

B.Tech III Year II Semester (R09) Supplementary Examinations May/June 2017

**MICROPROCESSORS & MICROCONTROLLERS**

(Common to EEE, ECE, CSE, EIE and E.Con.E)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) What are the advantages of Memory segmentation in 8086 microprocessor?  
(b) Discuss in brief about assembler directives.
- 2 (a) Write an ALP in 8086 to divide a 32-bit number by a 16-bit number.  
(b) Write an ALP in 8086 to add two 16 bit decimal numbers.
- 3 (a) Draw the block diagram of 8237 & explain its interfacing to 8086 Microprocessor with a neat sketch.  
(b) Briefly explain the maximum mode configuration of 8086.
- 4 (a) What is the use of Key board and display controller?  
(b) Give the BSR mode format of 8255.
- 5 (a) Describe High-speed Serial Communication Standards.  
(b) Give short notes on USB.
- 6 (a) Explain the following terms with reference to 8259 with examples:  
(i) Fully nested mode.  
(ii) Automatic rotation.  
(b) Bring out the features of 8259.
- 7 (a) Draw and discuss the format and bit definition of TMOD register of 8051.  
(b) Describe the various interrupts of 8051.
- 8 (a) Describe about versions and cores of ARM microcontrollers.  
(b) Give salient features about ARM microcontrollers.

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B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017  
**MICROPROCESSORS & MICROCONTROLLERS**  
(Common to EEE, ECE and EIE)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What is the need for ALE signal in 8085 microprocessor?
  - (b) Define instruction cycle and machine cycle.
  - (c) List the flags of 8086 microprocessor.
  - (d) Define pipelining.
  - (e) Discuss 8086 instructions used for ASCII and BCD arithmetic.
  - (f) What are called assembler directives?
  - (g) What is key bouncing?
  - (h) List advantages and disadvantages of parallel communication over serial communication.
  - (i) What is the function of DPTR register?
  - (j) What are register banks in 8051 microcontroller?

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 Describe functional block diagram of 8085 microprocessor.
- OR**
- 3 (a) Draw and explain the timing diagrams for the following instruction with appropriate control and status signal: CALL 8000.  
(b) What is meant by PSW?

**UNIT – II**

- 4 Explain about the register organization of 8086 processor in detail.
- OR**
- 5 Describe about the signals involved in minimum mode operation of 8086 microprocessor based system with the timing diagram.

**UNIT – III**

- 6 Explain different addressing modes in 8086 microprocessor and discuss each mode with an example.
- OR**
- 7 (a) Explain about the following assembler directives: END P, EQU, EVEN, EXTRN with examples.  
(b) Write an assembly language program in 8086 to generate Fibonacci series.

**UNIT – IV**

- 8 Draw the complete block diagram of 8279 keyboard display interface and explain the functions of each block.
- OR**
- 9 What is DMA? Explain DMA based data transfer using 8257 DMA controller.

**UNIT – V**

- 10 Explain in detail about the I/O ports of 8051 microcontroller.
- OR**
- 11 Explain memory organization and SFR area of 8051 microcontroller.

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(Common to EEE, ECE and EIE)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Explain the function of ALE in 8085 microprocessor.
  - (b) What are the different hardware interrupts of 8085?
  - (c) Name any four flags in 8086.
  - (d) What is the use of instruction queue in 8086 microprocessor?
  - (e) Mention the functions of SI and DI.
  - (f) What is meant by software interrupt in 8086?
  - (g) What are the various modes of data transfer?
  - (h) What is the function of scan section in keyboard interface?
  - (i) What are the advantages of microcontroller over microprocessor?
  - (j) Name the five interrupt sources of 8051 microcontroller.

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 (a) Draw the timing diagram and explain the execution of the instruction IN 82H of 8085 microprocessor.  
(b) Name and explain different addressing modes used in 8085 using suitable examples.

**OR**

- 3 How 8085 instructions are classified according to their functional categories? Explain with examples.

**UNIT – II**

- 4 Explain with neat diagram the internal architecture of 8086 microprocessor.

**OR**

- 5 Explain in detail about 8086 interrupts.

**UNIT – III**

- 6 Write an assembly language program in 8086 to sort an array of 10 numbers in ascending order.

**OR**

- 7 (a) Explain various assembler directives with examples.  
(b) Write an assembly language program in 8086 to convert BCD data into binary data.

**UNIT – IV**

- 8 With neat functional block diagram, explain the 8255 programmable peripheral interface and its operating modes.

**OR**

- 9 Draw the block diagram of 8254 programmable interval timer and explain its various modes of operation.

**UNIT – V**

- 10 Describe the different modes of operation of timers/counters in 8051 with its associated register.

**OR**

- 11 Explain the architecture of 8051 microcontroller with neat diagram.

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Code: 9A04602

**R09**

B.Tech III Year II Semester (R09) Regular & Supplementary Examinations May/June 2015

**MICROPROCESSORS & MICROCONTROLLERS**

(Common to EEE, ECE, CSE, EIE and E.Con.E)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Brief out the special functions of general purpose registers.  
(b) Discuss about 8086 flag register and functions of flags.
- 2 (a) Write an ALP in 8086 to search for a byte in a given set of 8 bit numbers using string instructions.  
(b) Write an ALP in 8086 to multiply two 8 bit numbers.
- 3 (a) Explain the need for DMA and DMA transfer method.  
(b) Explain about minimum mode operation of 8086.
- 4 (a) Give hardware and software for 8-bit ADC interfacing to 8086.  
(b) Discuss about DOS and BIOS interrupts.
- 5 (a) Draw the block diagram of 8251 and explain each block.  
(b) Discuss the serial data transmission standards and their specifications.
- 6 (a) With neat diagrams explain the five modes of operation of 8253 in detail.  
(b) Draw the block diagram of 8253 and explain about each block in detail.
- 7 (a) Write a brief note on interrupt priority in 8051.  
(b) Explain why mode 0 is not suitable for 8051 communications.
- 8 With neat sketches explain architecture versions and families of ARM.

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Code: 9A04602

R09

B.Tech III Year II Semester (R09) Regular & Supplementary Examinations June 2014

**MICROPROCESSORS & MICROCONTROLLERS**

(Common to EEE, ECE, CSE, EIE & E.Con.E)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Brief out the special functions of general purpose registers.  
(b) Discuss about 8086 flag register and functions of flags.
- 2 (a) Develop a far procedure declared as PUBLIC to convert a 4-digit BCD number to its equivalent hex number.  
(b) Develop a near procedure to find the GCD of two numbers of 2-digit Hex. Use this procedure to find the GCD of three numbers.
- 3 (a) Draw the memory read machine cycle in minimum mode and also explain the operation in each T state.  
(b) Draw and explain the memory read machine cycle in maximum mode.
- 4 (a) Design a circuit to activate an actuator, based on a bit combination given by eight switches interfaced to a microprocessor.  
(b) Design an interface circuit to feed numbers 0-9 through linearly encoded switches and to display the number on a seven segment LED through a microprocessor.
- 5 (a) Explain control word format of 8251?  
(b) Define frame in asynchronous communication and draw it.
- 6 (a) What is the difference between RET and IRET? Discuss the result, if RET instruction is placed at the end of the interrupt service routine.  
(b) What is the vector address of type 50 H interrupt?
- 7 (a) Show different methods by which a byte in TCON is copied to register R2.  
(b) Write 8051 instructions to set timer T0 to an initial setting of 1234 H.
- 8 With neat sketches explain architecture versions and families of ARM.

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Code: 9A04602

III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

**MICROPROCESSORS & MICROCONTROLLERS**

(Common to EEE, ECE, CSE, EIE & E.Con.E)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 (a) Why the lower order address bus is multiplexed with data bus? How they will be de-multiplexed?  
(b) Differentiate between maskable and non-maskable interrupts.
- 2 (a) Write an ALP in 8086 to check the number is prime or not.  
(b) Write an ALP in 8086 to convert un packed BCD to packed BCD.
- 3 (a) Draw the memory write machine cycle in minimum mode and explain the operation in each T state.  
(b) Draw and explain the memory write machine cycle in maximum mode.
- 4 (a) Explain how to interface a stepper motor with 4-step input sequence to 8086 based system with the help of hardware design. Write the instruction sequence to move the stepper motor 10 steps in clockwise and 12 steps in anti-clockwise direction.  
(b) Write in detail about stepper motor and actuators and their interface with 8086.
- 5 (a) What are the applications of 8251? Whether write operation is possible with status word & command word registers.  
(b) Distinguish between asynchronous and synchronous data transfer schemes.
- 6 (a) Draw the block diagram of 8253 and explain about each block in detail.  
(b) Explain about control word format and programming of 8253.
- 7 (a) Explain in brief about programming external hardware interrupts in 8051.  
(b) What are the steps involved in programming the 8051 to receive data serially?
- 8 (a) Explain the importance of each pin in MCS-96 microcontrollers.  
(b) Give a short note on 80196 micro controller of MCS-96 family.

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III B. Tech II Semester (R09) Regular &amp; Supplementary Examinations, April/May 2013

**MICROPROCESSORS & MICROCONTROLLERS**

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Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Discuss the memory segmentation in 8086 microprocessor.  
(b) Briefly explain the architecture of 8086 microprocessor with a neat sketch.
- 2 Assume that the symbol table starting at location TABLE consists of 100 entries. Each entry has 80 bytes with the first 8 bytes representing the name field and the remaining 72 bytes representing the information field. Write an instruction sequence to search this table for a given name of 8 characters stored in NAME. If the name is found, copy the associated information into INFO, otherwise, fill INFO with null characters.
- 3 (a) Explain the control pins used in minimum mode operation.  
(b) Differentiate minimum and maximum mode of 8086.
- 4 (a) With neat layout, explain how a microprocessor can be used for data acquisition system using A/D converters and D/A converters.  
(b) Explain in detail about the interrupt structure of 8086 microprocessor.
- 5 (a) What is the significance of SYNC DETECT & BREAK DETECT signals in 8251?  
(b) Define command word & status word register of 8251.
- 6 (a) Draw the pin diagram of 8259 and explain briefly about the function of each pin.  
(b) Draw the internal block diagram of 8259 and explain about each block.
- 7 (a) Write program to load accumulator, DPH & DPL using 8051.  
(b) Write short notes on the use of control signals  $\overline{WR}$  and  $\overline{RD}$ .
- 8 Explain address mapping and memory mapping in detail about MCS-96 micro controllers.

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III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

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Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 (a) Discuss the various addressing modes of 8086. What are displacement, base and index? What is an effective address or offset?  
(b) What are the advantages of the instruction queue in 8086?
- 2 (a) Write an ALP to separate and count the numbers from positive negative and zero numbers from a given set of 8 bit numbers.  
(b) Write an ALP in 8086 to convert packed BCD to unpacked BCD.
- 3 (a) Explain in brief the need for DMA controller and its working in an 8086 based system.  
(b) Differentiate minimum and maximum mode of 8086.
- 4 (a) Draw the schematic diagram of 8255 PPI and explain different modes of operation of 8255 with example.  
(b) Draw the block diagram of 8255 and explain each block.
- 5 (a) What is parity error, over run error & frame error in 8251? What is hunt mode in 8251?  
(b) Explain about USB with necessary example & analysis.
- 6 (a) Explain the modes of operation of 8253 in detail.  
(b) Why do we prefer interrupt driven data transfer than programmed I/O transfer? Show the complete hardware design to resolve the multiple interrupts based on priority.
- 7 (a) What is assembly language program? What is the function of SWAP? What is debugging?  
(b) Write a program to subtract the contents of R1 of Bank 0 from the contents of R0 of Bank 2.
- 8 (a) Describe about versions and cores of ARM microcontrollers.  
(b) Give salient features about ARM microcontrollers.

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III B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2013

**MICROPROCESSORS & MICROCONTROLLERS**

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Time: 3 hours

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- 1 (a) Write an assembly language program that will examine an ASCII string of 100 characters and replace each decimal digit by a %. The character string starts at STRG.  
(b) Explain the prefix instruction format of 8086 processor. Discuss how these instructions are useful in string manipulation.
- 2 (a) Write an ALP in 8086 to multiply two 16 bit numbers and the result is 32 bit.  
(b) Write an ALP in 8086 to add two 8 bit ASCII numbers.
- 3 (a) What are the registers available in 8257? What are their functions?  
(b) Draw and discuss the status registers of 8257.
- 4 (a) Give the relevant hardware and software for interfacing stepper motor to 8086 based system.  
(b) Explain A/D converter interface to 8086 micro processor.
- 5 (a) Define mode word register of 8251 for asynchronous mode.  
(b) Define mode word register of 8251 for sync mode.
- 6 (a) With neat block diagram explain the functions of 8259.  
(b) Explain the programming sequence of PIC along with flow chart explain each command word in detail.
- 7 (a) Write a program to load accumulator A, DPH and DPL with 30 H.  
(b) Write short notes on external interrupts of 8051.
- 8 (a) What is the difference between Interrupt Request (IRQ) and Fast Interrupt Request (FIQ) in ARM? Explain.  
(b) Compare the CPSR and SPSR registers formats and their purpose in different modes of ARM processor operations.

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III B. Tech II Semester (R09) Regular Examinations, April/May 2012  
**MICROPROCESSORS & MICROCONTROLLERS**  
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Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
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- 1 (a) Briefly explain the internal architecture of MCS-96.  
(b) Discuss about the process memory map of MCS-96.
- 2 (a) What are the advantages of memory segmentation in 8086 microprocessor?  
(b) Discuss in brief about assembler directives.
- 3 (a) Write an ALP in 8086 to find the largest and smallest of a set of 8-bit numbers.  
(b) Write an ALP in 8086 to add two ASCII numbers.
- 4 (a) Draw the block diagram of 8237 & explain its interfacing to 8086 microprocessor with a neat sketch.  
(b) Briefly explain the maximum mode configuration of 8086.
- 5 Sketch and explain the interface of PPI 8255 to the 8086 microprocessor in minimum mode. Interface four 7 segment LEDs to display as a BCD counter.
- 6 (a) A terminal is transmitting asynchronous serial data at 1200 bd. What is the bit time? Assuming 8 data bits, a parity bit and 1 stop bit how long does it take to transmit one character.  
(b) Draw necessary circuit to interface 8251 to an 8086 based system with an address 0C0H. Write the sequence of instructions to initialize 8251 for synchronous transmission. (Assume the necessary data).
- 7 (a) Draw the block diagram for multiple 8259A based interrupt system.  
(b) Explain about cascading of 8259s and its functioning.
- 8 (a) What is microcontroller? List the features of 8051 microcontroller. Name the five interrupt sources of 8051.  
(b) Write an assembly language program in 8051 to find the GCD of two numbers.

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- 1 (a) Explain the architecture of 8086 microprocessor.  
(b) Explain the segmentation in 8086 microprocessor. What are the different registers used for this purpose?
- 2 (a) Write an ALP to generate the FIBONOCI series.  
(b) Write an ALP in 8086 to find 1's complement of a 16 bit hexadecimal number.
- 3 Explain 8257 DMA interface to 8086 micro processor & what are the registers available in 8257? What are their functions?
- 4 (a) Explain the functional diagram of 8279 keyboard and display controller.  
(b) Discuss about DOS and BIOS interrupts.
- 5 (a) Explain IOCO and IOSO register for timer 1 in 80196.  
(b) What are the interrupt sources for synchronous serial transmission and reception in 80196? What are the identification flags and local enable bits for these sources?
- 6 Distinguish between Asynchronous and Synchronous data transfer schemes & explain block diagram IC 8251. Explain the logic of 8251 program.
- 7 (a) With neat diagrams explain the five modes of operation of 8253 in detail.  
(b) Draw the block diagram of 8253 and explain about each block in detail.
- 8 (a) What is assembly language program? What is the function of SWAP?  
(b) List out the steps involved in programming the 8051 to transfer data serially.

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- 1 Explain the instruction set of 8051 microcontroller. Write a program in 8051 to perform multiplication of two numbers using 8051.
- 2 Explain about addressing modes and instruction set of MCS-96 family.
- 3 (a) Write in detail about the addressing modes of 8086 microprocessor.  
(b) What are various types of procedures? Give examples.
- 4 (a) Write a program to initialize 8251 in synchronous mode with even parity, single SYNCH character, 7 bit data character. Then receive FFH bytes of data from a remote terminal and store it in the memory at address 5000 H: 2000 H.  
(b) Why are the two ground pins on an RS-232C connector not just jumpered together?
- 5 (a) Explain need and importance of DMA.  
(b) Discuss about Static RAM & EPROM with reference to 8086.
- 6 (a) Sketch the interfacing of PPI 8255 to the microprocessor.  
(b) Interface four 7 segment LEDs to display as a BCD counter.
- 7 (a) It is necessary to serve 18 interrupt requests using 8259's. The address map for the 8259's is given from 0A00H to 0A0FH. Show the complete interface with 8086 system bus. These 18 interrupts are to be requested from interrupt type 040H on words, with edge triggered mode and auto end of interrupt. Give the initialization sequence for all 8259's.  
(b) Explain the operating modes of 8259.
- 8 (a) Write an ALP in 8086 to add five 8 bit numbers and the result is 16 bit.  
(b) Write an ALP in 8086 to add two 8 bit decimal numbers.

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- 1 (a) Explain the advantages of using the USART chips in microprocessor based systems.  
(b) Discuss how 8251 is used for serial communication of data.
- 2 (a) Explain the flag register of 8086.  
(b) Explain the concept of memory segmentation.
- 3 (a) Write about interrupt sequence in an 8086 system.  
(b) Explain about command words of 8259.
- 4 (a) Write a recursive routine to evaluate the following polynomial  $Y = A_0 + A_1X + A_2X^2 + A_3X^3 + \dots + A_NX^N$ . The coefficients  $A_0, A_1, A_2, \dots, A_N$  are to be successive words in memory and all parameter addresses are to be passed via the stack.  
(b) Write a FAR procedure SER WORD that searches a word array for a given word and sets the value of a word parameter to the index of the element in the array if a match is found; otherwise, it puts a -1 in the index word parameter. The parameters are to be passed to the procedure via a parameter address table. Give a sequence for calling SER WORD to search ARRAY 1 of length LENGTH 1 for variable 'ID' and put the index in INDEX 1.
- 5 What is the difference between minimum and maximum modes of 8086 and also explain how 8086 microprocessor can be configured in minimum and maximum modes of operations?
- 6 (a) Explain in brief about programming timer interrupts in 8051.  
(b) Discuss the bit format of IP register of 8051.
- 7 (a) Explain the advantages of using the keyboard and display controller chips in microprocessor based system.  
(b) Write a program using RST 5.5 interrupt to get an input from keyboard and display it on the display system.
- 8 (a) Explain the historical perspective in development of MCS - 96 family.  
(b) Explain the register to register architecture concept of MCS - 96 family.

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