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

Exam: Final term (Fall 2021)	**Time:** 3 Hours
Paper: CSE-304 Computer Organization and Architecture (5th Semester)	**Marks:** 60

Note: Attempt all questions on answer sheet.

Question No. 1 (Marks=10):

i.   What is the difference between Opcode and Operand? Give examples to explain.

ii.   What is the purpose of the Control Sequencer (Control Unit)? And what is the use of 12 bit CON word or sequence?

Question No. 2 (Marks=10)

i.   What do flags represent in computer architecture? Explain at least four flags briefly with examples?

ii.   Briefly explain the "Handshaking" concept?

Question No. 3 (Marks=10)

i.   What is Stack? How is it related to Stack Pointer?

ii.   If the size of the program counter is 16 bits, what can be the maximum size of the memory in computer architecture, provided the data width is 8 bits?

Question No. 4 (Marks=10)

i.   How does the carry bit act as an extension to the arithmetic and logic unit (ALU)? Explain briefly with examples?

ii.   What is the difference between Register-Register instructions and Immediate instructions? Explain briefly with examples?

Question No. 5 (Marks=10)

You have to design instructions for a particular processor, whose characteristics are;
* 16 different operations (ADD, SUB, OUT, HLT etc.)
* 12-bit address (program counter (PC), a memory address register (MAR) etc.)
* 16-bit data registers (accumulators, B, Temp etc.)
* 16-bit instruction register (IR)
    i.   What will be the instruction size?
    ii.   Opcode size?
    iii.   Operand size?
    iv.   A number of locations in memory?
    v.   Memory data size?

Question No. 6 (Marks=10)

Write the sequence of codes for the following flow of code?