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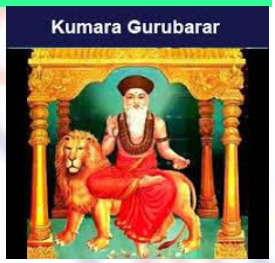
S.K.S.S ARTS COLLEGE, THIRUPPANANDAL - 612504



QUESTION BANK

Title of the Paper

MICRO PROCESSORS AND 'C' PROGRAMMING

Course: III B.Sc(Physics)

Prepared by

E.QUEENSE M.Sc., M.Phil., B.Ed.,

Assistant Professor

Department of Physics

MAJOR BASED ELECTIVE II
MICROPROCESSOR AND 'C' PROGRAMMING

Objective:

The purpose of this course is to introduce students about the key features and implementation of C language and 8085 Microprocessor assembly.

UNIT I Basics of Digital Computer

Basic components of a digital computer - Evolution of microprocessors - Important INTEL microprocessors - Hardware, Software and Firmware - Memory - Semiconductor memories - RAM,ROM - Flash memory – CCD memory – Cache memory - Buses.

UNIT II Intel 8085 and its Architecture

8085 - Pin Diagram - Architecture - Various registers - Status Flags - Interrupts and their order of priority - Addressing modes - Direct,Register, Register indirect, Immediate and implicit addressing - Instruction set - Data transfer group - Arithmetic Group - Logical group - Branch group, Stack, I/O and Machine control group.

UNIT III Assembly Language Programming

Addition - subtraction - multiplication -division of two 8- bit numbers - Finding the largest and smallest number in a data array-Arranging a list of numbers in ascending or descending order-complement – shift – mask-look up table– multibyte addition and subtraction –decimal addition - subtraction.

UNIT IV Introduction To C

Basic Structure of C Programs – Character set – C tokens - Keywords and identifiers – constants – variables – Data types – declaration of variables – Assigning values to variables – Symbolic constants – Operators and Expressions - Arithmetic operators - Relational, Logical and Assignment operators, Increment and Decrement operators – Conditional operator, Bitwise and Special operators– Arithmetic Expressions – Mathematical functions.

UNIT V Preliminaries And Functions

Data input and output – getchar, putchar, scanf, printf, gets, puts functions – Decision making and branching –if, if...else, else if ladder, switch, break, continue, goto – Decision making and looping – while, do... while, for, nested loops –Arrays (one-, two- and multi-dimensional arrays)- Declaration, Initialization of arrays.

Books for study:

1.B. Ram – Fundamentals of Microprocessors and Microcontrollers–Dhanpat Rai Publications (P) Ltd., New Delhi, 2013.

2.E. Balagurusamy – Programming in ANSI C – Tata McGraw Hill Education Private Limited, New Delhi,2012.

Books For Reference:

1.R. S.Gaonkar- Microprocessor Architecture, Programming, and Applicationswith the 8085, Penram International Publishing (India) Private Limited, Mumbai, 2007.

2.K. R. Venugopal and S. R. Prasad – Programming with C – Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002.

III B.Sc(PHYSICS)

MAJOR BASED ELECTIVE - II

MICROPROCESSOR AND C-PROGRAMMING

UNIT – I

(BASICS OF DIGITAL COMPUTER)

Choose the correct answer:

1. The memory which require refresh frequently is

    A) SRAM

    B) DRAM

    C) ROM

    D) EEPROM

2. In direct I/O instruction the port address has

    A) 8-bits

    B) 16-bits

    C) 12-Bits

    D) 32-bits

3. In microprocessor a REGISTER means

    A) Manual contain instructions

    B) Monitor program stored in a floppy disc

    C) A group of flip flop

    D) A group of logic gates

4. in binary bytes represent

    A) 4-bits

    B) 5-bits

    C) 7-bits

D) 8-bits

5. In EPROM the contents can be erased with

A) U.V. light

B) I.R light

C) Laser light

D) Ordinary light

6. Flash memory is ____

A) Electrically erasable

B) Reprogrammable

C) Inherently non-volatile memory

D) All these above

7. ROM is _____memory

A) Reprogrammable

B) Non-volatile memory

C) Flash memory

D) Volatile memory

8. Which is semiconductor memory?

A) RAM

B) ROM

C) PROM

D) All these above

9. The physical devices of a computer are

A) Hardware

B) Software

C) Firmware

D) None of these

10. Examples of operating system is ____

A) windowa-7

B) Google's Android

C) Chrome OS

D) All these above

ANSWERS:

1(B) 2.(A) 3.(C) 4.(D) 5.(A) 6.(D) 7.(B) 8.(D) 9.(A) 10.(D)

TWO MARKS

11. What is microprocessor?
12. What is microcomputer?
13. What are the main components of digital computer?
14. State that multiprocessor computer system.
15. Write about any two point's difference between microprocessor and microcontroller?
16. Define Hardware.
17. Define the software.
18. Define the firmware.
19. State that registers.
20. What are they semiconductor memories?

FIVE MARKS

21. What are the essential elements of a CPU? Discuss the function of each element.
22. What are the essential components of a digital computer?
23. Discuss the function of each components of digital computer?
24. Describe the important application of microcomputer.
25. What are the various types of memory? Explain that.

26. What do you understand by main memory?

27. What do you understand chache memory?

28. What do you understand by terms LAN? Discuss the various types.

29. What do you understand by terms LAN? Discuss the various types.

30. Explain: What do you understand by real and virtual memory.

TEN MARKS

31. Detailed explain about the basic components of a digital computer.

32. What do you about Evaluation of microprocessor?

33. Explain the Intel microprocessor. Describe the important application of μp.

34. What is Intel? For what purpose is it used?

35. What is the function of I/O and O/P device? Give example of I/O devices.

36. What do you understand by single-chip microcomputer? Where are they used? Give some examples.

37. Explain briefly semiconductor memory.

38. Explain: i) Main memory ii) semiconductor memory ii) chache memory

39. Show that the memory addressing capacity of a CPU is given by 2^n , where n is the number of address line of the CPU.

40. Detailed explain about Buses.

UNIT – II

(INTEL8085 AND ITS ARCHITECTURE)

Choose the correct answer:

1. The opcode fetch machine cycle is completed in_____ T-states.

   A) 3

   B) 5

   C) 4

   D) 7

2. 8085 μp has _____ number of general-purpose registers.

   A) 4

   B) 5

   C) 6

   D) 8

3. The instruction to move (copy) a data from one register to another register is

   A) MOV A, B

   B) MVI A, 25H

   C) NOP

   D) RET

4. Increment and Decrement operation involving and 8-bit register

   A) Memory carry flag

   B) Do not modify carry flag

   C) Do not modify zero flag

   D) None of above

5. The instruction SUB is called

   A) Comment

B) Operant

C) Mnemonics

D) Label

6. The instruction MOV B, A causes,

A) Contents of B register is transferred to A register

B) Components of A register is transferred to B register

C) Contents of A register is transferred to B register and the contents of A is erased

D) Contents of B register is transferred to A register and the contents of B is erased

7. The instruction STAX B is

A) Direct I/O instruction

B) Indirect simples I/O instruction

C) Memory-Mapped I/O instruction

D) None of the above

8. The instruction PUSH PSW is

A)$[\lfloor sp \rfloor - 1\ ] \leftarrow A$

B)$[H - L] \rightarrow [SP]$

C)$PSW \leftarrow [[SP]]$

D)$[L] \leftrightarrow [[SP]]$

9. The accumulator register is

A) One 8-bit register

B) Six 8-bit register

C) One 16-bit program counter.

D) Temporary register

10. Status flag contains five____

A) Register

B) Instruction

C) Flip flop

D) None of these

ANSWERS:

1.(C) 2. (C) 3. (A) 4. (B) 5. (C) 6. (B) 7. (C) 8. (A) 9. (A) 10. (C)

TWO MARKS

11. What are the various types of registers of Intel 8085?
12. What you understand the function of ALU?
13. State that status flag.
14. Write the about function of READY.
15. State that timing diagram.
16. Give any examples of instruction for branch group.
17. Explain what operation will take place. When the LXI rp, data; LDA addr Instruction.
18. What is stack?
19. Explain operation of LHLD addr and STA addr instruction.
20. What are the various types of instruction?

FIVE MARKS

21. Classify 8085 instructions in various group give examples of instruction.
22. Explain the basic concept of data formats.
23. Describe the Addressing modes. Give examples.
24. What is data transfer group? For what purpose is it used? Define detailed.
25. Define I/O and machine control group. Discuss about it.
26. Explain types of register of Intel 8085. Discuss their function.
27. Discuss detailed function of ALU of 8085.

28. Draw and explain the timing diagram for fetch operation.

29. Draw and explain Intel8085 μp.

30. Discuss the instruction cycle.

TEN MARKS

31. Detailed explain Architecture of Intel 8085 μp.

32. Discuss about instruction cycle and machine cycle and state.

33. Discuss about Fetch operation and Execute operation.

34. Discuss the function of following signals of 8085

    $\overline{RD}$, $\overline{WR}$, ALE, S_0 AND S_1

35. Discuss the function of following signals of 8085.

    IO/$\bar{M}$,

    INTR,

    $\overline{INTA}$,

    HLDA and

    READY

36. Draw and explain the timing diagram for I/O read and write operation.

37. Detailed explain 1-byte, 2-byte and 3-byte instruction.

38. Explain: Branch group instruction.

39. Explain briefly basic concept of instruction groups.

40. Explain: Arithmetic Groups.

UNIT- III

(ASSEMBLY LANGUAGE PROGRAMMING)

Choose the correct answer:

1. Assembly language programs are written using.

A) Hex. Code

B) Mnemonics

C) ASCII code

D) None of the view

2. For execution of an interrupt applied at INTR, Number of states required by 8085 μp are

A) 4

B) 6

C) 12

D) 18

3. In8085 which are the 16-bit registers?

A) Program counter

B) Stack pointer

C) Both A & B

D) None of the above

4. How many memory locations are required to store the instruction LXIH 0800_H in an 8085-assembly language program?

A) 1

B) 2

C) 3

D) 4

5. The instruction DEC N inform the assembler to

A) Decrement the content of N

B) Decrement the data addressed by N

C) Convert signed decimal number to binary

D) None of the above

6. Instructions performing action in assembly language are called

A) Imperative statements

B) Declarative statement

C) Directive statements

D) None of the above

7. Which of the following interrupt has highest priority?

A) INTR

B) TRAP

C) RST 7.5

D) RST 6.5

8. Number of machine cycles required for RET instruction in 8085μp is

A) 1

B) 2

C) 3

D) 4

9. What are Hardware interrupts?

A) TRAP

B) RST-7

C) INTR

D) All the above

10. What are the states of the Auxiliary carry (AC) and carry flag (dcy) after executing the following 8085 programs?

MVI L, $5D_H$

MVI L, $6B_H$

MOV A, H

ADDL

A) AC=0 AND CY=0

B) AC=0 AND CY=1

C) AC=1 AND CY=0

D) AC=1 AND CY=1

ANSWERS:

1.(B) 2.(C) 3.(C) 4.(B) 5.(A) 6.(A) 7.(B) 8.(3) 9.(D) 10.(C)

TWO MARKS

11. Why do we use XRA A instruction?

12. Compare CALL and PUSH instructions.

13. Compare RET and POP instruction.

14. List out the five categories of the 8085 instruction. Give examples of the instruction for each group.

15. What are the control-signals used for DMA operations?

16. Write about any three basic instructions.

17. Explain SUB r instruction.

18. Define MOV r, M data transfer.

19. Explain RAL instruction.

20. Explain DAA instruction.

FIVE MARKS

21. Write an assembly language program to Add two 8-bit numbers.

22. Write an assembly language program to Subtract two 8-bit numbers.

23. Write an assembly language program to Multiplication two 8-bit numbers.

24. Write an assembly language program to Division two 8-bit numbers.

25. Write an assembly language program to Shift rotate left and right.

26. Write an assembly language program to Mask-Look up table.

27. Write an assembly language program to find Multibyte Additions.

28. Write an assembly language program to Multibyte Subtraction.

29. Write an assembly language program to Find Decimal Addition.

30. Write an assembly language program to Decimal Subtraction.

TEN MARKS

31. Write an assembly language program to find Largest Number in a Data Array.

32. Write an assembly language program to find Smallest Number in Data Array.

33. Write an assembly language program to arrange a list of number in Ascending Order.

34. Write an assembly language program to arrange a list of number in Descending Order.

35. Write an assembly language program to complement of any two numbers.

36. Write an assembly language program to 8-bit Addition and Subtraction.

37. Write an assembly language program to16-bit Addition.

38. Write an assembly language program to16-bit Subtraction.

39. Write an assembly language program to 8-bit Division with its flow chart.

40. Write an assembly language program to Decimal Addition and Subtraction.

UNIT –IV

(INTRODUCTION TO C)

Choose the correct answer:

1. What are the types of linkages?

    A) Internal and External

    B) External; Internal and None

    C) External and None

    D) Internal

2. Which of the following special symbols allowed in a variable name?

    A) *(asterisk)

    B) 1(pipeline)

    C) – (hyphen)

    D) _ underscores.

3. Is there any different between following declaration?

    i) Extern int fun (); ii) int fun ();

    A) Both are identical

    B) no. difference, except extern int fun ();

    C) int fun(); is overrided with extern int fun();

    D) None of these

4. By default a real number is treated as a

    A) Float

    B) Double

    C) Long double

    D) Far double

5. If a variable is a pointer to a structure, then which of the following operator is used to access data members of the structure through the pointer variable?

A) .

B) &

C) *

D) →

6. A pointer is

A) A keyword used to create variables.

B) A variable that store address of an instruction

C) A variable that store address of another variable

D) All of the above

7. The operator used to get value at address stored in a pointer variable is

A) *

B) &

C) &&

D) II

8. What is stderr?

A) Standard error

B) Standard error types

C) Standard error streams

D) Standard error definitions

9. Which bitwise operator is suitable for turning off a particular bit in a number?

A) && operator

B) & operator

C) II operator

D)! Operator

10. Which bitwise operator is suitable for turning on a particular in a number?

A) && operator

B) & operator

C) II operator

D)! Operator

ANSWERS:

1.(B) 2.(D) 3.(B) 4.(B) 5.(D) 6.(C) 7.(B) 8.(C) 9.(B) 10.(D)

TWO MARKS

11. What is initialization? Why is it important?
12. How do variable and symbolic name differ?
13. What is a variable and what is meant by the “value” of a variable?
14. What is an unsigned integer constant?
15. Define operator.
16. What is Assignment operator?
17. What are the Arithmetic Expressions?
18. What are the Mathematical functions?
19. What is character set?
20. What is constant?

FIVE MARKS

21. Define the basic structure of C programs.
22. Write short notes of following questions.

i) Constant ii) Variable iii) Data types.

23. What is character set? Explain the group of character set.
24. What is C TOKEN? Explain its types.

25. Define the types of constant.

26. What you about real constant?

27. Define data types. Explain primary data types.

28. Explain declaration of variables.

29. What you about operators? Explain any three operators.

30. What are they special operators? Explain that.

TEN MARKS

31. What are arithmetical expressions? Explain.

32.What is reading a character? Write program for uses of getchar fell.

33. Explain detailed for any three operators with examples.

34. Detailed explain basic structure of C program.

35. Write a note of following questions.

    i) Character set

    ii) Variables

    iii) C token

    iv) Data type

    v) key words

36. Explain: Mathematical function with simple program.

37. Write an assembly language program to increment and Decrement operator.

38. Write a program for Arithmetic operators.

39. Write an assembly language program to Arithmetic expression.

40. Explain: i) Symbolic constant ii) Assigning values and variables.

UNIT –V

(PRELIMINARIES AND FUNCTIONS)

Choose the correct answer:

1. Any C program

   A) Must contain at least one function

   B) Need not contain any function

   C) Needs input data

   D) None of the above

2. The recursive functions are executed in a _____

   A) Parallel order

   B) First in first out order

   C) Last in first out order

   D) Random order

3. Linker generates_____ files

   A) Object code

   B) Executable code

   C) Assembly code

   D) None of the above

4. Choose the function that is most appropriate for reading in a multi-word string?

   A) Strnset ()

   B) scanf ()

   C) strch ()

   D) Gets ()

5. Is the following statement a declaration or definition? Extern int i;

   A) Declaration

B definition

C) Function

D) Error

6. Identify which of the following are declarations

1: extern int X;

2: float square (floatX) {…..}

3: double pow(double, double);

A) .1

B) 2

C) 1 and 3

D) 3

7. When we mention the prototype of a function?

A) Defining

B) Declaring

C) Prototyping

D) Calling

8. The keyword used to transfer control from a function back to the calling function is

A) Switch

B) Go to

C) Go back

D) Return

9. What is (void*) 0?

A) Representation of NULL pointer

B) Representation of void pointer

C) Error

D) None of above

10. The feature of C language

A) C language is a portable language

B) Support a no. of data type.

C) C compiler produces very fast object code.

D) All the above

ANSWERS:

1(A) 2(C) 3(B) 4(D) 5(A) 6(C) 7(B) 8(D) 9(A) 10(D)

TWO MARKS

11. Explain the background of C.
12. What are the features of C?
13. Explain the structure of C program.
14. How to initialization of array?
15. Write different between “while” and “do… while” statement.
16. Explain array elements with example.
17. What is data input?
18. What is getchar?
19. What is putchar?
20. Define scanf and printf.

FIVE MARKS

21. Explain the two-dimensional array.

22 Draw a flow chart for looping statement.

23. What is expression? Explain with suitable example.
24. Discuss the relationship between pointer and arrays.
25. Discuss the relationship between pointer and function.

26 Explain how you will be accessing and initialize a pointer variable.

27. Explain the following function with examples

i) getchar () ii) putchar () iii) get c () iv) put c () v) gets () vi) put s ()

28. Explain the control statement with example.

29. Explain “if…. else” statement with examples.

30. Explain decision making statement.

TEN MARKS

31. Write a note of difference between “while loop” and “do… while loop”, with simple example.

32 What is unconditional statement? Explain its types with example program.

33. What is Array? Explain one dimensional and two-dimensional arrays with example program.

34. Briefly explain classifications of function.

35. Explain: decision making and branching, with example.

36. Explain multidimensional array with simple program.

37. Write a simple program for following functions.

i) if ii) if…. else iii) else if ladder

38. Write an assembly language program for following question

i) One dimensional Array ii) Multidimensional array

39. Explain: Initializations of a array using by for…. loop.

40. Explain any two unary operators available in C language.

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