

THE程V序域写代做 CS编程辅导



Semester 2 - Main, 2022

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EXAM WRITING TIME: 3 hours READING TIMASSI GIPPING PROJECT Exam Help

EXAM CONDITIONS:

This is an OPEN book examination. You are allowed to use passive information sources (i.e., existing witten inderest cuch as books and websites); however, you must not ask other people for answers or post questions on forums; always answer in your own words. You must not reveal the questions to anyone else. All work must be individually reproduce with the University's "Academic Dishonesty and Plagiarism" policies.

- 1. Type your answers in your text editor and submit a **single PDF** via Canvas; all prose must be typed. Figures/diagrams can be rendered any way you like (hand drawn, latex, etc), as long as they are perfectly readable and part of the submitted PDF.
- 2. Start by typing your student ID at the top of the first page of your submission. Do **not** type your name.
- 3. Submit only your answers to the questions. Do **not** copy the questions.
- 4. Start each of the five problems on a new page.
- 5. If the required level of justification is not stated, you should briefly justify your answer.

For examiner use only:

Problem	1	2	3	4	5	Total
Marks						
Out of	12	14	12	6	6	50

Problem 1. These questions are soout Regular CS finger Thin are worth a total of 12 marks. If the required level of justification is not stated, you should briefly justify your answer.

- a) Show that expressions then there is a regular expression [2 marks] for $L(S) \cap$
- b) Give an National age of strings over alphabet 0,1 that have 001 [2 marks] as a substitute with the NFA or type the transition relation. No additional ded.
- c) Give a regular expression for the language $\{w \in \{0,1\}^* : w \neq 01\}$. No [4 marks] additional explanation is needed.
- d) Fix $\Sigma = \{0, v\}$. Consider the operation A and A and A is regular then A and A is regular then A if A is regular then A is A in A is A in A is A in A in

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Problem 2. These questions are sout Turns Machine and Camplesity. They are worth a total of 14 marks. If the required level of justification is not stated, you should briefly justify your answer. If you are describing a TM, give a high-level description specified.

- a) Let M be a substitution alphabet $\{0,1\}$. Give a high-level description [4 marks] of a TM the substitution $L(M) \cap L(0^*)$.
- b) Explain w ble languages are closed under complement. [2 marks]
- c) We know L_1, L_2 are [4 marks] context-free languages, then $L_1 \cap L_2$ is in **P**.
- d) Fix $\Sigma = \{0,1\}$. Consider the operation del that maps a string u to the string in which every C decrease. So St. Utlones del(01101) = 111, del(1) = 1, and $del(\epsilon) = \epsilon$. For a language $L \subseteq \Sigma^*$, let $del(L) = \{del(u) : u \in L\}$. Show that if L is decidable, then del(L) is recognisable.

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Problem 3. These questions are soout Propositional English and worth a total of 12 marks. If the required level of justification is not stated, you should briefly justify your answer.

- a) Are the formula $y \lor p$ logically equivalent? Give a short explanation p and p and p are the formula p and p are the formula p and p are the formula p are the formula p and p are the formula p are the
- b) Using the **Lieuwist in Trans** rom the Table provided with the exam, show [2 marks] that $((A \land A) \land A)$.
- d) Write a CNF formula over variables p,q,r that says that the number of true [2 marks] variables is even No additional syllimits [5] needed.
- e) Prove the following in Natural Deduction:

[4 marks]

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Type your answer in a table or as a sequence of lines. No marks will be awarded for proofs that do not use the rules taught in this course and summarised in the Table bladification the example.

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Problem 4. Thest questions tre Dout Predicates of 6 marks. If the required level of justification is not stated, you should briefly justify your answer

- [oS] domain, that includes the UoS COMP2022, [4 marks] a) Consider t ongst others), and the following predicates: COMP2922
 - binary predicate expressing that x is a pre-
 - inary predicate saying that x is a prohibition 2. prohi of y.

Use this to write the following statements in predicate logic:

- 1. COMP292 Caprination GStOWE OICS
- 2. Every UoS that is a pre-requisite for COMP2022 is also a pre-requisite for COMP2922.
- 3. INFO140 SSIgnment Project Exam Help
- 4. If two UoS have the same pre-requisites then they have the same pro-No additional explanation is needed. @ 163.com

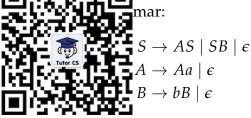
b) Prove the following in Natural Deduction:

[2 marks]

Type your answer in a table or as a sequence of lines. No marks will be awarded for the that the course and summarised in the Table provided with the exam.

Problem 5. These questions are Sout Context-cres from the state of the

a) Consider



Describe the language of the grammar, and show that the grammar is ambiguous.

b) Fix $\Sigma = \{0, 1\}$. Crevitation textitud graphical for the language

[2 marks]

[4 marks]

 ${u0v1w : |v| = |u| + |w|}$

For instance, taking unent_Project Exam Help 0101100111 is in the language. No additional explanation is needed.

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