Subject: Computer Science

Year: 10

Paper 1 Topic 1 – Systems Architecture **Paper 1 Topic – 2 Memory and Storage** • The purpose of the CPU - the fetch—execute cycle • Common CPU components and their function: • ALU • CU • Cache • Registers • Von Neumann Architecture • MAR • MDR • Program Counter • Accumulator	**Paper 1 Topic – 2 Memory and Storage (continued)** **Paper 2 Topic 2 - Programming Fundamentals** • Secondary Storage • Types of storage such as Optical, Magnetic and Solid State • Advantages/disadvantages such as capacity, speed, portability, durability, reliability, and cost • Suitable storage for different	**Paper 1 Topic 3 – Networks, connections and protocols** **Paper 2 Topic 2 - Programming Fundamentals** • Types of networks • LAN • WAN • Factors which impact the performance of networks • Client-Server and P2P networks • Hardware needed to create a network • Wireless access points • Routers • Switches • NICs	**Paper 1 Topics 4 – Threats to computer systems and networks** **Paper 2 Topic 1 - Algorithms** • Forms of attack • Malware • Social engineering • Brute-force • DoS attacks • Data Interception • SQL Injection • • Common prevention methods • Penetration testing • Anti-malware software • Firewalls • User Access levels	**Paper 1 Topic 5 – System Software** **Paper 2 Topic 2 – Programming Fundamentals** **Paper 2 – Topic 5 – Programming languages and IDEs** • Purpose and functionality of operating systems • Memory management • User interface • Peripheral management • User management • File management • Utility software	**Paper 1 Topic 6 – Ethical, legal, cultural and environmental impact** • Ethical, Legal, Cultural and Environmental Issues in Computing • Legislation • Ethics, Culture and Privacy • Environmental Issues • Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • Software licences (i.e., open source

• CPU Performance • Clock speed • Cache size • Number of cores • Embedded Systems • Purpose • Examples • • • Paper 1 – Topic 2 • • Primary Storage • Difference between RAM and ROM • Purpose of ROM in a computer system • Purpose of RAM in a computer system • Virtual Memory • Units of measurement	applications (essay) • • Data Storage • How data needs to be converted to binary • Converting between denary and 8 bit binary • Adding to 8-bit binary values together • Knowledge of overflow errors • Converting between denary and hexadecimal • Converting between binary and hexadecimal • Binary shifts • Characters • The use of binary codes	• Transmission Media • The Internet and WWW • DNS • Hosting • The Cloud • Web servers and clients • Topologies • Star • Mesh • Modes of connection such as wired, and wireless networks • Encryption • IP Addressing and MAC addressing • Standards • Common Protocols • TCP/IP • HTTP • HTTPS • FTP • POP • IMAP • SMTP	• Passwords • Encryption • Physical Security • • Paper Two – Algorithms • Using abstraction, decomposition and algorithmic thinking • Creating pseudocode, flowcharts • Common errors • Trace tables • Searching and sorting algorithms • Binary search • Linear search • Bubble sort • Merge sort • Insertion sort	• Uses of utility software • Encryption • Defragmentation • Data compression • • Paper 2 Topic 2 • Use all the skills learnt to produce various programming solutions to given problems • Develop skills further and consider the user of different programming languages – as required. • Paper 2 Topic 5 • Characteristics of high and low level	and proprietary)

○ Bit ○ Nibble ○ Byte ○ Kilobyte ○ Megabyte ○ Gigabyte ○ Terabyte ○ Petabyte • Converting data/capacity requirements	to represent characters • What is a character set? • Bits per character and the number of characters which can be represented. E.g., ASCII and Unicode • • Images • How an image is represented as pixels which is made up of binary • Metadata • Colour depth and resolution and how it impacts quality and file size • Sound • How can sound be	• The concept of network layers **<u>Paper 2 Topic 2</u>** • Continue with programming techniques • File handling • Use of records • SQL • Arrays • Sub programs • Generating random numbers		programming languages • Purpose of translators • Characteristics of a complier and interpreter • IDEs and their features • Editors • Error diagnostics • Run-time environment • Translators	

	sampled and stored digitally • Sample rate • Duration • Bit depth • Quality and file size • Programming Techniques • Data Types • Integer • Real • Boolean • Character and string • Casting • Creating basic programs using various functions such as INPUT and PRINT • Use of assignments • Using Sequencing, selection and iteration				

	• Use of different operators • Use of basic libraries				