

Department of Computer Science, N.U.I. Maynooth

CS151 – Discrete Structures 1

Class Test 2

Thursday 27 October 2005, 17:00

Instructions:

1. Remove all notes, books, blank paper, and electronic devices from your desk. Blank paper will be provided if you need it.
2. Write your name, student number, and course below
3. Write yes or no in each of the spaces provided (check both sides of page)
4. You have 30 minutes for this test. Hand this script to the invigilator before you leave and make sure to sign the attendance sheet when you do so. This will verify that you actually handed up a script if for some reason it goes missing.

Name: \_\_\_\_\_

Student number: \_\_\_\_\_

Course (Arts, CSSE, Finance, Venture Mgt., Music Tech., etc.): \_\_\_\_\_

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Let  $A = \{a, b, \emptyset, \{a, b\}\}$ . State whether each of the following statements are true or false. The operation  $2^A$  is the same as  $\text{power}(A)$ . **[1 mark for each of Q1 – Q7]**

- |    |                               |               |
|----|-------------------------------|---------------|
| 1. | $\emptyset \in A$             | Answer: _____ |
| 2. | $\{a\} \subset A$             | Answer: _____ |
| 3. | $\{a, b\} \subset A$          | Answer: _____ |
| 4. | $\emptyset \in 2^A$           | Answer: _____ |
| 5. | $\{\emptyset\} \in 2^A$       | Answer: _____ |
| 6. | $\{\{a, b\}\} \subset 2^A$    | Answer: _____ |
| 7. | $\{\{a\}, \{a, b\}\} \in 2^A$ | Answer: _____ |

8. Prove that  $A = \{x : x \text{ is a vowel}\}$  is a subset of  $B = \{x : x \text{ is a letter that appears in a girl's name}\}$ . A vowel is a letter from the set  $\{a, e, i, o, u\}$ . **[3 marks]**

9. Prove that  $B$  is not a subset of  $A$ . **[3 marks]**

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You should use the remainder of this page for your answers to Q8 and Q9