

MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-I

ASSIGNMENTS

(July - 2021 & January - 2022)

**MCS-011, MCS-012, MCS-013, MCS-014, MCS-015,
MCSL-016, MCSL-017**



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110068**

CONTENTS

Course Code	Assignment No.	Submission-Schedule		Page No.
		For July-December Session	For January-June Session	
MCS-011	MCA(I)/011/Assignment/21-22	31 st October, 2021	15 th April, 2022	3
MCS-012	MCA(I)/012/Assignment/21-22	31 st October, 2021	15 th April, 2022	5
MCS-013	MCA(I)/013/Assignment/21-22	31 st October, 2021	15 th April, 2022	9
MCS-014	MCA(I)/014/Assignment/21-22	31 st October, 2021	15 th April, 2022	11
MCS-015	MCA(I)/015/Assignment/21-22	31 st October, 2021	15 th April, 2022	12
MCSL-016	MCA(I)/L-016/Assignment/21-22	31 st October, 2021	15 th April, 2022	15
MCSL-017	MCA(I)/L-017/Assignment/21-22	31 st October, 2021	15 th April, 2022	16

Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to MCA Programme Guide.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the MCA Programme Guide.
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-011
Course Title	:	Problem Solving and Programming
Assignment Number	:	MCA(I)/011/Assign/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	31stOctober, 2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

There are seven questions in this assignment which carries 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: Draw a flow chart and write an interactive program which prompts the user with the following options on the opening menu:

- 1) Add two integers
- 2) Compare two integers for the larger
- 3) Test an integer for odd or even
- 4) Quit

Enter your choice:

If an “1” is entered, prompt for the input of two integers and display their sum. If “2” is entered, prompt for two integers and display the larger of the two. If “3” is entered, prompt the user for one integer and print out if it is odd or even. If “4” is entered, exit the program. If the user enters any letters or numbers other than the choice, redisplay the prompt. All output should go to the terminal and all input should come from the keyboard.

(20 Marks)

Q2: Write a program with three functions besides *main()*. The *first function* will have two arguments - a character array and a short integer which holds the size of the array. With this function, initialize the elements of the array to the characters of the alphabet, beginning with the letter entered at the keyboard and ending with lower case “z”. Thus, if the character entered is an 'a', then the array will have 26 characters (the whole alphabet) stored into it. The *second function* will have three arguments - the character array which was initialized by the first function, the number of characters actually stored into the array, and an integer array (short) which is the same size as the maximum size of the character array. Set each element of the short integer array equal to the decimal value of the alphabetic characters in the character array. In the *third function*, print the characters in the character array to the standard output using the *putchar()*, built-in function, along with the decimal value of that character using the *fprintf()* function (use *stdout* for the *fp* argument). The output should look like:

```
a 97
b 98
c 99
etc.
```

(10 Marks)

- Q3:** Write an interactive program using strings which:
- a) gets a filename from the standard input (keyboard) or a file
 - b) gets a mode (read or write) from the same source and,
 - c) copies the contents of the input file to:
 - (i) the standard output if the input is from a file or
 - (ii) to the file specified in a) if the mode from b) is write
- (10 Marks)**

If the file won't open, direct the input/output to the corresponding standard file (stdin/stdout).

- Q4:** Write a program which has 7 functions. The functions should be:
main() this calls the other 6 functions namely:

fget_long() a function which returns a long data type from a file
fget_short() a function which returns a short integer variable from a file
fget_float() a function which returns a floating point variable from a file
fprt_long() a function which prints its single, long argument into a file
fprt_short() a function which prints its single, short argument into a file
fprt_float() a function which prints its single, floating point argument into a file

You should use *scanf()* to get the values of the variables from the input (the keyboard) and *printf()* to print the values to the terminal. Pay attention to using the correct format for each of the data types. If you have a compiler that only knows double, use double in place of float - or use it anyway if you want.

(10 Marks)

- Q5:** Modify question 5 to use strings input from the keyboard for the input and output file names. The program should prompt for an input filename and an output filename. These names should be stored in arrays with a *NULL* terminating character and the array names used as arguments to the *fopen()* function in place of the filename constants (like "a2.c" and "a2out.c") used in question 5.

Also prompt for and input the modes ("r" or "w") using the same string function. Remember that, even though the 'r' and 'w' are single characters, the mode is a string with a *NULL* at the end.

(10 Marks)

- Q6:** Write an interactive C program which illustrates the following concepts:

- (i) Function with no arguments and no return value.
- (ii) Function with arguments and no return value.
- (iii) Function with arguments and with return value.

(10 Marks)

- Q7:** Mention the type of applications which can be developed using C language. Also, list the latest C compilers that are available in the market by giving the details like the name of the compiler, version, vendor's name, DOS based /WINDOWS based / Others, year of release, etc..

(10 Marks)

Course Code	:	MCS-012
Course Title	:	Computer Organisation and Assembly Language Programming
Assignment Number	:	MCA(I)/012/Assign/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

There are four questions in this assignment, which carries 80 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Answer to each part of the question should be confined to about 300 words. Make suitable assumption, if any.

Q1:

(a) Please refer to Figure 4 of Unit 1 of Block 1 on page 11 of Instruction execution example. Assuming a similar machine is to be used for execution of the following three consecutive instructions:

LDA A ; Load the content of Memory location A into the Accumulator Register.

ADD B ; Add the content of memory location B from Accumulator Register.

STR C ; Stores the content of Accumulator register to memory location C.

However, this machine is different from the example of Figure 4 in the following ways:

- Each memory word of this new machine is of 32 bits in length.
- Each instruction is of length 32 bits with 16 bits for operation code (opcode) and 16 bits for specifying one direct operand.
- The Main Memory of the machine would be of size 64 KB.
- The three consecutive instructions are placed starting from memory location $(200E)_h$; operand A is at location $(500A)_h$ and contains a value $(00010056)_h$, Operand B is at location $(500B)_h$ and contains a value $(0122A0EE)_h$ and operand C is at location $(500C)_h$ and contains a value $(00000000)_h$.
- The AC, IR and MBR registers are of size 32 bits, whereas PC and MAR registers are of size 16 bits. The initial content of PC register is $(200E)_h$

Draw the diagrams showing the following information:

(i) Initial State of the machine with the addresses and content of memory locations in hexadecimal. Show only those address locations of the memory that store the instruction and data. Also show content of all the stated registers. **(2 Marks)**

(ii) Draw three more diagrams, each showing the state of machine after execution of every instruction viz. LDA, ADD and STR. Show the changes in the values of Registers and memory locations, if any, due to execution of instruction. Show all the addresses and values in hexadecimal notations. **(3 Marks)**

(b) Perform the following conversion of numbers: **(2 Marks)**

- Decimal $(3216547890)_{10}$ to binary and hexadecimal
- Hexadecimal $(666777888)_h$ into Octal.
- String "MCS12 is part of BCA" into UTF 8
- Octal $(8673451)_o$ into Decimal

(c) Simplify the following function using K-map: $F(A, B, C, D) = \Sigma (2, 3, 6, 7, 10, 14)$
Draw the circuit for the function using NAND gates. **(2 Marks)**

- (d) Consider the Adder-Subtractor circuit as shown in Figure 3.15 page 76 of Block 1. Explain how this circuit will perform subtraction (A-B), if the value of A is 0111 and B is 0001. You must list all the bit values including Cin and Cout and overflow, if any. **(1 Mark)**
- (e) Explain the functioning of a 3×8 Decoder. You should draw its truth table and explain its logic diagram with the help of an example input. **(2 Marks)**
- (f) Assume that a source data value 0111 was received at a destination as 0101. Show how Hamming's Error-Correcting code bits will be appended to source data, so this error of one bit is identified and corrected at the destination. You may assume that transmission error occurs only in the source data and not the source parity bits. **(2 Marks)**
- (g) Explain functioning of D flip flop with the help of a logic diagram and characteristic table. Also explain the excitation table of this flip-flop. **(2 Marks)**
- (h) Explain the functioning of an edge triggered flip-flop and a 4×1 multiplexer with the help of a diagram of each. **(2 Marks)**
- (i) Represent $(-34.0625)_{10}$ and $(0.000000000125)_{10}$ in IEEE 754 single precision and double precision formats. **(2 Marks)**

Q2:

- (a) Refer to the Figure 2(b) on page 8 in Unit 1 of Block 2. Draw the Internal organisation of a 64×8 RAM. Explain all the Input and Output of this organisation. Also answer the following:
 (i) How many data input and data output lines does this RAM needs? Explain your answer.
 (ii) How many address lines are needed for this RAM? Give reason in support of your answer. **(2 Marks)**
- (b) A computer has 16 MB RAM with each memory word of 32 bits. It has cache memory having 512 blocks having a size of 128 bits (4 memory words). Show how the main memory address $(CA30FB)_h$ will be mapped to cache address, if
 (i) Direct cache mapping is used
 (ii) Associative cache mapping is used
 (iii) Two way set associative cache mapping is used.
 You should show the size of tag, index, main memory block address and offset in your answer. **(3 Marks)**
- (c) What is the need of I/O interface in a computer? What are the functions of I/O interface? Explain the structure of I/O interface with the help of a diagram. **(3 Marks)**
- (d) What is Interrupt driven I/O? Explain with the help of a flowchart. Differentiate between the working of Interrupt driven I/O and Programmed I/O. **(2 Marks)**
- (e) Assume that a disk has 512 tracks, with each track having 128 sectors and each sector is of size 8 M bits. The cluster size in this system can be assumed to be as 8 sectors. A file having the name *assignmentofsemester1.txt* is of size 512 MB. Assume that disk has 128 free - continuous clusters. How can this file be allotted space on the disk? Also show the content of FAT after the space allocation to this file. You may make suitable assumptions. **(4 Marks)**
- (f) Explain the following, giving their uses and advantages/disadvantages.
 (Word limit for answer of each part is 50 words ONLY) **(6 Marks)**
- (i) External Communication Interfaces of computers
 - (ii) Keyboard technology
 - (iii) DVD-ROM

- (iv) DMA
- (v) Video Memory
- (vi) LCD Monitor Technology

Q3:

(a) A uni-processor system, having single core, has 8 general purpose registers. The machine has 256-byte RAM. The size of every register and memory word is 16 bits. The computer uses fixed length instructions of size 16 bits each. An instruction of the machine can have only one operand, which can be either a direct memory operand or a register operand. Both these operands use direct addressing. An instruction of a machine consists of bits for operation code, one bit for addressing mode, and bits for memory operand or register operand. The machine has about 128 different operation codes. The addressing mode bits specifies addressing mode as:

Addressing mode bit	Register Operand	Memory Operand
0	-	Direct
1	Direct	-

The special purpose registers, which are other than general purpose registers, are - Program Counter (PC), Memory Address Register (MAR), Data Register (DR) and Flag registers (FR). The first register of the general-purpose registers can be used as Accumulator Register. The size of Integer operands on the machine may be assumed to be equal to the size of accumulator register. In order to execute instructions the machine has another special register called Instruction Register (IR) of size 16 bits, as each instruction is of this size. Perform the following tasks for the machine. (Make and state suitable assumptions, if any.)

(i) Design suitable instruction formats for the machine. Specify the size of different fields that are needed in the instruction format. Also indicate how many bits of the instructions are unused for this machine. Explain your design of instruction format. Also indicate the size of each register. **(3 Marks)**

(ii) List at least two valid instructions; put some valid data values in registers and memory locations; and demonstrate examples of different addressing modes for this machine. **(2 Marks)**

(iii) Assuming that the instructions are first fetched to Instruction Register (IR), memory operand is brought to DR register and result of an operation is stored in the Accumulator register; write and explain the sequence of micro-operations that are required to fetch and execute an instruction, which performs addition of register operand to the accumulator register. Make and state suitable assumptions, if any. **(5 Marks)**

(b) Assume that you have a machine, as shown in section 3.2.2 of Block 3 having the micro-operations given in Figure 10 on page 62 of Block 3. Consider that R1 and R2 both are 8 bit registers and contains 11110000 and 00110110 respectively. What will be the values of select inputs, carry-in input and result of operation (including carry out bit) if the following micro-operations are performed? (For each micro-operation you may assume the initial value of R1 and R2 as given above) **(2 Marks)**

- (i) Decrement R1
- (ii) Add R1 and R2 with carry
- (iii) AND R1 and R2
- (iv) Shift right R1

(c) Consider that an instruction pipeline has only three stages namely instruction fetch and decode (IFD), Operand Fetch (OF) and Instruction execute and store results (IES). Draw an instruction pipeline diagram showing execution of 5 sequential instructions. What are the problems of this instruction pipelining? **(3 Marks)**

- (d) Explain the functioning of Wilkes control unit with the help of a diagram. Also differentiate between Hardwired control and micro-programmed control. **(2 Marks)**
- (e) Explain the characteristics of a RISC machine. RISC machines, in general, have large register file. How can this register file be used for parameter passing? Explain with the help of a diagram. What are the advantages of using instruction pipelining in a RISC processor? **(3 Marks)**

Q4:

- (a) Write a program using 8086 assembly Language (with proper comments) that accepts a two-digit input from the keyboard, converts it into an equivalent binary number and subtracts this value from every element of an array of length ten bytes. Assume that the array is stored in the memory. Make suitable assumptions, if any. **(7 Marks)**
- (b) Write a NEAR subroutine using 8086 assembly Language (with proper comments) that returns the smallest byte value in a byte array of length 5-bytes. The array is declared in the calling program and the base address of the array is passed to the subroutine in the stack. You should write both the calling program and subroutine. **(7 Marks)**
- (c) Explain the following in the context of 8086 Microprocessor: **(6 Marks)**
- (i) Physical address calculation in code and data segment
 - (ii) Interrupt vector table and its use
 - (iii) Based Indexed addressing mode with the help of an example

Course Code	:	MCS-013
Course Title	:	Discrete Mathematics
Assignment Number	:	MCA (I)/013/Assign/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	31stOctober, 2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

There are eight questions in this assignment, which carries 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1:

- (a) What is proposition? Explain different logical connectives used in proposition with the help of example. **(3 Marks)**
- (b) Make truth table for followings. **(4 Marks)**
- $p \rightarrow (q \wedge r) \wedge p \wedge \sim q$
 - $p \rightarrow (\sim r \vee \sim q) \wedge (p \wedge r)$
- (c) Give geometric representation for followings: **(3 Marks)**
- $\mathbb{R} \times \{3\}$
 - $\{1, 5\} \times \{3, -2\}$

Q2:

- (a) Draw a Venn diagram to represent followings: **(3 Marks)**
- $(A \cap B \cup C) \cup (A \cap B \cap C)$
 - $(A \cap B \cup C) \cap (A \cup B \cap C)$
- (b) Write down suitable mathematical statement that can be represented by the following symbolic properties. **(2 Marks)**
- $(\exists x)(\forall y)(\forall z) Q$
 - $\forall (z)(\forall y)(\exists z) P$
- (c) Show whether $\sqrt{5}$ is rational or irrational. **(3 Marks)**
- (d) Explain circular permutation with the help of an example. **(2 Marks)**

Q3:

- (a) Make logic circuit for the following Boolean expressions: **(6 Marks)**
- $(x' y z') + (xyz)'$
 - $(x'y)(yz')(yz')$
 - $(xyz) + (x'y'z)$
- (b) What is a tautology? If P and Q are statements, show whether the statement $(P \rightarrow Q) \vee (Q \rightarrow P)$ is a tautology or not. **(4 Marks)**

Q4:

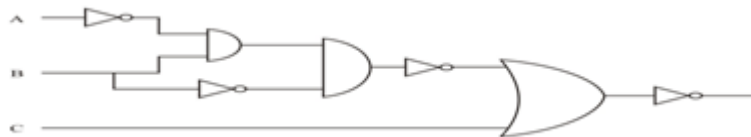
- (a) How many different committees of 6 professionals can be formed, if each committee contains at least 1 Professor, at least 2 Technical Managers and 1 Database Experts from list of 6 Professors, 5 Technical Managers and 8 Database Experts? **(4 Marks)**
- (b) What are Demorgan's Law? Explain the use of Demorgan's law with the help of example. **(4 Marks)**
- (c) Explain addition theorem in probability. **(2 Marks)**

Q5:

- (a) How many ways are there to distribute 15 distinct objects into 5 distinct boxes with:
- At least three empty box.
 - No empty box.
- (3 Marks)**
- (b) Find how many 3 digit numbers are even? **(3 Marks)**
- (c) Set A,B and C are: $A = \{1, 2, 3,4, 5,7,8,9,11,17\}$, $B = \{1,2, 3,4, 5,9,11, 12\}$ and $C = \{2, 3,5,7,9,10,11,12,13\}$.
- Find $A \cap B \cup C$, $A \cup B \cup C$, $A \cup B \cap C$ and $(B \sim C)$ **(4 Marks)**

Q6:

- (a) How many words can be formed using letter of TEACHER using each letter at most once?
- If each letter must be used,
 - If some or all the letters may be omitted.
- (3 Marks)**
- (b) Find boolean expression for the output of the following logic circuit. **(3 Marks)**



- (c) Prove that $1^2 + 2^2 + 3^2 + \dots + n^2 = n(n+1)(2n+1)/6$; $\forall n \in \mathbb{N}$ **(4 Marks)**

Q7:

- (a) What is principle of duality? Explain with example. **(3 Marks)**
- (b) What is power set? Write power set of set $A = \{1,2,3,4,7,9,11\}$. **(3 Marks)**
- (c) What is a function? What is domain and range of a function? Explain with example. **(4 Marks)**

Q8:

- (a) Find inverse of the following functions **(3 Marks)**

i) $f(x) = \frac{x^3 + 2}{x - 3} \quad x \neq 3$

- (b) Explain equivalence relation with example. **(3 Marks)**
- (c) Prove that the inverse of one-one onto mapping is unique. **(2 Marks)**
- (d) What is counterexample? Explain with an example. **(2 Marks)**

Course Code : **MCS-014**
Course Title : **Systems Analysis and Design**
Assignment Number : **MCA(I)/014/Assignment/2021-2022**
Maximum Marks : **100**
Weightage : **25%**
Last Dates for Submission : **31stOctober, 2021 (For July, 2021 Session)**
15th April, 2022 (For January, 2022 Session)

This assignment has three questions of 80 marks. Rest 20 marks are for viva voce. Answer all questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

- Q1:** Develop SRS for an **Online Vaccination Management System**. SRS should be as per IEEE standard SRS template. Make necessary assumptions. **(30 Marks)**
- Q2:** Draw the DFDs upto 3rd level for **Online Vaccination Management System**. **(30 Marks)**
- Q3:** Draw ERD for an **Online Vaccination Management System**. Make necessary assumptions. **(20 Marks)**

Course Code	:	MCS-015
Course Title	:	Communication Skills
Assignment Number	:	MCA(I)/015/Assign/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	31stOctober, 2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

This assignment has eight questions. Answer all questions. Assignment is for 100 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1:

Read the following passage and answer the questions given below:

Time management has become one of the key issues of the second half of the twentieth century. Managers, grappling with work pressures and deadlines, have come to recognize that time is a precious commodity to be ‘saved’, ‘gained’, and not ‘wasted’ or ‘lost’. But if time is a commodity, how then can we best describe, measure and manage it?

To describe and manage it, imagine a line that goes back to the beginnings of creation and continues into the mists of the future. And on that line are a number of significant marks-these separate the past from the present from the future. And within each time zone-past, present and future-we can differentiate periods of time from points of time. For example, the 1980s gave us a period of rapid economic growth; black Monday was a point of sudden financial catastrophe.

How can this brief analysis help the international manager? Firstly, there is the link between past, present and future. In other words, historical performance should be a guide to the future, and the present ought to represent last year’s forecast. So change-that which normally differentiates any two periods on our continuum - can be seen as a gradual evolution rather than a dramatic revolution.

Secondly, the use of a time-planning system, on which key points and periods are plotted, enables managers to organize their activities so that bottlenecks can be avoided and deadlines can be met. So stress, where the jobs to be done exceed the available time, can be reduced to an acceptable and productive level.

i. ***Tick the right choice:***

Time management was one of the major issues

- a) in the beginning of the twentieth century
- b) in the latter part of the twentieth century
- c) in the twentieth century

(1 Mark)

ii. Give two reasons why managers are giving so much importance to time management.

(2 Marks)

iii. Explain the difference between period of time and point of time giving your own examples.

(4 Marks)

iv. Do you think time management can reduce stress? Discuss.

(3 Marks)

Q2:

Pick out words/phrases from the passage which have the following meanings.

(10 Marks)

- i. time when the world was made
- ii. area
- iii. latest time by which an activity must be completed.
- iv. step by step.
- v. article which can be bought and sold
- vi. make a division between two things
- vii. work very hard to solve a problem
- viii. unclear period of time
- ix. time or place when jobs cannot be carried out, usually because of other pressures
- x. terrible event.

Q3:

Put the verbs in brackets in their correct form.

(10 Marks)

We.....i.....(write) to tell you about the reorganization at Softsys. As youii.....(know), weiii.....(trade) for two years now andiv.....(establish) a reputation as a reliable local supplier of business software. On the one hand, the rapid growth in our business during this period.....v.....(give) us very good results; on the other, this increased business.....vi.....(now place) a lot of pressure on our organization. So, wevii.....(currently change) the structure of Softsys so that we can continue to provide the level of service and support that you, as a valued customer,viii.....(expect). Weix.....(not plan) any major changes; the company.....x.....(continue) to be owned and run by the three partners.

Q4:

You are looking for a job as software developer and your prospective employer asked you to prepare a presentation (PPT) on the following:

Your career so far along with your interested areas, expertise and details about the projects handled.

Note: You may use visual aids to support your presentation

(15 Marks)

Q5:

You have seen a job with a multinational company advertised in a national newspaper for the post of Systems Analyst position. Prepare a good biodata/resume to apply against it.

(15 Marks)

Q6:

A benefactor has given a sum of money to your school/college. One condition of the gift is that both students and staff must be involved in deciding how the money is to be used. A further condition is that the money must be spent on permanent and tangible things. You have been asked by the principal of the school/college to survey the views of staff and students and to present him/her with an information report. Write a report in about 250 words.

(20 Marks)

Q7:

Mark the stress in the following words:

(10 Marks)

- | | |
|-------------|------------|
| i) attend | attention |
| ii) believe | belief |
| iii) assist | assistance |

- iv) lovely loveliness
- v) commerce commercial

Q8:

Write short notes on the following:

(10 Marks)

- i) The essentials of Minutes of the Meeting.
- ii) Effective group discussions

Course Code	:	MCSL-016
Course Title	:	Internet Concepts and Web Design (Lab Course)
Assignment Number	:	MCA(I)/L016/Assign/2021-22
Maximum Marks	:	100 (including Lab Record Marks)
Weightage	:	25%
Last Dates for Submission	:	31stOctober, 2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

There are two questions in this assignment carrying a total of 40 marks. Your Lab Record will carry 40 Marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Submit the screenshots along with the coding and documentation.

Q1: (35 Marks)

A Book publisher maintains a website of the books published by them. The publisher site displays the list of the book title, authors, date of publishing and price. In addition, it also displays a form for the authors who want to publish book. Design and create four web pages for the website of the Publisher namely, *Home*, *Book_List*, *Author_Registration* Form and *Feedback*, having the following features:

For consistency, every web page of the website should consist of three basic divisions –

Header – This division should be of the same for all the four web pages and should display name and logo of the Publisher. This division should be in different background colour.

Navigation - This division should be same for every web page. It should contain links to all the web pages, viz. *Home*, *Book_List*, *Author_Registration* Form and *Feedback*.

Information - This division should display the basic information as given below. The web pages that you are designing should differ in this Division only.

The Information division of the different pages should be as under:

- *Home* page should include a Welcome message, information about the types of Books published by the publisher and contact details.
- *Book_List* page should display information about the books published by the publisher, viz. title, authors, date of publishing and price.
- *Author_Registration* page should contain a form, which should have fields - name of the author, email id, phone, proposed book title, expected time to complete the book and a Submit button. You should write JavaScript code to verify that all the fields are filled with some data. This code should be run when the submit button is pressed.
- *Feedback* page should display another form that has two input fields – Name of the person giving feedback and a text area for giving feedback; and a submit button.

Q2: (5 Marks)

How does the use of CSS help in maintenance of the site created by you? Explain the important features of Angular JS.

Course Code	:	MCSL-017
Course Title	:	C and Assembly Language Programming
Assignment Number	:	MCA(I)/L017/Assignment/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31stOctober,2021 (For July, 2021 Session) 15th April, 2022 (For January, 2022 Session)

This assignment has two sections. Answer all questions in each section. Each Section is of 20 marks. Your Lab Records will carry 40 Marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the programme guide for the format of presentation.

Note: You must execute the program and submit the program logic, sample input and output along with the necessary documentation. Assumptions can be made wherever necessary.

Section 1: C Programming Lab

Question 1:

(20 Marks)

Write an interactive C program for “Library Management System” which prompts the user with the following menu options on the opening menu and performs the corresponding functionalities:

- 1) Membership registration
(The data required for the registration is – a unique membership id, name of the member, type of membership, age, membership start date, membership end date and membership fee paid)
- 2) Current membersList
- 3) Books issued to a member, which are not yet returned
- 4) Fine due from members (per day fine Rs 5/-, if the book is returned late)
- 5) List of Members whose membership is expiring in the coming week.
- 6) Quit

Enter your choice:

Note: You must execute the program and submit the program logic, complete C code for the assignment question, sample input and output, screenshots along with the necessary documentation for this practical question. Make and state suitable assumptions, if any.

Section 2: Assembly Language Programming Lab

Question 1:

Design a two-bit counter circuit that counts from 0 to 3. It should have states: 00, 01, 10 and 11. The initial state of the counter may be assumed to be 11. The counter will be in following successive states: 11, 00, 01, 10, 11, 00, 01, 10, 11...Use J-K flip flops to design the circuit. You should design the circuit using state transition diagram and Karnaugh's maps.

(5 Marks)

Question 2:

Write and run following programs using 8086 assembly language.

(3×5 = 15 Marks)

- (a) Write and run a 8086 Assembly language program that converts a two digit packed BCD number stored in a byte locations in the memory, into an equivalent binary number. The output should be stored in AL register. For example, if the byte location contains a packed BCD '25', then the BCD number should be processed and converted to equivalent binary value, which is 00011001_2 . This result should be stored in AL register.
- (b) Write and run (using appropriate calling program) a near procedure in 8086 assembly language, which is passed a single parameter by the calling program. The procedure checks if the input parameter is an even number or not. If the input parameter is even then a value of 1 is returned to the calling program, else a value 0 is returned. The calling program based on the returned value prints "EVEN" or "ODD". You may assume that the parameter value would always be greater than or equal to 1. Make and state suitable assumptions, if any.
- (c) Write and run a 8086 assembly language program that finds the factorial of first N natural numbers. The value of N is input to the assembly program. The factorial value is stored in AX register. Assume that the value of N is between 1 and 5 only.