use the slider to increase or decrease the brightness of the LED anytime
 - c. and the user can press the “up” **button** to toggle the LED on and off
- c. Challenge: using the sample code below using elapsedMillis to count time until user input: **(4 marks)**
 - a. output onto the serial monitor the length of time it takes for the user to react from the time the Red LED comes on to the user pressing the button.

Timeout Waiting For Input

```
void loop() {                                // each time loop() runs,

    elapsedMillis waiting;                    // "waiting" starts at zero

    while (waiting < 10000) {

        if (Serial.available()) {

            char c = Serial.read();
```

```

    Serial.print("got char = "); // do something with c

    Serial.println(c);

    waiting = 0;           // reset waiting back to zero

}

}

Serial.println("waited 10 seconds, no data arrived");

}

```

Accredited

- a. Write a Sketch that runs on your Explora that after a **short** time span using delay(): **(4 marks)**
 - a. Turns on the LED in **Red**,
 - b. then after another short time switches the LED to **Green**.
- b. Write another Sketch that: **(6 marks)**
 - a. Lights the LED as green
 - b. the user has to press the “up” button to turn the LED Red and stays red after the button is released
 - c. the user can use the slider to increase or decrease the brightness of the LED anytime
 - d. and the user has to press the “down” button when the LED is Green to turn it off

Submission

You need to submit **ONE compressed (ZIPPED) folder only** named *Robotics_Test_your_name* (eg. Robotics_Test_Jane_Smith), containing all the Arduino Sketches and videos at the end of the test period.

You must keep an up to date copy of your work in your h: drive at all times as well as a backup on Google Drive.

Robotics Test Marking Rubric

Name: _____ Date: _____

	Section	Total	Mark
Problem 1 (Tertiary)	<ul style="list-style-type: none"> - LED turns Red - LED turns Green - Appropriate random function implemented 	2+2+2	
Problem 1 (Accredited)	<ul style="list-style-type: none"> - LEDs correctly light up - Appropriate delays implemented 	2+2	
Problem 2 (Tertiary)	<ul style="list-style-type: none"> - Colours change according to tilt - Slider varies the intensity of the LED - button press toggles the LED off/on 	4+4+2	
Problem 2 (Accredited)	<ul style="list-style-type: none"> - LED starts as green - Red LED lights up & stays on after button press - Slider changes LED brightness - Button press allows LED to turn off when GREEN 	1+1+2+2	
Problem 3 (Tertiary Challenge)	<ul style="list-style-type: none"> - Reaction time correctly measured using event trigger - Reaction time displayed on serial monitor 	3+1	
Total (T course)		20	
Total (A course)		10	

VET Competencies:

Result	Vocational competencies assessed via this task		Aspect of task addressing competency
	BSBOHS201A	Participate in OHS processes	Proper & safe use of Robot & tools to create circuits, equipment & evacuation drills
	ICAICT201A	Use computer operating system and hardware	Logging in correctly, starting app & interfacing computer with Robot
	ICASA203A	Connect Hardware Peripherals	Connecting & setting up interface with IDE & Robot
	ICAICT203A	Operate application software packages	Use of Programming IDE
	ICAPRG301A	Apply introductory programming techniques	Programming Robot to do tasks

Final Comment:
