

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2023 & January - 2024)

ECO-02, MCS-011, MCS-012, MCS-015, MCS-013, BCSL-021, BCSL-022,



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068**

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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 BCA 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 BCA Programme Guide.

Course Code	:	ECO-02
Course Title	:	Accountancy-1
Assignment Number	:	BCA (II)/02/Assignment/2023-24
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2023 (For July Session)
	:	30th April, 2024 (For January Session)

There are six questions in this assignment which carried 100 marks. Answer all the questions. Please go through the guidelines regarding assignments given in the Program Guide for the format of presentation.

Attempt all the questions:

- Q1.** Define accounting and explain its scope, objectives advantages and limitations. (20)
- Q2.** Write about the Bank Reconciliation Statement, what are the main causes of difference. (20)
- Q3.** Write notes on the following concepts: (4x5=20)
- Going Concern Concept
 - Conservatism
 - Consistency
 - Materiality
- Q4.** Sohan drew on Mohan a bill for Rs. 1,500 for 3 months on June 1, 2023. The bill was endorsed to Rohan. On July 15, Mohan approaches Sohan to renew the bill for a period of three months and charges Rs. As interest. Sohan agrees to renew the bill. Mohan pays the amount of interest in cash and accepts a new bill for Rs. 1,500. The bill is honoured on the due date. Record these transactions in the books of various parties. (20)
- Q5.** From the following figures prepare Trading and Profit and Loss Account of Lakshmi & Co. for the year ended December 31, 1987. (20)

	Rs.
Stock on January 1, 1987	40,000
Purchases	98,000
Commission Received	650
Rent, Rates and Taxes	8,600
Salaries & Wages	12,000
Sales	1,62,100
Returns Inwards	2,400

Returns Outwards	3,000
Sunday Expenses	2,500
Bank Charges	50
Discount Received	750
Carriage on Purchases	2,000
Discount Allowed	530
Carriage on Sales	1,700
Lighting and Heating	2,200
Postage	300
Income from Investments	500
Commission Paid	1,000
Interest paid on a bank loan	550

The stock on December 31, 1987 was valued at Rs. 26,000.

Course Code	:	MCS-011
Course Title	:	Problem Solving and Programming
Assignment Number	:	BCA(II)/011/Assignment/2023-24
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2023 (For July Session) 30th April, 2024 (For January Session)

There are seven questions in this assignment, which carry 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.** Write an algorithm, draw corresponding flow chart and write an interactive program which prompts the user with the following options on the opening menu: **(15)**
- 1) To accept two integers and check whether they are equal or not
 - 2) To check whether a given number is even or odd
 - 3) To check whether a given number is a positive number or a negative number
 - 4) Quit
- Enter your choice:
- Note:** Use *SWITCH..CASE* statement.
- Q2.** Write the *functions* in C for the following: **(9)**
- (a) To find the square of any number.
 - (b) To find the absolute difference between two integers.
 - (c) To convert a decimal number to its equivalent binary number.
 - (d) To find the largest element in a given array of *n* elements.
- Q3.** Write an interactive program using **recursion** for each of the following: **(12)**
- (a) To count the digits of a given number.
 - (b) To reverse a string
 - (c) To find the least-common-multiple of two numbers.
- Q4.** Write interactive C programs to perform the following on strings: **(12)**
- (a) To find the length of a given string without using the string library functions.
 - (b) To compare two strings without using string library functions.
 - (c) To count the total number of vowels and consonants in a string and display the counts separately.
- Q5.** Write an interactive C program to insert new elements in the unsorted array. **(10)**
- Q6.** Using Structures in C, write an interactive program to display the mark-sheet and grade card for 10 students for a MOOC course. **(10)**
- Note:** Assumptions can be made wherever necessary and mention them.

Q7. Using File Handling concept in C programming, write the C programs for the following: **(12)**

- (a) To find the number of lines in a text file.
- (b) To delete specific line from a text file.
- (c) To copy a file to another folder with a different file-name.

Course Code	:	MCS-012
Course Title	:	Computer Organization and Assembly Language Programming
Assignment Number	:	BCA(II)/012/Assignment/2023-24
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2023 (For July Session) 30th April, 2024 (For January 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 the presentation. The answer to each part of the question should be confined to about 300 words. Make suitable assumptions, if any.

Q1. (a) Please refer to Figure 4 of Unit 1 of Block 1 on page 11 of the Instruction execution example. Assuming a similar machine is to be used for the execution of the following three consecutive instructions:

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

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

STOR 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 16 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 2^{16} words.
- The three consecutive instructions are placed starting from memory location $(11FE)_h$; operand A is at location $(1FFF)_h$ and contains a value $(4321)_h$, Operand B is at location $(2000)_h$ and contains a value $(1FFE)_h$ and operand C is at location $(2001)_h$ and contains a value $(0000)_h$.
- The AC, PC, MAR and MBR registers are of size 16 bits, whereas IR register is of size 32 bits. The initial content of the PC register is $(11FE)_h$.

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)
- (ii) Draw three more diagrams, each showing the state of machine after execution of every instruction viz. LOAD, ADD and STOR. 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)

- (b) Perform the following conversion of numbers: (2)
- Decimal $(345654398)_{10}$ to binary and hexadecimal
 - Hexadecimal $(FFEEDDCBA)_h$ into Octal.
 - String “Computer Organisation” into UTF 8
 - Octal $(6754632)_o$ into Decimal
- (c) Simplify the following function using K-map: $F(A, B, C, D) = \Sigma (1, 3, 4, 7, 11, 13)$
Draw the circuit for the resultant function using NAND gates. (2)
- (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 1011 and B is 0011. You must list all the bit values including Cin and Cout and overflow, if any. (1)
- (e) Explain the functioning of a 3×8 decoder with the help of logic diagram and example input. (2)
- (f) Assume that a source data value 1011 was received at a destination as 1010. Show how Hamming's Error-Correcting code bits will be appended to source data to identified and correct the error of one bit at the destination. You may assume that transmission error occurs only in the source data and not the source parity bits. (2)
- (g) Explain the functioning of the D flip-flop and the T flip-flop with the help of a logic diagram and characteristic table. Also, explain the excitation table of this flip-flop. (2)
- (h) Explain the functioning of the edge-triggered flip-flop with the help of a diagram. (2)
- (i) Represent $(-121.25)_{10}$ and $(0.0625)_{10}$ in IEEE 754 single precision and double precision formats. (2)
- Q2.** (a) Refer to the Figure 2(b) on page 8 in Unit 1 of Block 2. Draw the Internal organisation of an 8×8 RAM. Explain all the Input and Output of this organisation. Also answer the following: (2)
- How many data input and data output lines does this RAM needs? Explain your answer.
 - How many address lines are needed for this RAM? Give reason in support of your answer.
- (b) A computer has 64 K Word RAM with each memory word of 16 bits. It has cache memory having 32 blocks having a size of 32 bits (2 memory words). Show how the main memory address $(1AFC)_h$ will be mapped to the cache address, if (3)
- Direct cache mapping is used
 - Associative cache mapping is used
 - 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.
- (c) What is an Interrupt? Why are interrupts used in a computer? Explain different kinds of interrupts. Also, explain the process of interrupt processing. (3)
- (d) What is an I/O processor? Explain the selector channel structure in the context of the I/O processor. How is an I/O processor different from DMA? (2)

- (e) Assume that a disk has 32 tracks, with each track having 16 sectors and each sector is of size 512 Kilobytes. The cluster size in this system can be assumed to be as 2 sectors. A file having the name *mcs012.txt* is of size 16 MB. Assume that it is a new disk, and the first 8 clusters are occupied by the Operating System. Rest all the clusters are free. How can this file be allotted space on this disk? Also, show the content of FAT after the space allocation to this file. You may make suitable assumptions. **(4)**
- (f) Explain the following, giving their uses and advantages/disadvantages, if needed. **(6)**
(Word limit for answer of each part is 50 words ONLY)
 - (i) Rotational Latency in disks
 - (ii) Programmed I/O
 - (iii) Resolution of Display and Printer
 - (iv) Zip Drive
 - (v) Power Supply
 - (vi) Keyboard and Mouse

- Q3.** (a) A single-core uniprocessor system has 8 General purpose registers. The machine has RAM of size 64K memory words. The size of every general-purpose register and memory word is 16 bits. The computer uses fixed-length instructions of size 32 bits each. An instruction of the machine can have two operands. One of these operands is a direct memory operand and the other is a register operand. An instruction of a machine consists of bits for operation code, bits for memory operand and bits of register operand. The machine has about 128 different operation codes. 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 among 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 the accumulator register. To execute instructions, the machine has another special register called Instruction Register (IR) of size 32 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 the instruction format. Also, indicate the size of each register. **(3)**
 - (ii) Demonstrate two valid instructions of the machine; put some valid data values in registers and memory locations and show these two instructions. **(2)**
 - (iii) Assuming that the instructions are first fetched to the Instruction Register (IR), the memory operand is brought to the DR register and the 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 addition instruction that adds the contents of the memory and register operands of the instruction. The result is stored in the accumulator register. Make and state suitable assumptions, if any. **(5)**

- (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 contain 11100111 and 00111100 respectively. What will be the values of select inputs, carry-in input, and the result of the 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)**
- (i) Decrement R1
 - (ii) Add R1 and R2 with Carry
 - (iii) Exclusive OR of the registers R1 and R2
 - (iv) Shift right R1
- (c) Consider that an instruction pipeline has three stages namely instruction fetch and decode (FD), Operand Fetch (OF) and Instruction Execute and store results (ES). Draw an instruction pipeline diagram showing the execution of five sequential instructions using this pipeline. What are the problems with this instruction pipelining? **(3)**
- (d) Explain the functioning of the Wilkes Control Unit. Also, explain the format of the control memory with the help of a diagram. **(2)**
- (e) Explain the characteristics of RISC? Also, explain the RISC pipelining. **(3)**
- Q4.** (a) Write a program using 8086 assembly Language (with proper comments) that accepts three different digits as input from the keyboard. Each digit is first converted to a binary equivalent. The binary values of these three digits are compared and the middle value is put in the AL register. This AL register is multiplied with each value of a byte array of size 6, which is stored in the memory. The result of the multiplication is stored in the same memory location. You may assume the byte array has the values 02h, 06h, 08h, 03h, 01h, 05h. Make suitable assumptions, if any. **(7)**
- (b) Write a NEAR subroutine using 8086 assembly Language (with proper comments) that returns the average value of the values stored in a byte array of length 3. All three values of the byte array are passed to the subroutine in the stack. You should write both the calling program and subroutine. **(7)**
- (c) Explain the following in the context of 8086 Microprocessor with the help of an example or a diagram: **(6)**
- (i) Use of code segment and stack segment registers for computing the respective 20-bit addresses.
 - (ii) Any 4 flags of the flag register of 8086 micro-processor
 - (iii) Any four shift instructions of 8086 micro-processor

Course Code	:	MCS-015
Course Title	:	Communication Skills
Assignment Number	:	BCA(II)/015/Assignment/2023-24
Maximum Marks	:	100
Weightage	:	25%
Last date of submission	:	31st October, 2023 (For July Session) 30th April, 2024 (For January Session)

This assignment has seven questions. 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. Read the following passage carefully.

Nobody actually wants to cause offence but, as business becomes ever more international, it is increasingly easy to get it wrong. There may be a single European market but it does not mean that managers behave the same in Greece as they do in Denmark.

In many European countries handshaking is an automatic gesture. In France good manners require that on arrival at a business meeting a manager shakes hands with everyone present. This can be a demanding task and, in a crowded room, may require gymnastic ability if the farthest hand is to be reached.

Handshaking is almost as popular in other countries—including Germany, Belgium and Italy. But Northern Europeans, such as the British and Scandinavians, are not quite so fond of physical demonstrations of friendliness.

In Europe the most common challenge is not the content of the food, but the way you behave as you eat. Some things are just not done. In France it is not good manners to raise tricky questions of business over the main course. Business has its place after the cheese course. Unless you are prepared to eat in silence you have to talk about something —something, that is, other than the business deal which you are continually chewing over in your head.

Italians give similar importance to the whole process of business entertaining. In fact, in Italy the biggest fear, as course after course appears, is that you entirely forget you are there on business. If you have the energy, you can always do the polite thing when the meal finally ends, and offer to pay. Then, after a lively discussions, you must remember the next polite thing to do—let your host pick up the bill.

In Germany, as you walk sadly back to your hotel room, you may wonder why your apparently friendly hosts have not invited you out for the evening. Don't worry, it is probably nothing personal. Germans do not entertain business people with quite the same enthusiasm as some of their European counterparts.

The Germans are also notable for the amount of formality they bring to business. As an outsider, it is often difficult to know whether colleagues have been working together for 30 years or have just met in the lift. If you are used to calling people by their first names this can be a little strange. To the Germans, titles are important. Forgetting that someone should be called *Herr*

Doktor or Frau Direktorin might cause serious offence. It is equally offensive to call them by a title they do not possess.

In Italy the question of title is further confused by the fact that everyone with a university degree can be called *Dottore*-and engineers, lawyers and architects may also expect to be called by their professional titles.

These cultural challenges exist side by side with the problems of doing business in a foreign language. Language, of course, is full of difficulties — disaster may be only a syllable away. But the more you know of the culture of the country you are dealing with, the less likely you are to get into difficulties. It is worth the effort. It might be rather hard to explain that the reason you lost the contract was not the product or the price, but the fact that you offended your hosts in a light-hearted comment over an aperitif. Good manners are admired: they can also make or break the deal.

- i. Discuss the importance of culture in doing business in the light of the following statement from the text:

“----- as business becomes ever more international, it is increasingly easy to get it wrong.” (4)

- ii. How are the French different from the British, where ‘shaking hands’ is concerned? (2)
- iii. Suggest two ways in which the Italians differ from the Germans in their dealings with business colleagues. (2)
- iv. What title would you give the passage? (2)
- v. What would you tell a foreign visitor about “good manners” in our country? (4)
- vi. Find opposites of the following words from the text: (6)

- i. challenge
- ii. worry
- iii. animosity
- iv. friendliness
- v. difficulty
- vi. light-hearted

Q2. Use the phrasal verbs given in the box to complete the sentences given below: (10)

is over	call back	cut off	get through	give up
hang up	hold on	look up	pick up	put through

- i. The phone’s ringing. Why don’t you ----- the receiver?
- ii. I’m afraid she isn’t available at the moment. Can you ----- later?
- iii. Can you -----their number in the directory, please?
- iv. I’m afraid she’s with a client, shall I -----you ----- to her secretary?
- v. Hello? Are you still there? I think we were -----for a moment.
- vi. Mr. Green never seems to be in his office. I’ve been trying to -----to him all morning.
- vii. Could you ----- for a moment? I’ll just find out for you.
- viii.If the telephonist says ‘*Thanks you so much for calling*’ and plays me that awful electronic music again, I’ll -----.

- ix. If you get a wrong number, it's polite to say 'I'm sorry, I've dialed the wrong number' before you -----
- x. If an American telephonist asks 'Are you through?', she wants to know if your call -----

Q3. Put the verbs in brackets into the passive form in the following sentences. (10)

- i. You'll hardly recognize our office. It (redecorate) since your last visit.
- ii. Two players (send) off the field during last Saturday's match.
- iii. The hotel, which (complete) only last year (equip) with a business center and a gym.
- iv. Application (invite) for the post of Senior Lecturer in the Department of Architecture. Preference (give) to applicants with teaching experience.
- v. As my car (repair) last Friday, I (give) a lift to work by a colleague.
- vi. As soon as your order (receive), it (process) and an acknowledgment sent.

Q4. Write down *what you would say* in each of these situations. (10)

- i. Your flight to Delhi is delayed. Find out the reason.

- ii. You're booked on flight AI 879 on May 16. You want to postpone this to ZZ 857 on May 17.

- iii. Flight RA 372 doesn't leave till 5pm but you've arrived at the check-in desk at 12 noon.

- iv. You don't understand how to get a boarding-pass from an automatic machine. Ask a passer-by for help.

- v. Someone asks you how to get to the Terminal-3(Delhi Airport) –tell him or her that it's two blocks down and then left.

- vi. You have arrived late because your flights' delay. Apologize to your host or hostess.

vii. You don't understand some of the dishes on the menu. Ask your companion for help.

viii. You want to order a *plain dosa*, which is not on the menu.

ix. Ask your companion to recommend a local dish.

x. At the end of the meal you want to pay the bill, but the waiter has given it to your companion.

Q5. (a) What are the four phases in a negotiation process? Discuss. (5)

(b) Every New Year XYZ multinational company gives its customers gifts ranging from diaries and calendars to silver items. The financial manager of that MNC says it's too expensive and wants to stop the practice. The sales manager disagrees. Write a dialogue between the two.

(10)

Q6. You are the General Manager –HR of the company. You want to talk about the effective ways of making good presentations to the Sales staff. Use the following points to make your presentation. (15)

- How good presentations can benefit your company.
- How speakers should prepare before giving presentations
- The qualities of a good speaker
- How a speaker can keep the attention of the audience
- The effective use of visual aids in presentations

Q7. Imagine that your General Manager has asked you to find out the precautions and preparations needed to arrange for the disaster management provisions in your company. (20)

These are the notes you've made. Draft a report of about 300 words to your General Manager by expanding the notes into paragraphs.

Identified Dangers

- i. Fire— particularly in areas where a lot of paper is stored
- ii. Earthquake —cracks due to previous earthquake
- iii. Lightning —inadequate safety measures

Proposals

- i. Fire fighting equipment to be maintained regularly
- ii. Fire fighting training to the support staff
- iii. Display of safety regulations
- iv. Hooters to be installed —signal warning
- v. Exit outlets to be highlighted
- vi. Important telephone numbers —Hospital, Fire-Brigade, Doctors, senior officials of the company
- vii. Action committee to be formed

Course Code	:	MCS-013
Course Title	:	Discrete Mathematics
Assignment Number	:	BCA (II)/013/Assignment/2023-24
Maximum Marks	:	100
Last Date of Submission	:	31st October, 2023 (for July Session) 30th April, 2024 (for January Session)

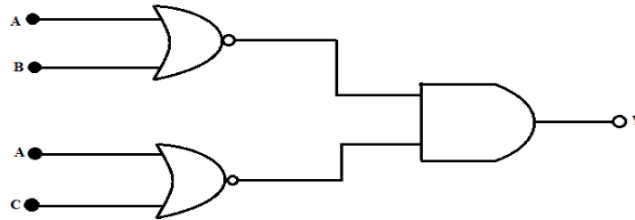
There are eight questions in this assignment, which carries 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

- Q1.** (a) What is Set? Explain use of Set with examples (3)
- (b) Make truth table for followings. (4)
- i) $p \rightarrow (\sim r \wedge q) \wedge (\sim p \vee r)$
- ii) $p \rightarrow (\sim r \vee \sim q) \vee (p \wedge \sim r)$
- (c) Give geometric representation for followings: (3)
- i) $\{5, -3\} \times \{-2, -2\}$
- ii) $\{-1, 3\} \times \{-2, 3\}$
- Q2.** (a) Draw Venn diagram to represent followings: (3)
- i) $(A \cap B \cap C) \cap (A \cap B \cap C)$
- ii) $(A \cap B \cap C) \cup (B \cup C)$
- iii) $(A \cap B \cup C)$
- (b) Write down suitable mathematical statement that can be represented by the following symbolic properties. (4)
- i) $(\exists x)(\exists y)(\exists z)P$
- ii) $\exists (z)(\exists y)(\forall z)Q$
- (c) Show whether $\sqrt{7}$ is rational or irrational. (3)
- Q3.** (a) Explain use of inclusion-exclusion principle with example. (2)
- (b) Make logic circuit for the following Boolean expressions: (4)
- i) $(xyz) + (xyz)' + (xz'y)$
- ii) $(x'yz)(xyz')(xy'z)$
- (b) What is a tautology? If P and Q are statements, show whether the statement (4)
- $(P \rightarrow Q) \vee (\rightarrow \sim P)$ is a tautology or not.
- Q4.** (a) How many words can be formed using letter of "EXCELLENT" using each letter at most once? (2)

- i) If each letter must be used,
ii) If some or all the letters may be omitted.
- (b) What is a relation? What are different types of relation? Explain equivalence relation with the help of example. (3)
- (c) Prove that $1^2 + 2^2 + 3^2 + \dots + n^2 = n(n+1)(2n+1)/6$; $\forall n \in \mathbb{N}$ (3)
- (d) What is counterexample? Explain its use with the help of an example. (2)
- Q5.** (a) How many different professional committees of 8 people can be formed, each containing at least 2 Doctors, at least 2 Public Servants and 1 IT Expert from list of 7 Doctors, 6 Public Servants and 6 IT Experts? (4)
- (b) A and B are mutually exclusive events such that $P(A) = 1/2$ and $P(B) = 1/3$ and $P(A \cup B) = 1/4$. What is the probability of $P(A \cap B)$? (2)
- (c) Find how many 3 digit numbers are odd? (2)
- (d) Explain whether the function $f(x) = x + 1$ is one-one or not. (2)
- Q6.** (a) How many ways are there to distribute 21 distinct items into 6 distinct boxes with: (3)
- i) At least two empty boxes.
ii) No empty box.
- (b) Explain principle of multiplication with an example. (3)
- (c) Three Sets A, B and C are: $A = \{1, 2, 3, 4, 5, 8, 9, 12, 15, 17\}$, $B = \{1, 2, 3, 4, 8, 9, 10\}$ and $C = \{1, 2, 7, 9, 10, 11, 13\}$. Find $A \cup B \cap C$; $A \cap \sim B \cup C$; $A \cap B \cup C$ and $(A \cap \sim C)$. (4)
- Q7.** (a) Explain addition theorem in probability. (3)
- (b) Make Pascal's triangle up to $n = 6$. (2)
- (c) What is a function? Explain different types of functions with example. (3)
- (d) Write the following statements in symbolic form: (2)
- (i) Mr. X is poor but happy.
(ii) Either eat healthy food or be ready for poor health.
- Q8.** (a) Find inverse of the following functions (3)

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

(b) Find dual of Boolean Expression for the output (Y) of the following logic circuit. (3)



(c) What is a proper subset ? Write the number of proper subsets of the Set

{a, b, c, d, e, f}. (2)

(d) “If it rains, then you will play”. Write inverse and contrapositive for this sentence. (2)

Course Code	:	BCSL-021
Course Title	:	C Language Programming
Assignment Number	:	BCA(II)/L-021/Assignment/2023-24
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	31st October, 2023 (for July Session) 30th April, 2024 (for January Session)

This assignment has only one question. Answer the question. This question carries 40 marks. Rest 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.

Q1. Write an interactive C program which prompts the user with the following options on the opening menu: **(40)**

- 1) General Information of the Learner Support Centre(LSC)
- 2) Programmes activated in the study centre
- 3) Scheduling of theory/practical sessions for BCA-MCA programmes
- 4) Academic Councillor's Details
- 5) Schedules for Assignment submissions for various programmes
- 6) Quit

Enter your choice:

If an "1" is entered, prompt the user to enter the study centre code and know the general details about the study like name of the learner support centre(LSC), name of the regional centre, name of the study centre coordinator, programme in-charge details etc. If "2" is entered, it should give the details of all the programmes those are activated in the LSC. If "3" is entered, it should give the schedules for the theory and practical counselling sessions for BCA and MCA programmes for the current session. If "4" is entered it should display the details of the academic councillors' associated with respective programmes. If "5" is entered it should display the assignments submission schedules for various programmes for the current session activated in that LSC. 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.

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

Course Code	:	BCSL-022
Course Title	:	Assembly Language Programming Lab
Assignment Number	:	BCA(II)/L-022/Assignment/2023-24
Maximum Marks	:	50
Weightage	:	25%
Last Dates for Submission	:	31st October, 2023 (For July Session) 30th April, 2024 (For January Session)

Note : This assignment has two questions of total of 40 marks. Rest 10 marks are for viva voce. Please go through the guidelines regarding assignments given in the programme guide for the format of presentation.

- Q1.** Design a two bit counter circuit that count from the state 00 to 10 only. The state 11 is ignored. The states of the counter, thus, may be 00, 01, 10, 00, 01, 10... Use J-K flip flop to design the circuit. You must design them using state transition diagram and Karnaugh's map. **(10)**
- Q2.** Perform the following using 8086 assembly language. **(3×10 = 30)**
- (a)** Write and run a program using 8086 assembly language that increments a byte value stored in a memory location by a value 2. The result should be stored in the same memory location. For example, if a memory location contains 0101 0001, then the program will add 2 to this value and store the result 0101 0011 (after adding 2) in the same location. 20
- (b)** Write and run a program using 8086 assembly language which finds the highest of four byte values stored in memory. The highest value should be left in AL register.
- (c)** Write and run a program using 8086 assembly language that compares the values. of AL and BL registers. In case AL is more than BL, then program clears BL register otherwise it clears AL register. You can move value '1100 1010' in AL, register and '1100 1000' in BL register, initially.