**YSGOL CYFRIFIADUREG A
PHEIRIANNEG ELECTRONIG
SCHOOL OF COMPUTER SCIENCE
AND ELECTRONIC ENGINEERING**

COMPUTER SCIENCE

Entrance Scholarship

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Answer all questions.

**Cyfanswm Marciau 100
Total marks 100**

COMPUTER SCIENCE: Entrance Scholarship

Answer **ALL** questions (Total marks 100)

1. Describe two features of an integrated development environment (IDE) that assist with the writing and editing of code. [5]

2. Describe the difference between high and low-level programming languages. [5]

3. Explain the difference between Agile and Waterfall approaches to software development. [5]

4. What is the purpose of DNS in a network? How does it help? [5]

5. What is the difference between HTTP and HTTPS as used on the World Wide Web? [5]

6. You have a list of 50 numbers to operate on in a computer program. Name one way that they can all be stored in a single variable. Give an advantage and disadvantage of this approach. [5]

7. Describe the Linked List data structure. Draw a suitable diagram to illustrate your answer. [5]

8. Describe how the Insertion Sort algorithm works. You can use diagrams to aid your answer. [5]

9. System CPUs (Control Processing Units) have an address, data, and control bus for dealing with the rest of the system. Describe what each of these three busses do. [5]

10. Describe a multi-core processor, how does it differ from a single-core processor? What kind of applications can benefit from multiple cores? [5]

11. Define what is meant by the term data mining. Describe two examples of how an organisation might use data mining techniques [5]

12. Using pseudo-code or a high-level language of your choice, write a program that checks if a number entered is even or odd. [5]

13. The University currently uses an ID card system to control access to its premises. This has proven problematic with students and staff damaging, swapping or losing cards. The University wishes to use a facial recognition system in its place. Describe how you design a system like this, and explain the strengths and weaknesses of using a biometric system for this purpose. [10]

14. Artificial Intelligence is advanced rapidly. Write a short essay explaining how you think this technology will impact humanity over the next ten years. [30]