Exam 1: 1h 30 mins

1.1 Systems Architecture

Topic			
1. The purpose of the CPU			
2. Von Neumann architecture			
MAR (Memory Address Register)			
MDR (Memory Data Register)			
Program Counter			
Accumulator			
3. Common CPU components and their function:			
ALU (Arithmetic and Logic Unit)			
CU (Control Unit)			
Cache			
4. The FDE Cycle			
5. How common characteristics of CPUs affect their performance:			
Clock speed			
Cache size			
Number of cores			
6. Embedded systems:			
Purpose of embedded systems			
Examples of embedded systems.			

1.2 Memory

Topic			
1. The difference between RAM and ROM			
2. The purpose of ROM in a computer system			
3. The purpose of RAM in a computer system			
4. The need for virtual memory			

1.3 Storage

Topic			
1. The need for secondary storage			
2. Calculation of data capacity requirements			
3. Common types of storage:			
optical			
magnetic			
solid state			
4. Selecting suitable storage using:			
Capacity			
Speed			
Portability			
Durability			
Reliability			
Cost			

1.4 Wired and Wireless Networks

Topic			
1. Types of networks:			
LAN (Local Area Network)			
WAN (Wide Area Network)			
2. Factors that affect the performance of networks			
3. Client-server vs. peer-to-peer network			
4. Local Area Network Hardware:			
Wireless access points			
Routers / Switches			
NIC (Network Interface Controller / Card)			
Transmission media			
5. The internet:			
DNS (Domain Name System)			
Hosting			
The Cloud			
6. The concept of virtual networks.			

1.8 Ethical, legal, cultural and environmental concerns

Topic			
1. Investigate and discuss technologies while considering:			
Ethical issues			
Legal issues			
Cultural issues			
Environmental issues			
Privacy issues			
2. Stakeholders			
3. Open source vs. proprietary software			
4. Legislation relevant to Computer Science:			
The Data Protection Act 1998			
Computer Misuse Act 1990			
Copyright Designs and Patents Act 1988			
Creative Commons Licensing			
Freedom of Information Act 2000			

1.5 Topologies, protocols and layers

Topic			
1. Star and mesh network topologies			
2. Wifi:			
frequency and channels			
encryption			
3. Ethernet			
4. The uses of IP, MAC and protocols:			
TCP/IP			
HTTP			
HTTPS			
FTP			
POP			
IMAP			
SMTP			
5. The concept of layers			
6. Packet switching			

1.7 Systems Software

Topic			
1. The purpose of systems software			
2. Operating systems:			
User interface			
Memory management / multitasking			
Peripheral management and drivers			
User management			
File management			
3. Utility system software			
Encryption software			
Defragmentation			
Data compression			
The role and methods of backup:			
full			
incremental			

1.6 System Security

Topic			
1. Forms of attack			
2. Threats posed to networks:			
Malware			
Phishing			
Social engineering			
Brute force attacks			
Denial of service attacks			
Data interception/theft			
SQL injection			
Poor network policy			
3. Preventing vulnerabilities:			
Penetration testing			
Network forensics			
Network policies			
Anti-malware software			
Firewalls			
User access levels			
Passwords			
Encryption			

I can.
I will.
End of story.