B.Sc. Engg. / HD CSE 6th Semester — 31 October 2018

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION — **SUMMER SEMESTER, 2017-2018**

DURATION: 3 Hours — **FULL MARKS: 150**

CSE 4619: Peripherals and Interfacing

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **8 (eight)** questions. Answer any **6 (six)** of them.

Figures in the right margin indicate marks.

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1. a) ~~'Microprocessor is generalized and microcontroller is specific' – Explain how.~~ 10
   b) Explain about the handshake signals of 8155 Programmable Peripheral Interface (PPI). 10
   c) Write a short note on 8251 USART interfaces. 5

2. a) What is the naming convention of ATMEL microcontroller? Define and distinguish between Tiny, Mega and XMega AVRs (Advanced Virtual RISC). 10
   b) Draw and explain the timing diagram of 8255 PPI mode 2 signaling. 10
   c) In order to display multiple characters, how can you interface multiple 7-segment display using a single 8255 PPI? Just draw the interfacing diagram. 5

3. a) "Computer revolutions helps for developing modern embedded Systems" – How? 10
   b) Suppose, a control register of 8155 PPI has an address of 1Eh. If following instructions are executed in an 8085 microprocessor system, then derive the all the port functionalities (i.e., including pins) of the 8155 PPI. 10

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MVI A, CDh
OUT 1Eh
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   c) Differentiate between a Computer System and Embedded System. 5

4. a) Explain the role of an Interrupt Controller using a particular PIC example. 10
   b) Differentiate between 8155 and 8255 Programmable Peripheral Interface. 10
   c) Write the taxonomy of models of transfer in Peripherals and Interfacing along with their features. 5

5. a) Draw a block diagram for a DMA controller. How does a DMA controller help to ensure faster processing by the microprocessor? Explain. 10
   b) Write the pros and cons of the *Serial* and *Parallel* interface transmissions. 10
   c) List out the register names of 8237 DMA Controller. 5

6. a) Write short notes on following frames of CAN bus: 10
      i. Remote frame
      ii. Error frame
   b) What is the maximum length of a CAN bus? How can you justify that the maximum length of CAN bus is appropriate? 10
   c) Draw the block diagram of a basic CAN controller. 5

7. a) What do you mean by Wired-AND principle? How does it help for I^2C bus? 10
   b) Why does in I^2C bus the Start-End condition and Data-Transition signaling are opposite to each other? Explain. 10
   c) Draw the data formats of I^2C protocol when the Master IC reads and writes to/from Slave IC. 5

8. a) Write a short note on the Fiber-channel and Infini-band interface. 10
   b) Write a comparative study on USB, Firewire and Bluetooth interfacing techniques. 10
   c) Suppose, in a serial system total 20 frames (each having a size of 5 bytes) need to be transmitted. In case of *asynchronous transmission* 1 byte overhead occurs either for *start* or *stop* byte. In contrast, for *synchronous transmission* 1 byte of synchronization overhead occurs after each 4 frame transmissions. Now, mathematically show the performance efficiency comparison between *Synchronous Transmission* and *Asynchronous Transmission*. 5