HARDWARE PAPER 1

Section A

1) What is the difference between primary and secondary memory?
2) Define random access memory (RAM).
3) Describe the function of read-only memory (ROM).
4) Explain the purpose of a memory cache in a computer system.
5) Differentiate between Dynamic RAM (DRAM) and Static RAM (SRAM).
6) What is the importance of refreshing in DRAM?
7) What is the primary role of secondary storage devices?
8) Explain the difference between volatile and non-volatile memory.
9) List two examples of primary storage.
10) Describe two advantages of solid-state drives (SSDs) over hard disk drives (HDDs).
11) What is an EEPROM?
12) Compare the functionalities of PROM and EPROM.
13) Explain how cloud storage differs from traditional external storage devices.
14) What is meant by the term "latency" in the context of hard drives?
15) Define the term "fragmentation" with respect to storage devices.
16) Explain the role of removable storage devices in disaster recovery.
17) How do optical storage devices like DVDs and CDs function?
18) What is the purpose of an ADC (Analog to Digital Converter)?
19) How does a DAC (Digital to Analog Converter) work?
20) Define the concept of "bit depth" in data storage.
21) Why is RAM considered volatile, while ROM is not?
22) What is the significance of access time in memory operations?
23) How does increasing RAM affect system performance?
24) Explain the process of writing data to an EEPROM.
25) Describe the structure of a flash memory device.
26) What is meant by the term "data transfer rate"?
27) Explain the concept of "write cycles" in flash memory.
28) What is the function of a memory controller?
29) How does a touch screen work using resistive technology?
30) What is the key difference between capacitive and resistive touch screen technologies?
31) Describe the purpose of a memory hierarchy.

32)What is the role of firmware in embedded systems?
33)How does an inkjet printer differ from a laser printer?
34)What are the advantages of using a 3D printer in manufacturing?
35)Explain the concept of "buffering" in the context of printing devices.
36)What is the main function of a sensor in a monitoring system?
37)Define the term "removable hard drive."
38)Explain the concept of virtual reality (VR) headsets.
39)Describe the differences between OLED and QLED display technologies.
40)Explain how binder 3D printing works.
41)What is the primary function of a heat sink in a computer system?
42)Describe the process of erasing data from an EPROM.
43)Explain how a microprocessor controls an air conditioning unit in a car.
44)What are the primary functions of input and output devices?
45)How do magnetic storage devices differ from solid-state storage?
46)Explain the role of a light sensor in automated street lighting.
47)Describe the difference between internal and external storage devices.
48)What are the benefits of using a memory cache?
49)How does data access speed differ between SSDs and HDDs?
50)Explain the concept of multi-layer DVDs?

Section B

1) What is the function of a processor in a computer system?
2) Describe the difference between RISC and CISC architectures.
3) What are registers in a processor, and why are they important?
4) Explain the fetch-execute cycle.
5) What are the main functions of the control bus in a computer system?
6) How does an address bus differ from a data bus?
7) Define pipelining in computer architecture.
8) Describe SISD architecture and provide an example.
9) How does SIMD architecture differ from SISD architecture?
10) What is the purpose of massively parallel computers?
11) Define the term "cluster" in the context of parallel processing.
12) How does parallel processing improve computer performance?
13) Explain how interrupts are handled in a CISC processor.
14) What is meant by the Von Neumann bottleneck?
15) Compare and contrast Von Neumann architecture with parallel processing.
16) What is the role of the ALU (Arithmetic Logic Unit) in a processor?
17) How do SIMD processors function in image processing applications?
18) What is a supercomputer, and how does it differ from a cluster computer?
19) Describe the concept of data parallelism in computing.
20) What is the difference between an instruction cycle and a clock cycle?
21) Explain how pipelining can reduce the time taken to execute a series of instructions.
22) What are the key characteristics of RISC processors?
23) How does pipelining improve processor performance in RISC architectures?
24) What are the differences between SIMD and MIMD architectures?
25) Describe the purpose of a data cache in a modern processor.
26) How do registers differ from cache memory in a CPU?
27) Explain the process of instruction decoding in a CPU.
28) What is the role of an instruction register?
29) Define the term "parallelism" in computing and give an example.
30) What are the benefits of using a RISC processor over a CISC processor?

31) What is an operand, and how is it used in a processor?
32) Describe how an instruction fetches and decodes in the CPU pipeline.
33) Explain how pipelining is affected by branching instructions.
34) Define the term "multicore processor."
35) How does increasing the number of cores in a CPU affect its performance?
36) What is the importance of instruction-level parallelism?
37) Describe the concept of superscalar architecture.
38) How does cache memory help reduce latency in memory access?
39) What is the purpose of SIMD in modern graphics processors?
40) How does a RISC processor handle interrupts compared to a CISC processor?
41) Explain the concept of clock cycles and their role in CPU performance.
42) What are the differences between primary and secondary storage?
43) How does an address bus function in a processor?
44) Define the term "interrupt" in computer systems.
45) What is meant by "instruction set architecture" (ISA)?
46) How do multiprocessor systems differ from single-core systems?
47) Describe the differences between SISD and MIMD architectures.
48) What is a data hazard in pipelining, and how is it resolved?
49) Explain the role of a register in a RISC architecture.
50) How does CISC architecture handle complex instructions?