

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Common Assessment Criteria Applied	Marks available	Marks awarded
1. Research-informed Literature Extent of research and/or own reading; selection of credible sources; application of appropriate referencing conventions.	10	4
SATISFACTORY		
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline	25	10
SATISFACTORY		
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	25	10
SATISFACTORY		
4. Practical Application and Deployment Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.	30	12
SATISFACTORY		
5. Skills for Professional Practice Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation.	10	5
GOOD		

Assignment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		41 %
	Up to four weeks late		
	First Attempt?	✓	

FdSc & HN COMMON ASSESSMENT AND MARKING CRITERIA

	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
Assessment Criteria	REFER (equivalent to 0-20%)	REFER (equivalent to 20-39%)	PASS (equivalent to 40-49%)	PASS (equivalent to 50-59%)	MERIT (equivalent to 60-69%)	DISTINCTION (equivalent to 70-79%)	DISTINCTION (equivalent to 80-100%)
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research-informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupportable/missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant.	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant.	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions.
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence.	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	Can communicate effectively in a suitable format, but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure.	Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.

Programmable logic controllers assignment 2

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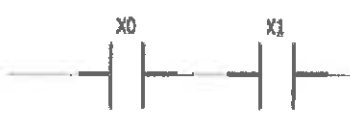
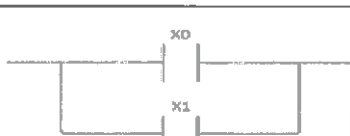
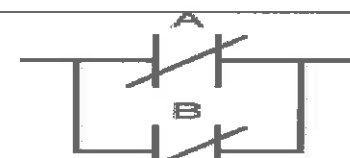
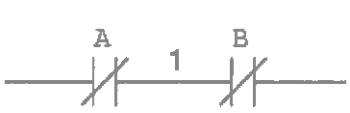
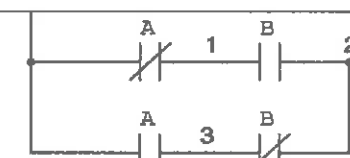
Module code – PDSE4005

Summary

Firstly, throughout this assignment the user will be required to spend a lot of time using ladder logic software. This assignment is made up of 4 different tasks needed to be completed, the first task requires the user to show their understanding of different types of logic functions that are going to be used throughout the assignment, along with instruction lists. The second task requires the user to show their ability to convert function block diagrams > ladder logic diagrams > instruction lists and vice versa. The third task requires the user to demonstrate their ability to create programs using the ladder logic software, the programs required to design are: a washing machine cycle, a photocell sensor and pneumatic power press. Lastly, the fourth task requires the user to design a more complex program – a conveyor belt sorting system, in each of the programs in task 3 and 4 they will all have specific requirements that they need to meet to work correctly.

Task 1

This task is to simply create and demonstrate the various ladder logic functions that will be used throughout this assignment, all of these will be created using the ladder logic software. Below is a 3x6 table including screenshots of each logic functions, the name of them and the instruction lists to go with them. Getting a good understanding on how logic functions are used allows the user to create programs such as a working washing machine cycle less complicated so it is pivotal that the user understands each of these.

Logic functions	Diagrams	Instructions lists
AND		LD AND
OR		LD OR
NAND		LDI ORI
NOR		LDI ANI
XOR		LDI AND OR ANI

Task 2

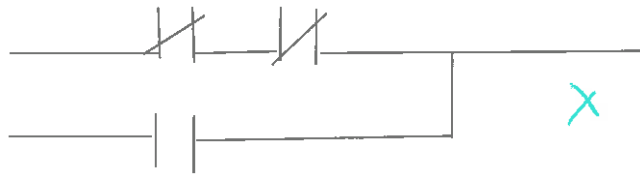
This task requires the user to convert function block diagrams shown in the assignment to ladder logic, these need to have instruction lists to go with each of them. To create the ladder logic and instruction lists to go with them the user should have an understanding on how to use the ladder logic software and what instruction lists are. Links below are very useful for this.

<https://library.automationdirect.com/ladder-logic-instructions-the-basics/>

<https://www.wisdomjobs.com/e-university/programmable-logic-controllers-tutorial-523/instruction-lists-14693.html>

SDP

i)



Steps	Instruction lists
0	LDI
1	ANI
2	OR
3	OUT

ii)



Steps	Instruction lists
0	LD
1	AND
2	OR
3	ANI
4	AND
5	ANI
6	OUT

b) Part b of task 2 requires the user to use the instruction lists provided in the assignment and produce ladder logic diagrams and function block diagrams. To be able to create this the user must be able to analyse the instruction lists correctly to ensure that the outcome of the diagrams are correct to the lists provided.

LD X400 ANI X401 LDI 400 AND X401 OUT Y430 END		
LD X400 ANI X401 OUT Y430 LDI X402 AND X403 OUT Y431 LD X404 ORI X405 OUT Y432		

In order for the table above to be completed correctly the user must have a good understanding of what each instruction meant to understand which switch you should add to the ladder diagrams and what logic controller was needed within the function block diagram.

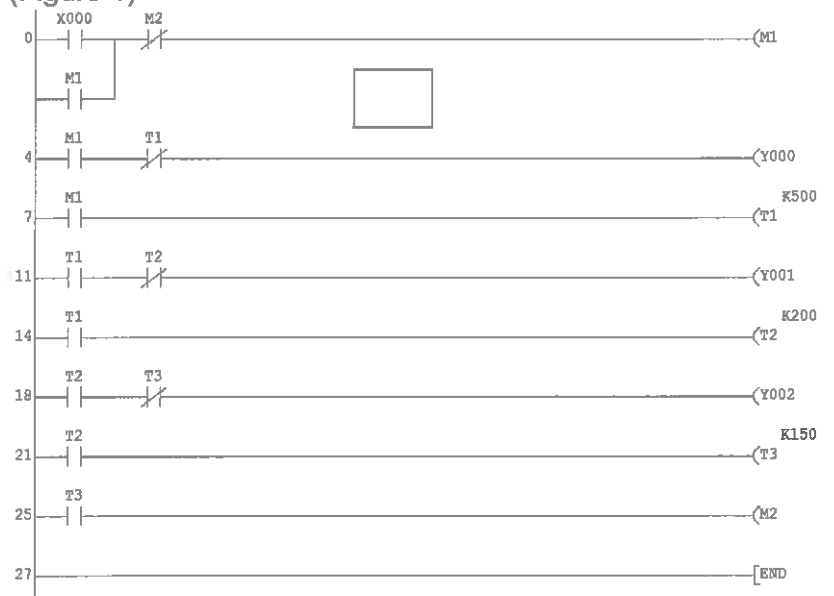
Task 3

To complete task 3 the user will have to design each of the programs required using the ladder logic design software, all three have different specifications to meet to be complete correctly.

a) Washing machine

For the washing machine to meet the correct specifications it must run through a water cycle, heater a drain pump at the correct timing. The cycle will start using a momentary ON switch, the reason this type of switch is used is because the program must be able to run exactly the same as a washing machine normally would – the switch must be pressed ON to activate the cycle again. The time frames for the cycle to work correctly must be as followed – the water supply pump must turn on and stay on for 50 seconds, the heater must then turn on and stay on for 20 seconds, to end the cycle the drain pump must turn on and stay on for 15 seconds and the cycle if then complete.

(Figure 1)

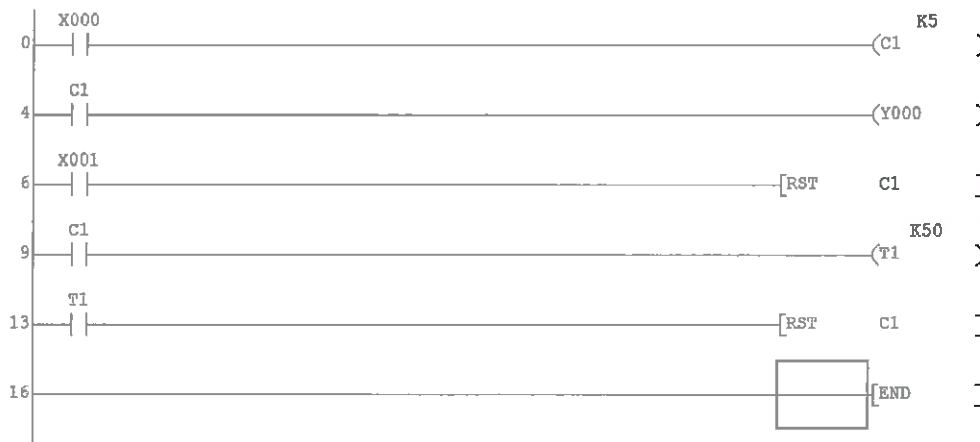


Program not tested.

b) Photocell sensor

This cycle requires a reset after a specific amount of inputs and also an automatic reset. To meet the specifications required the cycle must reset after 10 inputs have been made, before the cycle can be reset there is a timer to ensure that the cycle resets correctly. The automatic reset option is labelled X002 in figure 2, once the timer is complete and the cycle is reset the cycle will then be ready for use again.

(Figure 2)

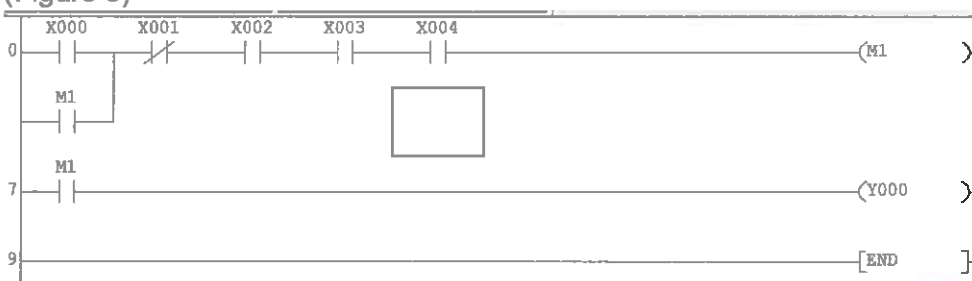


Program not tested

c) Pneumatic power press

For the power press to start the motor needs 3 switches to all be on at the same time, this is so that it has a control system to start and stop the cycle, also for safety reasons – the motor shouldn't start unless the 3 interlock switches are made.

(Figure 3)



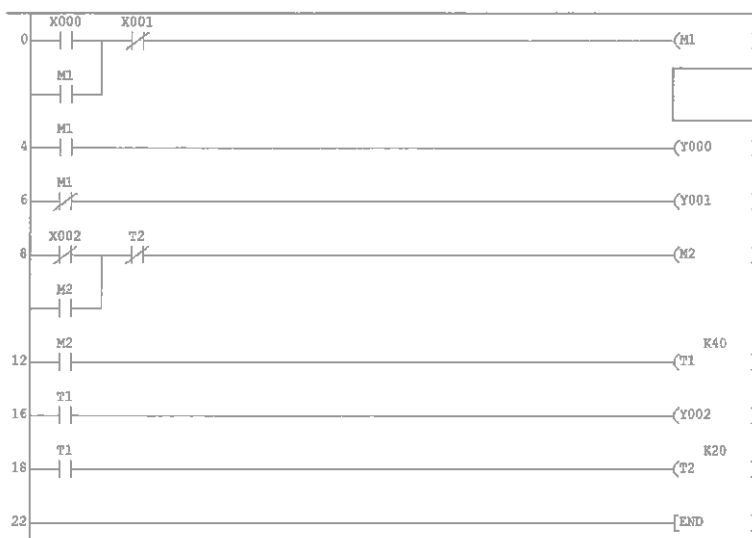
Program not tested

Task 4 – Conveyor belt component sorting system

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Out of the previous 3 programs the conveyor belt is the more complex one, the requirements for this to work correctly are: the cycle must only run once there is an input, it should remain off unless there is an input, the program should be able to detect the height of the object and give off a green light if the object is to the correct measurements and there should also be a maximum of 5 objects allowed on the conveyor belt at one time. The cycle should be able to be stopped by using a STOP button or if there are a maximum of 5 objects at one time.

(Figure 4)



Not complete

/SDP

Bibliography

<https://library.automationdirect.com/ladder-logic-instructions-the-basics/>

<https://www.wisdomjobs.com/e-university/programmable-logic-controllers-tutorial-523/instruction-lists-14693.html>

