Department of Computer Systems Engineering,
University of Engineering and Technology, Peshawar,
Pakistan

Midterm Exam (Fall 2022) Paper: CSE-304 Computer Organization and Architecture
Time: 2 Hours Marks: 30

Note: Attempt all questions briefly and precisely on the answer sheet.

Question No. 1 (Marks=5) (CLO-1)

i. What are interrupts? What is the difference between disable interrupts and define priorities interrupts?

ii. How can we extend the 16-bit signed number to a 32-bit signed number? Give examples. What is the range of signed numbers if the number of bits of a word is 32 bits?

Question No. 2 (Marks=5) (CLO-2)

i. What is the purpose of a Program Counter (PC)? How does it work?

ii. What are the steps in the "Instruction Cycle"? What is the role of the "Interrupt Cycle"? Explain it briefly with the help of a flowchart.

Question No. 3 (Marks=5)

i. What is the difference between dedicated and multiplexed bus types?

ii. Consider a hypothetical microprocessor generating a 32-bit address and having a 32-bit data bus. What is the maximum memory address space that the processor can access directly if it is connected to "16-bit memory"?

Question No. 4 (Marks=5)

i. What is structure, and how is it compared with the functionality of the computer architecture?

ii. What is the purpose of the Instruction Register (IR) and Control Unit (CU)?

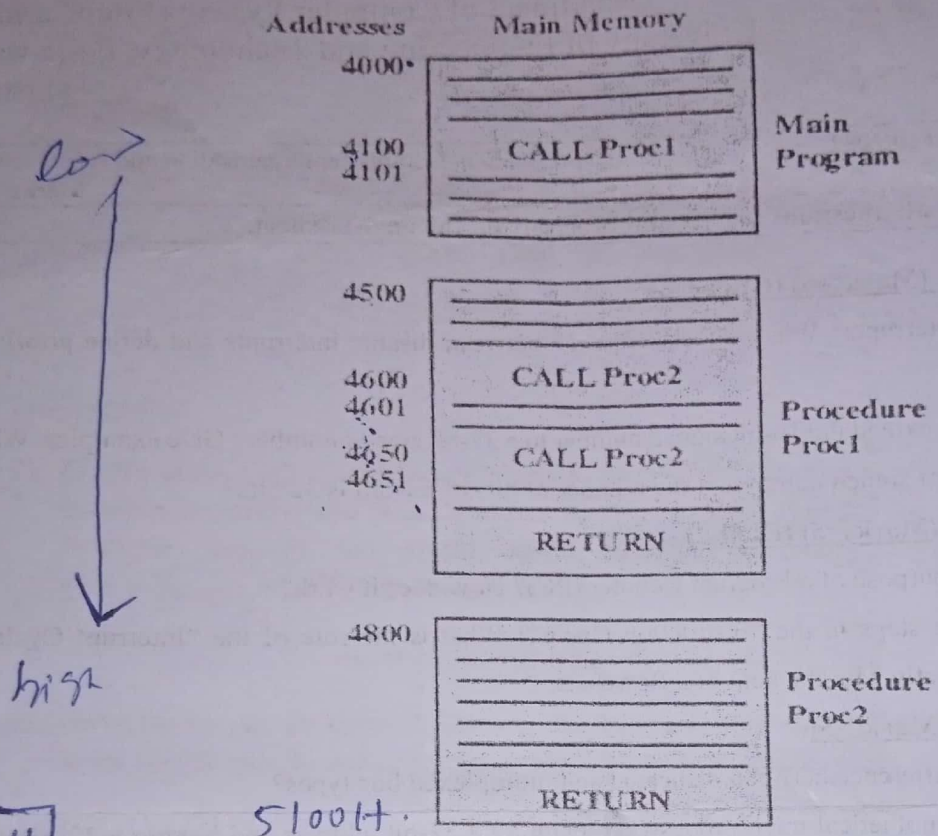
Question No. 5 (Marks=5)

i. What are synchronous and asynchronous systems? Explain it with the help of a diagram.

ii. What architectural features will allow this microprocessor to access separate "I/O devices"?

Question No. 6 (Marks=5)

What will be the contents of the stack and stack pointer for the following scenario shown in the Figure 1? Assume the stack pointer value is 5100H.



(a) Calls and returns

Figure 1