**Course: Robotics and Mechatronics T**

**Unit: Building & Programming Circuits**

**Unit Value: 1.0 Semester 1, 2020 Assessment Value:** XX%

**Assessment Item:** Research Assignment **Teacher**: Mr C. Johnson

**Date Notified**: XXXXXXXXXX 2020 (Week XX)

Draft Due: XXXXXXXXXX 2020 (Week XX)

**Date Due:** XXXXXXXXXX 2020 (Week XX)

**TASK SUMMARY:**

This assignment has two parts. Part A is making a poster about common electronics componentry, including a little history. Part B is writing a persuasive essay relating to evaluating current e-waste approaches, in relation to ethics and sustainability.

Work submitted should not be hand-written, including text, diagrams, equations, tables, graphs. Appropriate computer applications should be used to produce you work. As an exception, complex diagrams may be hand drawn if they are difficult to produce with a computer, but they should be scanned or photographed for insertion into your work.

**NOTE**: This assignment is to be your own individual work, and there should be no collaboration between students. You may consult with your teacher if you are uncertain about what is required.

*Drafts will not be accepted after the due date above. The draft is for general feedback only and will not be marked and graded, and marks will be based only on the final submission.*

**TASK DETAILS:**

**PART A: Electronics Componentry Poster**

You are to create an A3 poster (PDF file, hard copy not required) that includes the following content:

* Outlines each of the following electronics componentry: resistor, capacitor, switch, fuse, inductor, diode, LED, transistor, transducer. In each case you should include a brief description of the purpose or function of the component (1-3 sentences), an example image of the physical component, and an example image of the symbol used in circuit diagrams (following the IEC 60617 standard).
* A historical overview of the progress of electronics by outlining these three devices: vacuum tubes, transistors, integrated circuits. For each device write up a maximum of 100 words indicating the significance each had in the development of electronics.
* Include a list of references to any source material you used, including sources of pictures or diagrams (unless you drew them yourself).

In producing your poster, you should also consider how to present the information in attractive and engaging way so that it communicates clearly.

**PART B: e-Waste Essay**

You are to write a persuasive essay of 600-800 words, addressing the following question: *“Are current Australian approaches to managing e-waste satisfactory, being both ethically responsible and environmentally sustainable?”* You will need to do some research to support your arguments with evidence, using in-text referencing where appropriate, and a final list of references at the end, all properly formatted.

As an appendix (not part of the word count), you should also include copies of any referenced pages, so your teacher can readily check your references. It is best if you compile this appendix as you use the sources and conduct your research, rather than trying to produce it after you have finished.

**ASSIGNMENT MARKING SCHEME** (T Course – Total 52 Marks)

| **Item Assessed** | **A Grade**  (100% - 85% marks) | **B Grade**  (84% - 70% marks) | **C Grade**  (69% - 55% marks) | **D Grade**  (54% - 40% marks) | **E Grade**  (39% - 0% marks) | **Marks** |
| --- | --- | --- | --- | --- | --- | --- |
| Poster: Component Outlines | ▪ Accurate and clear descriptions of the function of all components, with only a few minor errors  ▪ Accurate and clear images and symbols of all components, with only a few minor errors | ▪ Mostly accurate descriptions of the function of all components, mostly clear, with a few significant errors  ▪ Mostly accurate and clear images and symbols of all components, with a few significant errors or omissions | ▪ Generally accurate descriptions of all components, with a number of significant errors or missing significant information  ▪ Generally accurate images and symbols of all components, with a number of significant errors or omissions | ▪ Generally accurate descriptions of some components, with a number of significant errors or missing significant information  ▪ Generally accurate images and symbols of some components, with a number of significant errors or omissions | ▪ Descriptions of most components have significant errors or missing significant information  ▪ Images and symbols of most components have significant errors or omissions | /18 |
| Poster:  Historical Overview | ▪ Accurate, substantial and clear descriptions of the relative historical significance of vacuum tubes, transistors and integrated circuits, with only a few minor errors | ▪ Mostly accurate and clear descriptions of the historical significance of vacuum tubes, transistors and integrated circuits, with some substance, but with a few significant errors or omissions | ▪ Generally accurate descriptions of the historical significance of vacuum tubes, transistors and integrated circuits, with significant errors or omissions | ▪ Generally accurate historical information relating to vacuum tubes, transistors and integrated circuits, with significant errors or omissions | ▪ Basic or limited historical information relating to vacuum tubes, transistors and integrated circuits, with significant errors or omissions | /6 |
| Poster: Referencing | ▪ A final list of references is present, with all required information, and all appropriately formatted | ▪ A final list of references is present, mostly with all required information, and mostly appropriately formatted | ▪ A final list of references is present, generally appropriately formatted | ▪ A final list of references is present | ▪ No references are included | /4 |
| Poster: Communication | ▪ Consistently communicates clearly, concisely, accurately and coherently with flair  ▪ All information and explanations are communicated clearly and effectively using appropriate means  ▪ Style and methods of communicating are always appropriate for the genre and audience, and the result is highly effective and very engaging  ▪ All paragraphs are well-constructed, with very few or no grammatical or spelling errors  ▪ Always uses technical terminology appropriately and correctly | ▪ Generally communicates clearly, logically and accurately with confidence  ▪ Mostly information and explanations are communicated clearly and logically using appropriate means  ▪ Style and methods of communicating are mostly appropriate for the genre and audience, and the result is effective and somewhat engaging ▪ Most paragraphs are well-constructed, with few grammatical or spelling errors  ▪ Mostly uses technical terminology appropriately and correctly | ▪ Generally communicates clearly  ▪ Generally information and explanations are communicated clearly  ▪ Style and methods of communicating are generally appropriate for the genre and audience, and in general can be readily understood.  ▪ Paragraphs are generally satisfactorily-constructed, with some significant grammatical or spelling errors  ▪ Often uses technical terminology inappropriately and/or incorrectly | ▪ Often communicates without clarity  ▪ Some explanations are communicated clearly  ▪ Style and methods of communicating demonstrate minimal attempts to be appropriate for the genre and audience, and is often difficult to follow and understand.  ▪ Paragraphs are generally poorly-constructed, with many grammatical and spelling errors  ▪ Occasionally uses technical terminology appropriately and/or correctly | ▪ Consistently communicates without clarity  ▪ Very little explanation is communicated  ▪ Style and methods of communicating are not appropriate for the genre and audience, and is mostly difficult to follow and understand.  ▪ Paragraphs are generally poorly-constructed, with many grammatical and spelling errors  ▪ Never uses technical terminology appropriately and/or correctly | /6 |
| Essay:  Argument | ▪ Shows full awareness of the scope, complexities, implications and subtleties of ethical and environmental issues related to e-waste  ▪ Shows outstanding integration and synthesis from a range of sources and perspectives  ▪ Achieves an insightful and convincing argument which resolves complexity or conflict in the sources  ▪ Demonstrates ability to evaluate alternative approaches in regard ethical and environmental issues related to e-waste  ▪ Sophisticated evaluation and analysis of ethical and environmental responsibilities related to e-waste | ▪ Shows awareness of the scope, complexities and implications of ethical and environmental issues related to e-waste  ▪ Successfully integrates and synthesises from a range of sources and perspectives  ▪ Achieves a clear and convincing argument showing some awareness of complexity or conflict in the sources  ▪ Demonstrates ability to identify alternative approaches in regard ethical and environmental issues related to e-waste  ▪ Analyses and explains ethical and environmental responsibilities related to e-waste | ▪ Shows sound understanding of ethical and environmental issues related to e-waste and awareness of its scope  ▪ Adequately integrates ideas from a range of sources  ▪ Constructs an argument based on simple analysis of sources  ▪ Describes ethical and environmental responsibilities related to e-waste | ▪ Shows some understanding of ethical and environmental issues related to e-waste  ▪ Refers to obvious sources  ▪ Shows limited insight or perspective  ▪ Constructs a descriptive narrative  ▪ Has limited recognition of ethical and environmental responsibilities related to e-waste | ▪ Shows limited understanding of ethical and environmental issues related to e-waste  ▪ Constructs a descriptive narrative | /9 |
| Essay: Referencing | ▪ Always uses inline referencing where substantiation is needed, with an appropriately formatted list of references  ▪ Use of references demonstrate fluency in understanding relevant literature, and a consistent ability to deeply understand, evaluate and apply ideas of others  ▪ Referenced sources are always credible and of academic quality and relevant  ▪ Copies of referenced source material is included as an appendix | ▪ Sometimes uses inline referencing appropriately, with an appropriately formatted list of references  ▪ Use of references demonstrate competency in understanding relevant literature, and some ability to understand, evaluate and apply ideas of others  ▪ Some sources are of academic quality, and most sources are credible and relevant  ▪ Copies of referenced source material is included as an appendix | ▪ A list of references generally appropriately formatted  ▪ Use of references demonstrate some understanding of and some ability to interact with the ideas of others  ▪ Referenced sources usually have some relevance and some credibility  ▪ Copies of referenced source material is included as an appendix | ▪ Some references are included, having some relevance and credibility | ▪ No references are included, or no references have any relevance or credibility | /4 |
| Essay: Communication | ▪ Consistently communicates clearly, concisely, accurately and coherently with vitality, maturity of expression and a confident and distinctive voice  ▪ Demonstrates strong sense of direction and purpose; paragraphs linked; outstanding introduction and conclusion  ▪ All paragraphs are well-constructed, with very few or no grammatical or spelling errors  ▪ Always uses technical terminology appropriately and correctly | ▪ Generally communicates clearly, logically and accurately with maturity of expression and a confident voice  ▪ Demonstrates clear sense of direction and purpose; paragraphs linked; effective introduction and conclusion  ▪ Most paragraphs are well-constructed, with few grammatical or spelling errors  ▪ Mostly uses technical terminology appropriately and correctly | ▪ Generally communicates clearly  ▪ Demonstrates sense of direction and purpose; paragraphs linked; introduction and conclusion linked to question  ▪ Paragraphs are generally satisfactorily-constructed, with some significant grammatical or spelling errors  ▪ Often uses technical terminology inappropriately and/or incorrectly | ▪ Often communicates without clarity  ▪ Demonstrates partial grasp of essay structure  ▪ Paragraphs are generally poorly-constructed, with many grammatical and spelling errors  ▪ Occasionally uses technical terminology appropriately and/or correctly | ▪ Consistently communicates without clarity  ▪ Experiences difficulty with essay structure  ▪ Paragraphs are generally poorly-constructed, with many grammatical and spelling errors  ▪ Never uses technical terminology appropriately and/or correctly | /5 |
| **TOTAL MARK** | | | | | | **/52** |