BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF EDUCATIONAL TECHNOLOGY

BACHELOR OF SCIENCE EDUCATION IN COMPUTER SCIENCE

EDT112: HISTORY AND PHILOSOPHY OF COMPUTER SCIENCE

TIME: 3 HOURS

INSTRUCTIONS

JAN 2025

Answer **ALL the questions.** Each question carries **20** marks.
The question paper has **five** questions
Multiple Choice questions are **one mark each** and have **NO** part marks

Question 1

i. These computers moved from cryptic binary machine language to symbolic, or assembly language, which allowed programmers to specify instructions in words
   a) First generation computers
   b) Second generation computers
   c) Third generation computers
   d) Fourth generation computers

ii. Which was the first Electronics digital programmable computing device?
   a) Analytical Engine b) Difference Engine
   c) Colossus d) ENIAC

iii. EDVAC stands for
   a) Electronic discrete variable automatic calculator
   b) Electronic discrete variable automatic computer
   c) Electronic data variable automatic calculator
   d) Electronic data variable automatic computer

iv. Which Electronic components are used in fourth Generation Computers?
   a) Transistors b) Integrated Circuits
   c) Vacuum Tubes d) VLSI

v. Which language used in first Generation computers?
   a) Machine language b) Assembly language
   c) High level language d) BASIC

vi. Write 'T' for true and 'F' for false statements. **[1 mark each]**

   a. Herman Hollerith invented 'Tabulating machine' in 1990.

b. Mark I was the first electro-mechanical computer.

c. The First Generation computers did not produce a lot of heat.

d. The Third Generation of computers used vacuum tubes.

e. Integrated Circuit was used in the Fourth generation of computers.

vii. Explain **ALL** the following kinds of logical rationality **[2 ½ marks each]**

a. Deductive Logic
b. Inductive Logic
c. Abductive Logic
d. Non-Monotonic Logic

Question 2

i. What do computers Science and Philosophy have in common **[5]**

ii. Another academic purpose for asking what computer science is concerns pedagogy. Give **any four** questions that one would ask from a pedagogical perspective of computer Science **[5]**

iii. Explain the **five** characteristics the informal, intuitive notion of "algorithm" as given by Knuth **[10]**

Question 3

What is Computer Science? **[20]**

Question 4

Evaluate the following argument:

1. A special-purpose computer (that is, a computer that does just one task) is essentially a hardwired computer program.
2. Such a hardwired computer program is a physical machine.
3. Physical machines can be patented.
4. Therefore, such a hardwired computer program can be patented.
5. The printed text of a computer program is a "literary work" (that is, a piece of writing) in the sense of the copyright law.
6. Literary works can be copyrighted.
7. Therefore, such a computer program can be copyrighted.
8. Nothing can be both patented and copyrighted.
   - Note: This premise is a matter of law. You must accept it as true. But you can argue that the law should be changed.
9. There is no computational or other relevant difference between the hardwired computer program and its textual counterpart (except for the different media in which they are implemented, one being hardwired and the other being written on, say, a piece of paper).
10. Therefore, computer programs can be both patented and copyrighted.

a. To evaluate this argument, you must state whether the argument is valid and you must state whether and why you agree or disagree with each premise. This means, of course, that you have to evaluate each premise and each (sub) argument. **[15]**
b. In addition evaluate the conclusion independently of whether you think that it follows validly or doesn't follow validly from its premises. **[5]**

Question 5

Evaluate the following argument:

Suppose that computers running certain computer programs can make rational decisions (at least in the sense of outputting values of functions that serve as a basis for decision making). That is, suppose that they can determine the validity of arguments and ascertain the probable truth-values of the premises of the arguments, and that they can consider the relative advantages and disadvantages of different courses of action, in order to determine the best possible choices. (For example, there are computers and computer programs that can diagnose certain diseases and (presumably) recommend appropriate medical treatments; there are computers and computer programs that can prove and verify proofs of mathematical theorems; and there are computers and computer programs that can play winning chess.) Suppose for the sake of argument that some of these computers and computer programs can make decisions (and recommendations) on certain important matters concerning human welfare. Suppose further that they can regularly make better recommendations than human experts on these matters. Therefore, these computers should make decisions on these important matters concerning human welfare. **[20]**

THE END OF EXAMINATION PAPER