Year 11 Computer Science Revision Topic Checklist

1.1 Systems Architecture
- Von Neumann Architecture
- Common CPU Components & Function
- Fetch Execute Cycle
- Characteristics of CPU and how they affect performance
- Embedded Systems

1.2 Memory
- Difference between RAM and ROM
- Purpose of ROM

1.3 Storage
- The need for secondary storage
- Common types of storage
- Suitable storage devices for a given application and the advantages/disadvantages of each.

1.4 Wired and Wireless Networks
- Types of networks (LAN, WAN)
- Factors that affect network performance
- The different roles of a computer in client-server or peer-to-peer networks
- The hardware needed to connect standalone PCs into a LAN
- The internet as a worldwide collection of computer networks
- The concept of virtual networks

1.5 Network Topologies, Protocols and Layers
- Star and mesh network topologies
- Wi-Fi
- Ethernet
- Encryption
- The uses of IP addressing, MAC addressing and protocols (HTTP, HTTPS, FTP, POP etc…)

1.6 System Security
- Forms of Attack
- Threats posed to networks
- Identifying and preventing

1.7 Systems software
- The purpose and functionality of systems software
- Operating Systems
- Utility System Software

1.8 Ethical, Legal, Cultural and Environmental concerns
- Privacy issues
- How stakeholders are affected by technologies
- Cultural implications of computer science
- Open source vs. proprietary software
- Legislation relevant to computer science

PAPER 2

2.1 Algorithms
- Computational Thinking
- Standard Searching Algorithms
- Standard Sorting Algorithms
- How to produce algorithms using:
    - Pseudocode
    - Flow diagrams

- Interpret, correct or complete algorithms

2.2 Programming Techniques
- The use of variables, constants, operators, inputs, outputs and assignments
- The use of:
    - Sequence
    - Selection
    - Iteration

- The use of basic string manipulation
- The use of basic file handling operations
- The use of record to store data
- The use of SQL to search for data
- The use of arrays when solving problems (1&2 dimensional)
- How to use sub programs
- The use of data types
- Common arithmetic operators
- Common Boolean operators

2.3 Producing Robust Programs
- Defensive design considerations
- Maintainability
- The purpose of testing
- Types of testing
- How to identify syntax and logic errors
- Selecting and using suitable test data

2.4 Computational Logic
- Why data is represented in binary form
- Simple logic diagrams using AND, OR, NOT
- Truth tables
- Combining Boolean operators using AND, OR and NOT to 2 levels
- Applying logical operators in truth tables to solve problems
- Applying computing related mathematics

2.5 Translators and Facilities of Languages
- Characteristics and purpose of different levels of programming language (incl. low level)
- The purpose of translators
- The characteristics of an assembler, compiler and interpreter
- Common tools and facilities available in an integrated development environment (IDE)

2.6 Data Representation
- Units (bit, byte etc.…)
- Number conversion denary, binary and hexadecimal
- Characters in binary, character sets (ASCII, extended ASCII and Unicode)
- Images (pixels as binary, metadata, depth of colour & resolution)
- Sound (sampling, bit rate, frequency etc…)
- Compression (lossy & lossless)