COMSATS UNIVERSITY ISLAMABAD, Lahore Campus

Department of Computer Engineering

Subject: Microprocessor Systems and Interfacing (CPE342)		**Batch: FA22-BCE-B**
Assignment No. THREE		**Total Marks: 30**
Handed over on: 5th May 2025	**Submission Date: 12th May 2025 (In class)**	
Student’s Name:		
Registration Number:		

Instructions:

- Provide your solution in the space provided against each problem
- Back side of each leaf is for rough work only
- Submission after the deadline will not be graded
- Do not use lead pencil in your solution

Problem 1 **15 Marks**

Integrate four input and four output ports with 8088 CPU using 74LS138 3x8 line decoder. Port IDs for the input ports are ABC8H, ABC9H, ABCAH and ABCBH and for the output ports are ABCCH, ABCDH, ABCEH and ABCFH. Provide completely labelled schematic diagram.

Problem 2 **15 Marks**

Create an 8086-8088 assembly language code that reads one byte (call it ‘byte0’) from input port 1234H:2300H and one byte (call it ‘byte1’) from CCDDH. The two bytes are to be packed in a word as shown in figure 1. Code is required to push 15000 words onto the stack and the stack starts from 1600H:2400H.

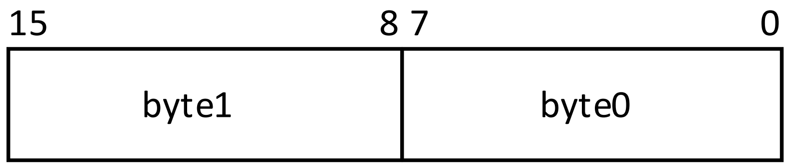
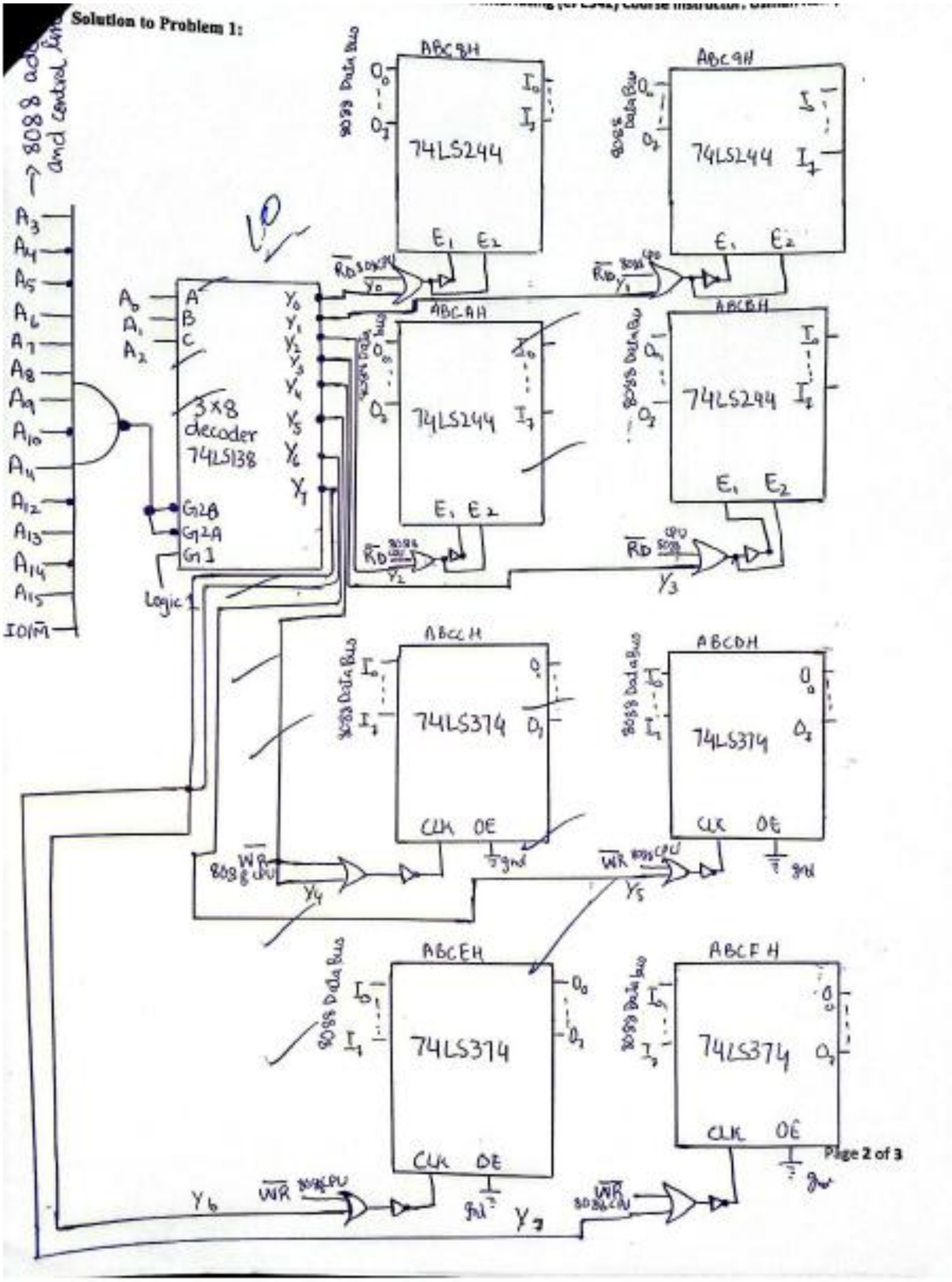


Figure 1

Solution to Problem 1:



Solution to Problem 2:

```
            MOV CX, 15000       ; SET LOOP COUNTER
PUSH_LOOP:

            MOV AX, 1600H       ; SET STACK SEGMENT
            MOV SS, AX
            MOV SP, 2400H       ; SET STACK POINTER
            MOV AX, 1234H       ; SET SEGMENT FOR MEMORY-MAPPED I/O
            MOV DS, AX
            MOV BX, 2300H       ; OFFSET FOR BYTE0
            MOV AL, [BX]        ; READ BYTE0
            MOV BL, AL          ; SAVE BYTE0
            MOV DX, 0CCDDH      ; PORT FOR BYTE1
            IN AL, DX           ; READ BYTE1
            MOV AH, AL          ; MOVE BYTE1 TO HIGH BYTE
            MOV AL, BL          ; MOVE BYTE0 TO LOW BYTE

            PUSH AX             ; PUSH PACKED WORD
            LOOP PUSH_LOOP      ; LOOP UNTIL CX = 0
            HLT                 ; HALT PROGRAM
```