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**University of Rajshahi**  
**Department of Computer Science and Engineering**  
**B.Sc. (Engg.) Part-4, Odd Semester, Examination-2020**  
**Course: CSE4141 (Computer Peripherals and Interfacing)**  
**Marks: 52.5 Time: 3:00 Hours**

[N.B. Answer any three questions from each section]

**Section - A**

1. (a) Define computer peripheral interfacing with example. 3  
(b) Compare port-addressed I/O and memory-mapped I/O on basis of address length, control signal, and instruction. 3.75  
(c) In interfacing program, is it possible to write, IN 20H and then OUT 20H? Explain why or why not. 2
2. (a) Distinguish between absolute address decoding and partial address decoding. 3.75  
(b) Discuss how device select pulse is generated prior to transfer data in between processor and I/O devices. 3  
(c) Draw the circuitry to interface eight DIP switches using a 74LS138 decoder and a 74LS244 buffer. 2
3. (a) Discuss how a processor is interfaced with a common anode seven-segment LED using a decoder and a latch. Also write the program to display digit 7 to the output port. 4.75  
(b) Draw an interfacing circuit to design a safety control system for some home appliances using a decoder, a buffer and a latch. Also write the program to operate the controlling system. 4
4. (a) Describe the delay calculation process using register pair. 3  
(b) Discuss 8085 vectored interrupts. 5.75

**Section - B**

5. (a) What do you mean by maskable and nonmaskable interrupts? 2  
(b) Write a main program to count continuously in binary with a one-second delay between each count and write a service routine at XX70 to flash FFH five times when the program is interrupted, with some appropriate delay between each flash. 3  
(c) Write the difference between vectored and non-vectored interrupts. 1.75  
(d) Can a processor be interrupted again before the completion of the first interrupt service routine? Explain why or why not. 2
6. (a) Discuss how an 8-bit A/D converter is interfaced with processor using status check I/O technique. 4  
(b) Design an output port with address FFH to interface the 1408 D/A converter that is calibrated for 0 to 10V range. Write a program to generate a continuous ramp waveform. 4.75
7. (a) Describe the functional diagram of 8257 DMA controller. 4.75  
(b) Draw and discuss the block diagram of 8254 programmable interval timer. 4
8. (a) What is meant by Programmable Peripheral Interfacing (PPI)? 1  
(b) Design a square-wave generator with a pulse width of 100 $\mu$ s by using the 8155 timer. Set up the timer in Mode 1 if the clock frequency is 3 MHz. 3.75  
(c) Interface 8255A ports in mode 0 with processor for the following conditions: 3  
(i) Use port B and port C<sub>L</sub> as input ports to read inputs from DIP switches and port A and port C<sub>U</sub> as output ports to display output at LEDs.  
(ii) Write the program to read the DIP switches and display the reading from port B at port A and from port C<sub>L</sub> at port C<sub>U</sub>.  
(d) Why the BSR mode of 8255A is used? 1

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University of Rajshahi  
Department of Computer Science and Engineering  
B.Sc. (Engg.) Part-4, Odd Semester, Examination-2018  
Course: CSE4141 (Computer Peripherals and Interfacing)  
Marks: 52.5 Time: 3:00 Hours

[N.B. Answer any Six questions taking Three from each section]

**Section-A**

1. (a) What do you mean by computer peripheral interfacing? 2  
(b) Discuss port-addressed I/O and memory-mapped I/O with control signals and instructions. 4.75  
(c) Can it be- IN 30H and then OUT 30H? Explain your answer. 2
2. (a) If the clock frequency is 5 MHz, how much time is required to execute an instruction of 18 T-states? 3  
(b) Discuss how to interface common anode seven-segment LED with 8085 with proper circuit diagram. 3.75  
Also write the program to display sequentially digit 0-9 in the seven-segment LED.  
(c) What happens when a microprocessor is interrupted? 2
3. (a) Draw and discuss the timing-waveform to execute the instruction OUT 01H. 4  
(b) Discuss an interfacing circuit to design a safety control system for home appliances using a decoder, a buffer as an input port and a latch as an output port. Also write the program to operate the controlling system. 4.75
4. (a) Discuss how time delay is calculated using loop within loop technique with a counter value of FFFFH. 4  
(b) Can the microprocessor be interrupted again before the completion of the first interrupt service routine? Explain your answer. 1.75  
(c) Write a main program to count continuously in binary with a one-second delay between each count and write a service routine at XX70 to flash FFH five times when the program is interrupted, with some appropriate delay between each flash. 3

**Section-B**

5. (a) Differentiate the interrupts: (i) maskable and non-maskable (ii) vectored and non-vectored. 4  
(b) Design a 1-minute timer using a 60Hz power line as an interrupting source. The output ports display minutes and seconds in BCD. At the end of the minute, the output ports should continue displaying one minute and zero seconds. 4.75
6. (a) Discuss how an 8-bit A/D converter is interfaced with processor using status check I/O technique. 3.75  
(b) Design an output port with the address FFH to interface the 1408 D/A converter that is calibrated for 0 to 10V range. Write a program to generate a continuous ramp waveform. Explain the operation of the 1408 for the calibration of a bipolar range +5V to -5V. Calculate the output  $V_o$  if the input is  $10000000_2$ . 5
7. (a) What is programmable device? 1  
(b) Discuss the control word format of 8155. 4  
(c) Design a square-wave generator with a pulse width of  $100\mu s$  by using the 8155 timer. Set up the timer in Mode 1 if the clock frequency is 3 MHz. 3.75
8. (a) Draw and describe the functional diagram of 8257 DMA controller. 5  
(b) Discuss the role of RS232 interface in detail. 3.75



University of Rajshahi  
Department of Computer Science and Engineering  
B.Sc. (Eng.) Part-4, Odd Semester, Examination-2017  
Course: CSE4141 (Computer Peripherals and Interfacing)  
Marks: 52.5 Time: 3 Hours

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Answer any three questions from each part

Part-A

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1. (a) What is meant by peripheral interfacing? Explain with example. 2.75  
(b) Discuss Port-addressed I/O and memory-mapped I/O interfacing with control signals and instructions. 6
2. a) Design an interfacing circuit to interface a 256-byte memory module externally using peripheral-mapped I/O. Also write the code to read and write data from this memory module. 4.75  
b) Define instruction cycle, machine cycle and T-state. 2  
c) Why serial data transfer is mostly preferred over parallel data transfer? Give reasons. 2
3. (a) What is ALE? Discuss how data and address buses of 8086 processors are de-multiplexed. 4  
(b) Describe the timing waveform of OUT instruction of 8085 processors. 4.75
4. (a) Define absolute address decoding and partial address decoding with example. 4  
(b) Discuss why and how handshake signals are used to interface I/O devices with processor. 4.75

Part-B

5. a) What is timer? Write the control word format of 8253 programmable interval timer. 3.75  
b) Interface 8253 programmable interval timer with 8085 microprocessors. Suppose Pin CS of a given 8253 is activated by binary address A7-A2 = 100101. Find the port addresses assigned to this 8253. 5  
Find the configuration for this 8253 if the control register is programmed as follows:  
MOV AL, 00110110  
OUT 97H, AL
6. (a) Discuss how time delay is calculated using loop within a loop technique. 4  
(b) Design a square-wave generator with a pulse width of 100 $\mu$ s by using the 8155 timer. Set up the timer in Mode 1 if the clock frequency is 3 MHz. 4.75
7. (a) Define maskable, non-maskable, vectored, and non-vectored interrupts of 8085 with example. 4  
(b) Can a microprocessor be interrupted again before the completion of first interrupt service? Explain. 1.75  
(c) Design a 1-minute timer using a 60Hz power line as an interrupting source. The output ports display minutes and seconds in BCD. At the end of the minute, the output ports should continue displaying one minute and zero seconds. 3
8. (a) Discuss about Successive-Approximation A/D converter. 4  
(b) Design an output port with the address FFH to interface the 1408 D/A converter that is calibrated for 0 to 10V range. Write a program to generate a continuous ramp waveform. Explain the operation of the 1408 for the calibration of a bipolar range +5V to -5V. 4.75



University of Rajshahi  
Department of Computer Science and Engineering  
B.Sc. (Engg.) Part-4, Odd Semester, Examination-2016  
Course: CSE-4141 (Computer Peripherals and Interfacing)  
Marks: 52.5 Time: 3 Hours

[N.B. Answer any Six questions taking at least Three from each part]

**Part-A**

1. (a) Define peripheral interfacing. 2  
(b) What do you mean by odd address bank and even address bank of 8086 processor? 2  
(c) Discuss how a byte and a word data is read from the odd boundary address and an even boundary address of 8086 processor. 4.75
2. (a) What is ALE? Discuss how the low-order address bus of 8086 is demultiplexed using ALE signal. 4  
(b) Is it possible to IN 40H and then OUT 40H? If possible then explain how it is. 2  
(c) Discuss absolute address decoding and partial address decoding. 2.75
3. (a) Discuss port-addressed I/O and memory-mapped I/O with necessary control signals and instructions. 4  
(b) Discuss the interfacing circuit to design a safety control system for home appliances using a 74LS138 decoder, a 74LS244 buffer, and a 74LS373 latch under memory-mapped I/O. 4.75
4. (a) Describe the delay calculation process using register pair. 3  
(b) Describe 8085 vectored interrupts. 3.75  
(c) What do you mean by maskable and non-maskable interrupts? 2

**Part-B**

5. (a) Design an output port with the address FFH to interface the 1408 D/A converter that is calibrated for 0 to 10V range. Write a program to generate a continuous ramp waveform. 4.75  
(b) Discuss successive-approximation A/D converter. 4
6. (a) What is programmable peripheral interface (PPI) device? Discuss about the I/O ports of 8155 PPI. 5  
(b) Design a square wave generator with a pulse width of 50 micro-seconds by using 8155 PPI timer. Setup the timer in mode-1 and the clock frequency is 3 MHz. 3.75
7. (a) What is synchronous and asynchronous transmission? 2  
(b) Write a main program to count continuously in binary with a one-second delay between each count-end write a service routine at XX70 to flash FFH five times when the program is interrupted, with some appropriate delay between each flash. 3.75  
(c) What is DMA? What are the uses of DMA? 3
8. (a) Discuss 8255A control word formats for I/O mode and BSR mode. 4.75  
(b) Draw and discuss the block diagram of 8254 programmable interval timer. 4



**University of Rajshahi**  
**Department of Computer Science & Engineering**  
B. Sc. (Engg.) 4<sup>th</sup> Year Odd Semester Examination 2015  
Course: CSE-4141 (Session 2011-12) & CSE-4151 (Session 2010-11)  
Course Title: Computer Peripheral & Interfacing  
Full Marks: 52.5      Duration: 3(Three) Hours

**Answer any 06(Six) of the following questions taking 03(Three) from each part**

**Part-A**

1. a) What do you mean by peripheral interfacing? 1.75  
b) Discuss how address buses and data buses of 8086-microprocessor family are multiplexed and how they are de-multiplexed? 5  
c) Is it possible to IN 20H and then OUT 20H? If possible then explain how it is. 2
2. a) What do you mean by odd address bank and even address bank 8086-proessor. 2.5  
b) Discuss how a byte and a word data is read from the odd boundary address and a even boundary address of 8086-processor. 4.5  
c) Mention the functions of READY and HOLD signal of 8086-processor. 1.75
3. a) Discuss port addressed I/O and memory-mapped I/O with necessary control signals and instructions. 4  
b) Discuss absolute address decoding and partial address decoding. 2.75  
c) Discuss how time delay is calculated using loop within loop technique. 2
4. a) What happens when a microprocessor is interrupted? 3  
b) Why do we use buffer with input devices and latches with output devices in order to interface with microprocessor? 3  
c) State the name of different flags of 8085-microprocessor. 2.75

**Part-B**

5. a) Define maskable and non-maskable, vectored and non-vectored interrupts of 8085-microprocessor? 3  
b) Write a main program to count continuously in binary with a one-second delay between each count and write a service routine at XX70H to flash FFH five times when the program is interrupted with some appropriate delay between each flash. 3  
c) What are TRAP and RST 7.5? Mention the difference between RST 7.5 and RST 7. 2.75
6. a) Discuss the different priority mode of 8259 programmable interrupt controller. 4  
b) Draw the block diagram of a 8257 DMA controller. Also explain the main functions of each block. 4.75
7. a) Discuss the control word format of 8155. 3.75  
b) Design a square-wave generator with a pulse width of 100 $\mu$ s by using the 8155 timer. Set up the timer in Mode 1 if the clock frequency is 3MHz. 5
8. a) Discuss the ports and modes of 8255A programmable peripheral interface device. 3.75  
b) Discuss 8255A control word format for I/O mode. 3  
c) Discuss BSR Mode of 8255A. 2



**University of Rajshahi**  
**Department of Computer Science and Engineering**  
**B.Sc. Engg. Part-4, Odd Semester, Examination-2014**  
**Course: CSE-4151 (Computer Peripherals and Interfacing)**  
**Marks:52.5      Time: 3:00 Hours**

[N.B. Answer any SIX of the following questions taking THREE from each part]

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**Part-A**

1. (a) Define computer interfacing with example. 2  
(b) Distinguish between absolute and partial address decoding. 2  
(c) Discuss peripheral-mapped I/O and memory-mapped I/O with necessary control signals and instruction. 4.75
2. (a) Can it be- IN 20H and then OUT 20H? Explain your answer. 3  
(b) Discuss how 8085 is interfaced with a common anode seven-segment LED using a 74LS138 decoder and a 74LS373 latch as an output port. Also write the program to display digit 7 to the output port. 5.75
3. (a) What are the control and status signals of 8085? 2  
(b) What do you mean by MPU? Is 8085 an MPU? Why or why not? 2  
(c) Discuss how the low-order address bus of 8085 is demultiplexed using ALE signal. 4.75
4. (a) Mention the steps with figure to generate device select pulse for selecting a device prior to data transfer. 3  
(b) Discuss the interfacing circuit to design a safety control system for home appliances under the following conditions- 5.75  
    i) use a 74LS138 Decoder to generate device select pulse for memory-mapped I/O.  
    ii) use a 74LS244 Tri-state Octal Buffer to interface eight switches.  
    iii) use a 74LS373 Octal Latch to interface eight home appliances through relay.  
    Also write the instructions to operate the controlling system.

**Part-B**

5. (a) Discuss how time delay is calculated using Loop within Loop technique. 4  
(b) Draw and discuss how an A/D converter is made using Successive-Approximation technique. 4.75
6. (a) Discuss the I/O ports and Timer of 8155. 4.75  
(b) Design a square-wave generator with a pulse width of  $100\mu s$  by using the 8155 timer. 4  
    Set up the timer in Mode 1 if the clock frequency is  $3MHz$ .
7. (a) Draw and describe the functional diagram of 8257 DMA controller. 4.75  
(b) Discuss DMA execution in master mode and slave mode. 4
8. (a) Discuss 8255A control word format for I/O mode. 4  
(b) Draw an schematic interfacing diagram of 8254 to perform the following operations: 4.75  
    i) Write a subroutine to initialize counter 2 in Mode 0 with a count of  $50,000_{10}$ . The subroutine should also include reading counts on the fly; when the count reaches zero, it should return to the main program.  
    ii) Write a main program to display seconds by calling the subroutine as many times as necessary.