

# International Islamic University Chittagong (IIUC)

## Department of Electronic and Telecommunications Engineering

### Final Examination

Program: B.Sc. (Engg.)  
Course Code: ETE-3523

Semester: Spring 18  
Course Title: Microprocessor  
Microcontroller and Peripherals  
Time: 2 hours 30 minutes

Full Marks: 50

### Group- A

[Answer *any two* sets of the following questions]

1. (a) "MUL is an instruction to multiply data in assembly language programming"- Describe which registers will be used to store the multiplicand, multiplier and the product using an example in each case of the following situations: 05
  - When two bytes are multiplied
  - When two one-word values are multiplied
  - When two double word values are multiplied
- (b) What are the five different groups of 8085 instructions? 02
- (c) Produce an assembly language program to subtract two numbers. 03
  
2. (a) Fig. 1 shows an interfacing circuit using a 3-to-8 decoder to interface the 2732 EPROM memory chip. It is assumed here that the chip has already been programmed. Analyze the interfacing circuit in terms of the three steps for interfacing. Also discuss address decoding and memory addresses for this circuit. 05

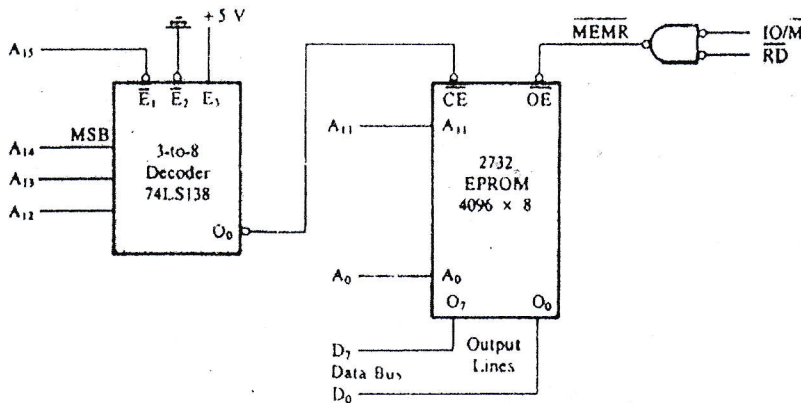


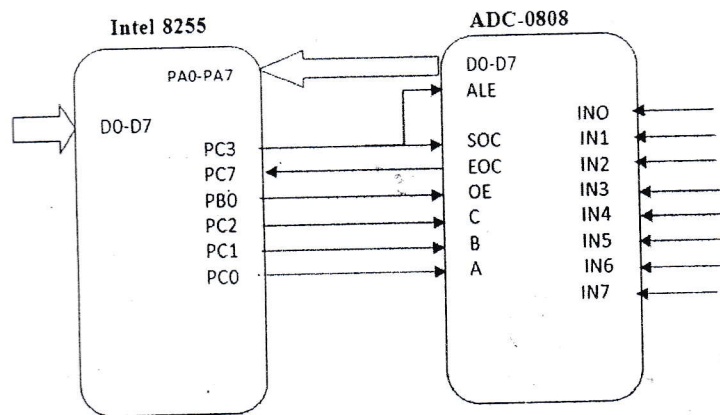
Fig. 1

- (b) Relatively weaker computer system like your smartphone needs memory mapped I/O because of less complexity- Explain in detail 03
- (c) Write short note: 02
  - Memory barriers
  
3. (a) Intel 8255 is a Programmable Peripheral Interface-Enlist its feature. Also describe its Operating mode 0 and Operating mode 1. 2+2
- (b) Chip Select (CS) of Intel 8255 is connected with decoded address while A<sub>0</sub> and A<sub>1</sub> are connected with microprocessor's address line-right? Now show that which combination of values of CS, A<sub>0</sub> and A<sub>1</sub> selects which port of Intel 8255? (show in tabular format) 03
- (c) Why a dollar sign (\$) is used while a string value is assigned to a variable in 16-bit assembly programming? 01
- (d) Describe the purpose of stack operations in assembly programming. 02

## Group- B

[Answer *any three* sets of the following questions]

4. (a) Let following be the block diagram of interfacing of ADC-0808 with intel 8255 PPI. Now compose the control word to push to pins D0-D7 of Intel-8255 to activate the interface between Intel-8255 and ADC-0808 shown in Fig.2.



**Fig. 2**

- (b) How will you select the input line (any of IN0-IN7) of ADC-0808 using pins PC2, PC1, PC0 of 8255 in fig no 01(Show in tabular format)?
- (c) How and which pin is used to collect output from ADC 0808 (in fig no 01)?
5. (a) Intel 8253 has three independent 16-bit counters. Show which combination of values of  $A_0$  and  $A_1$  selects which counter of Intel 8253? (show in tabular format)
- (b) FIFO/Sensor RAM-which actually works as the buffer memory between microprocessor and Intel 8279 programmable keyboard- Could you please describe how microprocessor reads the input from the keyboard with help of FIFO/Sensor RAM?
- (c) Write short note:
- Polled mode (Intel 8279)
  - IRQ (Intel 8279)
6. (a) Describe the roll of DRQ, HRQ, HLDA signals in DMA process.
- (b) Intel 8257 has four channels- What does this mean? Explain
- (c) Define buffer memory. Do you think it helps in I/O operations? How?
- (d) Do you think Direct Memory Access (DMA) is necessary? Why or why not? (Illustrate with a block diagram)
7. (a) Write down the names of the 8085 interrupts? Describe the 8085 non-vectored interrupt process?
- (b) Write short note:
- Programmable logic controller
  - Temperature Controller
- (c) Differentiate intel 8253 and Intel 8254