PART – C (1×15=15 Marks)

16. a) Design a microcontroller based system for taking sensor data from an agricultural field and displaying the data, generating alarms, causing actuations and aslo for sending the data to a PC. A complete description of this system should be given.

The following points are to be taken care of.

i) Draw a block diagram of the system and suggest a suitable microcontroller.

ii) Humidity and temperature are the sensor data.

iii) Show the device that displays these parameters.

iv) If these sensor values goes above a threshold, sound alarm and display should occur.

v) If temperature goes above a threshold, a motorised pump should be activated to water the field.

vi) Enumerate the steps for the microcontroller to be connected to the P.C.

(OR)

b) With neat block diagram explain the functions of ARM processor. Compare it with PIC and list out the major differences. (8+7)

21/11/19 FN

Reg. No. :

Question Paper Code : 90191

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fifth Semester

EC8691 – MICROPROCESSORS AND MICROCONTROLLERS

(Common to Information Technology/Computer Science and Engineering/ Computer and Communication Engineering)

(Regulations 2017)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. For 8086 microprocessor, the contents of the registers are, CS = 2001H, SS = 6046H, IP = 2456H, SP = 2200H. Calculate the corresponding physical addresses for the addressed byte in
   a) CS
   b) SS

2. Give examples for the following modes of addressing.
   i) Relative Based Indexed mode
   ii) Direct addressing.

3. State the function of ALE signal in 8086.

4. Draw the simplified diagram of co-processor based multiprocessor system.

5. What is the function of the following two signals in an ADC (while interfacing to a microprocessor) ?
   i) EOC
   ii) SC

6. List the function of HOLD and HLDA in 8086.

7. Give the format of the register PSW of 8051 and name each bit.

8. How does the 8051 differentiate between bit and byte addresses in its internal RAM ?

9. Give the format and list the function of the instruction DJNZ for 8051.

10. What are the interrupts of 8051 ? Highlight the function of any two interrupts.

PART – B (5×13=65 Marks)

11. a) i) Draw the architectural block diagram of 8086 with its registers.

ii) Write a program to find the average of 10 bytes stored in memory.

(OR)

b) i) Find the status of the CF and ZF flags after the execution of each of the following set of instructions. Given that AX = 4160H.

i) ADD AX, 9034H

ii) CMP AX, 0B08H

iii) XOR AL, AL

iv) MOV AL, 34H

ii) Write a program for 8086 microprocessor that multiples two bytes and stores the result in memory.

12. a) Draw the diagram showing address demultiplexing for 8086. Explain the use of each IC in the system and the relevant pins and signals.

(OR)

b) Draw the timing diagram for the 'Memory Read' machine cycle of 8086. Explain the function of the relevant signals and discuss how each signal changes in the progress of the machine cycle.

13. a) i) Draw the block diagram of the PPI 8255 and explain the ports and modes of the chip.

ii) Write a program in assembly language to set/reset the following bits of Port C. Use the BSR feature of the chip.

1) PC_0 to be set

2) PC_7 to be reset

3) PC_1 to be set

(OR)

b) i) Draw the connections between an ADC and 8086, using 8255 as an interface. Write a program to generate a triangular waveform using this setup.

ii) Draw the block diagram of the 8251 and discuss how it caters to serial communication. Write the steps in transmitting one byte of data serially.

14. a) For 8051 microcontroller, discuss the following :

i) How is RAM organized and addressed ?

ii) How many register banks are present in RAM and how is bank switching executed ?

(OR)

b) i) Write a program in 8051 assembly language to find the biggest of three numbers.

ii) Write a program in 8051 assembly language to create a delay of 0.5 seconds, for a clock frequency of 20 MHz.

Note: Do not use any hardware timer.

15. a) Draw and explain the interfacing connections between an 8051 and a stepper motor by using driver IC as an interface. Write the steps and assembly program to rotate the stepper motor in the clockwise direction.

(OR)

b) i) Write the assembly language program to generate a square wave using any timer, for an 8051 microcontroller.

ii) For the above generated square wave, if the crystal frequency is 20 MHz and the frequency of the wave is 10 KHz. Write the assembly language program referring to the bit configuration given below :

MSB LSB

Gate	C/T	M1	M0	Gate	C/T	M1	M0

Timer 1 Timer 0

Bit configuration of the TMOD register

MSB LSB

TF1	TR1	TF0	TR0	IE1	IT1	IE0	IT0

TCON bits used for timer programming

Reg. No. | | | | | | | | | | | | |

14-06-2016 AN

Question Paper Code : 57322

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Manufacturing Engineering

EE6502 – MICROPROCESSORS AND MICROCONTROLLERS

(Common to Fifth semester Electronics and Instrumentation Engineering / Instrumentation and Control Engineering, Robotics and Automation Engineering and Electrical and Electronics Engineering)

(Regulations 2013)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What is the function of program counter in 8085 microporcessor ?
2. Mention the purpose of SID and SOD lines.
3. What is a recursive procedures ?
4. Define stack and stack related instructions.
5. Explain the operating mode 0 of 8051 ports.
6. List the features of 8051 microcontroller.
7. What are the internal devices of a typical DAC.
8. What are the features used mode 2 in 8255 ?
9. Write a program to find 2's complement using 8051.
10. How a keyboard matrix is formed in keyboard interface ?

PART – B (5 × 16 = 80 Marks)

11. (a) Explain with a neat block diagram the architecture of 8085 microprocessor. **(16)**

OR

(b) (i) Describe the interrupts of 8085 microprocessor. **(8)**

(ii) Explain the Timing diagram of STA $526A_H$. **(8)**

12. (a) (i) Compare memory mapping and I/O mapping technique in 8085. **(8)**

(ii) Write an assembly language program to sort numbers in ascending order. **(8)**

OR

(b) (i) Write a program to output square wave of 1 kHz frequency on the SOD pin of 8085 for 5 seconds. **(8)**

(ii) Describe the categories of instructions used for data manipulations in 8085 microprocessor. **(8)**

13. (a) (i) Explain the vectored interrupts in 8051 microcontroller. **(8)**

(ii) Explain the different addressing modes of 8051 microcontroller. **(8)**

OR

(b) Explain with a neat block diagram the architecture of 8051 microcontroller. **(16)**

14. (a) (i) Draw and explain the functional block diagram of 8254 timer. **(8)**

(ii) Draw and explain the functional block diagram of 8251. **(8)**

OR

(b) With neat diagram, explain the architecture and features of 8279 keyboard display controller. **(16)**

15. (a) Explain with a neat diagram the closed loop control of servo motor using microcontroller. **(16)**

OR

(b) A switch is connected to pin P2.7, write a ALP to monitor the status of switch and perform the following :

(i) if sw = 0 stepper motor moves clockwise

(ii) if sw = 1 stepper motor moves counter clockwise **(16)**

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71777

29/04/2017
AN

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Sixth/Fifth Semester

Electrical and Electronics Engineering

EE 6502 — MICROPROCESSORS AND MICROCONTROLLERS

(Common to Robotics and Automation Engineering, Electronics and Instrumentation Engineering, Instrumentation and Control Engineering, Manufacturing Engineering)

(Regulations 2013)

e : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Why data bus is bi-directional?

List out the machine cycles of 8085 microprocessor.

Write an 8085 program to swap lower and higher nibble of the contents of accumulator.

List different instruction formats.

Classify the addressing modes of 8051 microcontroller.

List any four Special Function registers.

What are the modes of 8254 timer?

What is meant by cascading in 8259?

Explain the function of DJNZ instruction.

What is meant by bit oriented instructions?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the interrupt structure of 8085 microprocessor. (8)

(ii) With pin diagram explain 8085 microprocessor. (8)

Or

(b) (i) Explain the registers of 8085 microprocessor? (8)

(ii) What is meant by memory interfacing? Explain with an example. (8)

12. (a) (i) Explain the addressing modes of 8085 microprocessor. (8)

(ii) Write an 8085 assembly language program to divide an 8 bit number by another 8 bit number? (8)

Or

(b) (i) Write an 8085 assembly language program to find the largest among 'N' number where the value of N should be stored in 4200 and the array of elements from 4201. Store the result in 4300? (8)

(ii) What is meant by subroutine? Explain how the stack is affected while calling a subroutine program. (8)

13. (a) Explain Timer modes of 8051 microcontroller. (16)

Or

(b) Explain the architecture of 8051 microcontroller with a block diagram. (16)

14. (a) Explain the functioning of 8255 programmable peripheral interface and its modes. (16)

Or

(b) Explain the working of 8237 as a DMA controller and its command registers and their functions. (16)

15. (a) Explain the stepper motor control using 8051 and write an assembly language program for running the stepper motor in clockwise direction. (16)

Or

(b) Explain the Closed loop control of a servo motor using 8051 with a neat diagram. (16)

Reg. No. :

Question Paper Code : 41004

04/05/18 FN

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Fifth Semester

Electrical and Electronics Engineering

EE6502 – MICROPROCESSORS AND MICROCONTROLLERS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering/Manufacturing Engineering/Robotics and Automation Engineering)

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. List the features of accumulator.
2. Write the difference between standard I/O and memory mapped I/O.
3. List the classification of instruction based on its size.
4. Define stack.
5. Compare microprocessor and microcontroller.
6. How the microcontrollers respond to any interrupt request ?
7. How the DMA operations perform in microprocessor ?
8. Write the modes of operation in 8254.
9. What is use of data pointer register ?
10. What is the advantage of closed loop control system for interfacing ?

PART – B **(5×13=65 Marks)**

11. a) Draw and explain the building blocks and its signal of 8085 processor. **(13)**

(OR)

b) i) Describe the interrupts of 8085 and its types with service routine. **(7)**

ii) Draw the timing diagram of MOV A, M instruction and explain each machine cycle. **(6)**

12. a) i) Explain the types of addressing modes in 8085 with suitable example. **(7)**

ii) Write an 8085 program to find the greatest number among 10 numbers. **(6)**

(OR)

b) i) Explain the types of instruction in 8085 with example. **(7)**

ii) Write an 8085 program to find the average of 10 numbers and find the execution time of program. **(6)**

13. a) Draw and explain the architecture of 8051 microcontroller. **(13)**

(OR)

b) Briefly discuss the ports of 8051, internal circuits and its functions in detail. **(13)**

14. a) Draw the functional diagram of 8255 and explain its control word, modes of operation. **(13)**

(OR)

b) Draw the functional diagram of 8251 and explain its block in detail. **(13)**

15. a) Illustrate the keyboard and display interface with 8051 and write the program to get the input 45H from the external keyboard and display it on the external display device. **(13)**

(OR)

b) Interface the stepper motor with 8051 and explain its operation of stepper motor with neat diagram and program to rotate in clockwise direction. **(13)**

PART – C **(1×15=15 Marks)**

16. a) Design an 8085 based system with 512B RAM, 4KB ROM, external keyboard and seven segment display device. **(15)**

(OR)

b) Design a microcontrolled based system to control the water level in the tank. **(15)**

10/04/19 AN

Reg. No. :

Question Paper Code : 52957

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fifth/Sixth Semester

Electrical and Electronics Engineering

EE 6502 – MICROPROCESSORS AND MICROCONTROLLERS

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering/Manufacturing Engineering/Robotics and Automation Engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the use of ALE in 8085 microprocessor.
2. What is the function of HOLD and HLDA in 8085 microprocessor?
3. What is a Subroutine. Mention the instructions related to subroutine in 8085 microprocessor?
4. If the 8085 adds 87H and 79H, specify the contents of the accumulator and the status of the S, Z, and CY flag?
5. What are the addressing modes supported by 8051?
6. Name the interrupts of 8051 microcontroller.
7. What is the use of 8251 IC?
8. What is the function of the DMA controller?
9. List the 8051 instructions that always clear the carry flag.
10. Distinguish between the functions of the instructions XCHG and SWAP of 8051.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the features in the architecture of 8085 microprocessor with a neat diagram. Explain the function of the various registers available in it.

Or

(b) (i) Explain the function of the various interrupts available with 8085 microprocessor. (7)

(ii) Explain with timing diagrams, the opcode fetch machine cycle of 8085 microprocessor. (6)

12. (a) (i) Explain the various addressing modes of 8085 microprocessor with example. (8)

(ii) Explain the Compare instructions of 8085 microprocessor. (5)

Or

(b) (i) Explain the various arithmetic instructions of 8085 with illustrative examples? (6)

(ii) Write an ALP for 8085 microprocessor to add data stored in memory from 4200H. The first element in the location 4200H gives the number of elements in the array. Store the result of the addition in 4300h and 4301 H. Assume the sum does not exceed 16 bits. (7)

13. (a) Describe the importance of the Program Counter, Data pointer, Program status word, Special Function Registers in 8051. (13)

Or

(b) (i) Explain the memory organization of 8051 microcontroller. (6)

(ii) Explain the function of the I/O ports available in 8051 microcontroller for data transfer. (7)

14. (a) Explain the features and operating modes of 8255. Explain its interfacing with 8085 microcontroller. (13)

Or

(b) Describe the features of the IC 8279 keyboard/display controller. (13)

15. (a) Explain with diagram the interfacing of keyboard and display using 8051 microcontroller. (13)

Or

(b) (i) Explain the various program branching instructions available with 8051 microcontroller. (6)

(ii) Write a Assembly language for 8051 microcontroller to divide the 8 bit number stored in memory location 2400H by the 8-bit data stored in memory location 2401H. Store the quotient in 2402 H and the remainder in 2403 H. (7)

PART C — (1 × 15 = 15 marks)

16. (a) With a neat diagram explain how stepper motor can be interfaced with 8085 microprocessor. Give both program and the interfacing circuit.

Or

(b) Differentiate between the following instructions clearly (5 × 2 = 10)

(i) Push and POP

(ii) CALL and Jump

(iii) ADD and ADC

(iv) INC and INX

(v) MOV B, B and MOV B, A

(vi) What is the general format of an 8085 instruction set? (5)

06/12/17 FN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50486

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Fifth/Sixth Semester
Electronics and Instrumentation Engineering
EE 6502 – MICROPROCESSORS AND MICROCONTROLLERS
(Common to : Electronics and Instrumentation Engineering, Instrumentation and Control Engineering, Manufacturing Engineering, Robotics and Automation Engineering)
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What are the flags available in 8085 processor ?
2. What are the interrupts available in 8085 ?
3. What are the types of addressing mode in 8085 microprocessor ?
4. Differentiate CALL instruction from JUMP instruction.
5. What are the addressing modes of 8051 microcontroller ?
6. What are the main features of 8051 microcontroller ?
7. Give the difference between maskable and non-maskable interrupts.
8. How is keyboard interfaced with microprocessor ?
9. What is baud rate ?
10. What is duty cycle in PWM ?

PART – B (5×13=65 Marks)

11. a) Explain with a neat block diagram, the architecture of 8085 microprocessor. (13)

(OR)

b) i) Describe the interrupts of 8085 microprocessor. (7)

ii) Draw and explain the flag register of 8085 in brief. (6)

12. a) With example, explain the different addressing modes of 8085 and the different types of instruction formats. (13)

(OR)

b) Explain the operations carried out when 8085 executes the instructions : (13)

i) MOV A, M (2)

ii) XCHG (2)

iii) DAD B (2)

iv) DAA (3)

v) LDA 6000 (2)

vi) SHLD 4000. (2)

13. a) i) Draw the data memory structure of 8051 microcontroller and explain. (7)

ii) Explain with block diagram, how to access external memory devices in an 8051 based system. (6)

(OR)

b) Discuss in detail, the hardware and software support provided by 8051 for serial communication. (13)

14. a) Draw the block diagram of 8255 (PPI) and explain its various operating modes. (13)

(OR)

b) With a neat diagram, explain the internal architecture of keyboard and display controller IC-8279. (13)

15. a) Explain with a neat diagram, the closed loop control of servomotor using microcontroller. (13)

(OR)

b) Explain the different types of instructions set used in 8051 microcontroller. (13)

PART – C (1×15=15 Marks)

16. a) Explain, the interfacing concept of analog to digital conversion with 8085 microprocessor. (15)

(OR)

b) With necessary diagram, explain the different modes of operation of 8254, in detail. (15)

PART B — (5 × 13 = 65 marks)

11. (a) With neat block diagram, explain the various functional building blocks of 8085 processor.

Or

(b) Define vector address. List the various interrupts of 8085 processor and elucidate the use of Interrupt service routine.

12. (a) Define addressing mode. Identify the addressing mode of the following instructions and explain them.

(i) STA 6350H

(ii) CMA

(iii) MOV A,M

(iv) MOV D,E

(v) MVI A,A7H.

Or

(b) Develop an algorithm and 8085 assembly language program to sort 100 byte type data. Explain the instructions used in the program.

13. (a) Explain the pinouts of 8051 microcontroller.

Or

(b) Describe the timing diagram of external data memory read cycle of 8051.

14. (a) (i) Explain the architecture of 8259. (9)

(ii) How 8259 is interfaced with 8085 or 8051? (4)

Or

(b) Explain the Interfacing of DAC with 8051 or 8085 with neat diagram and write a program for generating any typical waveform.

15. (a) Explain the various bit manipulation instructions in 8051 with examples.

Or

(b) Develop a 8051 ALP to evaluate an arithmetic expression (A-B) X C where A, B, C are 8 bit data in internal memory. Assume A>B and store the result in external memory. Explain the program developed.

PART C — (1 × 15 = 15 marks)

16. (a) Design a system using 8085 or 8051 to blink four LEDs.

Or

(b) Design a stepper motor control system using 8051 microcontroller.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20459

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fifth/Sixth Semester

Electrical and Electronics Engineering

EE 6502 — MICROPROCESSORS AND MICROCONTROLLERS

(Common to : Electronics and Instrumentation Engineering/
Instrumentation and Control Engineering/Manufacturing Engineering/
Robotics and Automation Engineering)

(Regulations 2013)

(Also common to : PTEE 6502 — Microprocessors and Microcontrollers for B.E. (Part-Time) – Fourth Semester – Electrical and Electronics Engineering — Regulation 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the registers of 8085 processor.

2. State any four pins of 8085 processor which are used to generate control and status signals.

3. State any four data transfer instructions and their function.

4. Define subroutine.

5. State any four inbuilt features of 8051 microcontroller.

6. How multiplication is performed in 8085 and 8051?

7. Find the control word of 8255 if port A is configured as input and port B is configured as output in mode 0.

8. State the application of 8251 and 8279 ICs.

9. Specify the difference between MOV and MOVX instructions.

10. State any four applications of microcontroller.

Reg. No. :

Question Paper Code : 91492

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fifth/Sixth Semester

Manufacturing Engineering

EE6502 – MICROPROCESSORS AND MICROCONTROLLERS

(Common to Fifth Semester Electronics and Instrumentation Engineering/ Instrumentation and Control Engineering, Robotics and Automation Engineering and Electrical and Electronics Engineering)

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What is the function of program counter in 8085 microprocessor ?
2. Mention the purpose of SID and SOD lines.
3. How is time delay generated using subroutines ?
4. Explain the functioning of CMP instruction.
5. Explain the interrupts of 8051 microcontroller.
6. What is the significance of PSEN and EA pin in 8051 microcontroller ?
7. Give the difference between maskable and non-maskable interrupts.
8. How is keyboard interfaced with microprocessor ?
9. Explain the function of DJNZ instruction.
10. What is meant by bit oriented instructions ?

PART – B **(5×13=65 Marks)**

11. a) Explain with a neat block diagram, the architecture of 8085 microprocessor.

(OR)

b) i) Explain the interrupt structure of 8085 microprocessor. **(7)**

ii) Draw the timing diagram of Opcode Fetch machine cycle. **(6)**

12. a) i) Explain the logical instructions with examples. **(6)**

ii) Write an 8085 Assembly program to convert a Hexadecimal Number to ASCII code. **(7)**

(OR)

b) Write an 8085 Assembly language program to multiply two numbers in memory locations 4200 and 4201 and store the product in memory locations 4202 and 4203.

13. a) i) Explain the vectored interrupts in 8051 microcontroller. **(7)**

ii) Explain the different addressing modes of 8051 microcontroller. **(6)**

(OR)

b) Explain with a neat block diagram the architecture of 8051 microcontroller.

14. a) Draw the block diagram of 8255 (PPI) and explain its various operating modes.

(OR)

b) With a neat diagram, explain the internal architecture of keyboard and display controller IC-8279.

15. a) Explain the interfacing of stepper motor control with 8051 and write an assembly language program for running the stepper motor in clockwise direction.

(OR)

b) Explain the closed loop control of a servo motor using 8051 with a neat diagram.

PART – C **(1×15=15 Marks)**

16. a) Propose and develop a schematic sketch for closed loop control of position control using servo-motor and explain its controls using 8051.

(OR)

b) Develop a schematic sketch for washing machine controls with display using 8051.

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