BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2024 & January - 2025)

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/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2024 (For July Session)**
	:	**30th April, 2025 (For January Session)**

There are five 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: From the following figures prepare Trading and Profit and Loss Account of Lakshmi & Co. for the year ended December 31, 2023. **(20)**

	Rs.
Stock on January 1, 2023	40,000
Purchases	98,000
Commission Received Rent	650
Rates and Taxes	8,600
Salaries & Wages	12,000
Sales	1,62,100
Returns Inwards	2,400
Returns Outwards	3,000
Sundry 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	550

The stock on December 31, 2023 was valued at Rs. 26,000

Q2: Distinguish between: **(4x5=20)**

a) Non-recurring and Recurring Expenses
b) Ordinary Commission and Del Credere Commission
c) Account Sales and invoice
d) Normal Loss and Abnormal Loss

Q3: Explain the accounting concepts which guide the accountant at the recording stage. **(20)**

Q4: a) What is a Single-Entry System? State its features and limitations. **(20)**
b) Distinguish Single-Entry System from Double-Entry System.

Q5: Define Depreciation. Explain the need and significance of depreciation. What factors should be considered for determining the amount of depreciation? **(20)**

Course Code	**:**	**MCS-011**
Course Title	**:**	**Problem Solving and Programming**
Assignment Number	**:**	**BCA(II)/011/Assignment/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2024 (For July Session)** **30th April, 2025 (For January Session)**

There are eight questions in this assignment. Each question carries 10 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.

Question 1:

Discuss the differences between iterative and recursive approaches in solving problems. Write C programs to compute the factorial of a number using both iterative and recursive methods. Compare their performance and memory usage.

Question 2:

Write a C program to find the sum of all elements in an array.

Question 3:

Write a C program to perform division on 2 matrices A and B of size NXN and store the result in matrix C.

Question 4:

Without using the built-in string functions, write a C program to take a choice from the user (use a SWITCH statement) (i) to find the string length (ii) for string concatenation, (iii) string copy and (iv) string comparison.

Question 5:

Explain the concept of pointers in C and their various uses. Write a C program that uses pointers to perform operations on arrays, including finding the maximum and minimum values, and reversing the array. Discuss the advantages and potential pitfalls of using pointers.

Question 6:

What are structures in C, and how are they used? Write a C program that defines a structure to store student information (name, roll number, and marks) and includes functions to input, display, and sort the student records by marks. Explain the advantages of using structures for complex data.

Question 7:

Explain the concept of file handling in C. Write a C program to read data from a file, process the data (such as calculating the sum and average of numbers), and write the results to another file. Discuss the various modes of file opening and the importance of closing files.

Question 8:

Explain the role of preprocessor directives in C. Write a C program that uses macros to define constants and perform inline calculations. Discuss the use of conditional compilation directives to create a program that behaves differently based on defined macros. Analyze the benefits and limitations of using preprocessor directives in C programming.

Course Code	**:**	**MCS-012**
Course Title	**:**	**Computer Organisation and Assembly Language Programming**
Assignment Number	**:**	**BCA(II)/012/Assignment/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2024 (For July Session)** **30th April, 2025 (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.

Question 1:

(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:
LOAD A ; Load the content of Memory location A into the Accumulator Register.
ADD B ; Add the content of memory location B to Accumulator Register.
STOR C ; Stores the content of the Accumulator register to memory location C.
However, this machine is different from the example in Figure 4 in the following ways:

- Each memory word of this new machine is of 32 bits length.
- Each instruction is of length 32 bits with 12 bits for operation code (opcode) and 20 bits for specifying one direct operand. The size of operand is 32 bits.
- The Main Memory of the machine is of size 2^{20} words.
- The three consecutive instructions are placed starting from memory location $(11FFE)_h$; operand A is at location $(2FFFF)_h$ and contains a value $(111AB4C1)_h$, Operand B is at location $(30000)_h$ and contains a value $(AAA1A1FE)_h$ and operand C is at location $(30001)_h$ and contains a value $(00000000)_h$.
- The AC, IR, MAR and MBR registers are of size 32 bits, whereas PC register is of size 20 bits. The initial content of the PC register is $(11FFE)_h$.

(i) Draw a diagram showing the 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 the content of all the stated registers. **(2 Marks)**

(ii) Draw three more diagrams, each showing the state of the 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 the execution of the instruction. Show all the addresses and values in hexadecimal notations. **(3 Marks)**

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

i) Decimal $(345789531)_{10}$ to binary and hexadecimal.
ii) Hexadecimal $(ABC023DEF)_h$ into Octal.
iii) String "MCS-12 Price in $" into UTF 8.
iv) Octal $(12076543)_O$ into Decimal.

(c) Simplify the following function using K-map: $F(A, B, C, D) = \Sigma (0, 1, 2, 4, 8, 9, 10, 13)$
Draw the circuit for the resultant function using NAND gates. **(2 Marks)**

(d) Consider the Adder-Subtractor circuit as shown in Figure 3.15 page 76 of Block 1. What would be the values of various inputs and outputs; viz. C_{in} input to each full adder, A_0, B_0, A_1, B_1, A_2, B_2, A_3, B_3, S_0, S_1, S_2, S_3, Carry out bit, and overflow condition; if this circuit performs subtraction (A-B), when the value of A is 1010 and B is 1011. **(1 Mark)**

(e) Explain the functioning of a 2 × 4 decoder with the help of a logic diagram and an example input. **(2 Marks)**

(f) Assume that a source data value 1111 was received at a destination as 1011. Show how Hamming's Error-Correcting code bits will be appended to source data to identify 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 Marks)**

(g) Explain the functioning of the RS 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 the master-slave flip-flop with the help of a diagram. **(2 Marks)**

(i) Represent $(129.5)_{10}$ and $(-1.125)_{10}$ in IEEE 754 single-precision and double-precision formats. **(2 Marks)**

Question 2:

(a) Refer to the Figure 2(b) on page 8 in Unit 1 of Block 2. Draw the Internal organisation of a 16×2 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 need? Explain your answer.
(ii) How many address lines are needed for this RAM? Give reasons in support of your answer.
(2 Marks)

(b) A computer has 4 K Word RAM with each memory word of 8 bits. It has cache memory, having 16 blocks, having a size of 16 bits (2 memory words). Show how the main memory address $(3AC)_h$ will be mapped to the 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 the tag, index, main memory block address and offset in your answer. **(3 Marks)**

(c) What are the different kinds of interrupts? Explain the process of handling an interrupt with the help of a diagram. . **(3 Marks)**

(d) What is a DMA? What are the advantages of using DMA? Explain the functions of a DMA interface with the help of a block diagram. **(2 Marks)**

(e) Assume that a disk has 128 tracks, with each track having 64 sectors and each sector is of size 1 M Bytes. The cluster size in this system can be assumed to be 2 sectors. A file having the name *assignmentmcs012.txt* is of size 16 MB. Assume that it is a new disk, and the first 16 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 Marks)**

(f) Explain the following, giving their uses and advantages/disadvantages, if needed. (Word limit for the answer of each part is 50 words ONLY**)** **(6 Marks)**

- **(i)** Access time of disks
- **(ii)** CD-ROM
- **(iii)** Classification of Printers
- **(iv)** Scanner
- **(v)** Refresh rates of monitors
- **(vi)** Devices for data backup

Question 3:

(a) A single-core uniprocessor system has 16 General purpose registers. The machine has RAM of size 1 M memory words. The size of every general-purpose register and memory word is 32 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 64 different operation codes. The machine also has special purpose registers, which are other than general purpose registers. These special 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 purpose 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. What would be the size of each register?

(3 Marks)

(ii) Illustrate two valid instructions of the machine by drawing a diagram that shows instructions and related data in registers and memory. **(2 Marks)**

(iii) Assuming that an instruction is first fetched to the Instruction Register (IR), its 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 to fetch and execute an addition instruction that adds the contents of a memory operand with the contents of a register operand. The result is stored in 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 set of micro-operations as given in Figure 10 on page 62 of Block 3. Consider that R1 and R2 both are 8-bit registers and contain 01111110 and 11010101 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 on these registers? (For each micro-operation you may assume the initial value of R1 and R2 as given above)

(2 Marks)

- **(i)** Increment R2
- **(ii)** Subtract R2 from R1
- **(iii)** AND of R1 with R2
- **(iv)** Shift left R1

(c) Consider that an instruction pipeline has four stages namely instruction fetch (INFE), Instruction decode and Operand Fetch (IDOF), Instruction Execute (INEX) and store results (STRE). Draw an instruction pipeline diagram showing the execution of five sequential instructions using this pipeline. Explain, what problem may occur, if the 2nd instruction is a conditional jump instruction? **(3 Marks)**

(d) Explain the structure and operation of the micro-programmed control unit with the help of a diagram. **(2 Marks)**

(e) Explain the use of large register file in RISC. Also, explain the optimisation of RISC pipelining. **(3 Marks)**

Question 4:

(a) Write a program using 8086 assembly Language (with proper comments) that accepts two different digits as input from the keyboard. Each digit is converted to its binary equivalent value. These converted digits are stored in registers BL and CL. The program then stores the smaller of these two values in AL register. The program also checks if the present AL value is larger than all the values contained in a byte array of size 6, which is stored in the memory. If so, then a value 1 is moved to DL register, else a value 0 is moved to DL register. You may assume the byte array has the values 02h, 03h, 05h, 01h, 02h, 03h. Make suitable assumptions, if any. **(7 Marks)**

(b) Differentiate between the FAR and NEAR procedure calls in 8086 micro-processor. Assuming that a stack is used for implementing procedure calls, explain how call and return statements of 8086 microprocessor would use stack for NEAR and FAR procedure calls and return from a call. Also, assuming that two parameters are to be passed to a procedure using stack, explain how they will be passed to the procedure and accessed in the procedure. You need not write the assembly code but draw necessary diagrams to illustrate the concept. **(7 Marks)**

(c) Explain the following in the context of 8086 Microprocessor with the help of an example or a diagram: **(6 Marks)**

- **(i)** Explain the use of Segment Registers in 8086 microprocessor
- **(ii)** Explain the use of the flags - CF, ZF, OF, DF
- **(iii)** Explain the Instructions – XLAT, MUL, SAR, RCL

Course Code	**:**	**MCS-015**
Course Title	**:**	**Communication Skills**
Assignment Number	**:**	**BCA(II)/015/Assignment/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last date of submission	**:**	**31st October, 2024 (For July Session)** **30th April, 2025 (For January Session)**

This assignment has ten questions in this assignment. 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 passage below and answer the questions that follow:

Whatever the type of job interview — a walk-in, a telephone interview or a regular in-person job interview, preparation is the key. It is important that you keep yourself in a state of high motivation and readiness, making optimum use of your time to equip yourself to excel. Here are a few things you'd like to do for sure, by way of preparation.

You are certain to be asked specific questions about your potential employer, so make sure you've done your homework on company information like company history, recent performance, their last year's profits and latest product launches. Nothing is as disappointing as when a candidate shows enthusiasm and then doesn't even know the most basic facts and figures about the company. So, where can you find all this information? The most likely place is the Internet. A visit to the company website could help you get all the vital statistics, including products and services as well as a feel of the company culture. You must also check out the annual report and look for a press or company news page. Put their name into a search engine to see if they've had any recent interesting stories written about them. It is also advisable to tap industry sources, trade journals, newspapers and other business publications to give you good background knowledge of the industry as well as the company.

Talk to people who work in the company or in similar companies / areas to gather as much information as you can about the nature of work, responsibilities, work culture and work requirements.

For the interview, you need to know your CV inside out. Go through your CV carefully and make notes on how you will elaborate or illustrate what you have stated. You need to be ready with examples from your experience to be able to substantiate all the claims you have made. Try to relate specific areas of your CV back to the job description. It will make it clear to the interviewer why they should hire you. Also go through the copy of your application carefully before the interview. The interview panel is likely to ask specific questions about it.

Going for a job interview is no different from going for an exam. It is important that you go well prepared and confident so that you can field any question that is put to you.

Before the Interview

Apart from finding out about the company and being thorough with your CV, it would be helpful to follow these tips:

- Make a rational assessment of yourself before you go for the interview. Know your strengths and weaknesses.
- Review your skills and abilities.
- Have a mock interview with a friend based on the common interview questions you're likely to face.
- If you are asked to bring certificates, references, etc, get them ready well in advance to avoid having to chase around them on the morning of the big day.
- If you have filled up a statement of purpose as part of the application, be ready for some probing questions based on this.
- Be sure you know the time, date and location of the interview.
- Decide how you will get there and when you need to set off to arrive in good time, anticipating any delays. Visit the place once beforehand if possible.
- If you look good, you tend to feel good too. Avoid any last minute panic by preparing what you're going to wear the night before.
- Don't go into the interview with lots of baggage - psychological or physical. Take the bare minimum with you so you can concentrate on the interview, and nothing else.
- Prepare at least 5 questions that you would like to ask the panel about the company or your job. You don't have to ask them all. See for yourself what is most appropriate to ask during the interview.

(a) What should be your state of mind when getting ready for a job interview? **(2 Marks)**

(b) Why do you need to do adequate homework about the company where you have been called for an interview? **(2 Marks)**

(c) What sort of information can you get about the company from the internet? **(2 Marks)**

(d) Going for an interview is just like going for an exam? Discuss. **(2 Marks)**

(e) Regarding the tips given in the passage which is the most useful for you and why. **(2 Marks)**

Q2. Find words from the passage that mean the same as the following: **(10 Marks)**

(a) The state of being prepared for something
(b) To the maximum
(c) To stand out
(d) Possible in the future
(e) Eagerness
(f) Most important

(g) Give details
(h) Objective and reasonable
(i) Searching
(j) Being aware of

Q3. Identify the part of the sentence which is grammatically incorrect: **(5 Marks)**

(1) Even in thick fog, (2) the tower of the Taj (3) can be seen clearly (4) and so do those of the Agra fort.

(1)The ship had sank (2) in the Pacific (3) before the distress signal (4) was sent.

(1)Rajiv drove (2) as fastly as he could (3) but failed to (4) overtake the train.

(1) I don't wish (2) to buy a new camera (3) as my old one (4) works perfect.

(1) The meanings of certain (2) difficult terms and phrases (3) are given (4) in the bottom of the page.

4. Rewrite these sentences beginning with the words given below. **(5 Marks)**

(a) The crop have been destroyed due to heavy rainfall.
Heavy rainfall……..
(b) We will hold the meeting on 9th of this month.
The meeting……..
(c) The farm is being sold.
They are ……..
(d) You are requested to maintain silence.
Please ……..
(e) The college has organized an inter-school debate competition.
An inter-school……..

Q5. Fill in the blanks with a/an, the or no article *Ø*. **(10 Marks)**

The larger …….. meeting, the more difficult it becomes to reach at …….. decision. …….. ideal size of …….. meeting depends on…….. purpose of …….. meeting. If…….. meeting has been called to give…….. information to the members, the number of participants do not matter. But if …….. meeting has been called to take…….. decision on any matter, it is advisable to call just…….. few individuals for it.

All…….. meetings have something in…….. common. …….. most important feature is …….. agenda. The next is the role of …….. Chairperson. …….. efficient chairperson will adhere to …….. agenda and time and focus only on…….. purpose, and …….. reaching desired objectives of the meeting.

Q6. Write short notes on the following: **(10 Marks)**

(a) An effective meeting

(b) How to overcome panic while presenting

Q7. Write an essay in 250 to 300 words on **any one** of the following: **(20 Marks)**

- Social Media is Boon or Bane for students.
- The impact of Artificial Intelligence on Society.
- The role of ICT in the business success.

Q8. Mark the stress in the following words: **(10 Marks)**

examine	examination
academic	academician
favourite	favoritism
exhibit	exhibition
govern	government

Q9. Write a conversation between you and your father. Discuss how people have, over the years, changed the way they spend their leisure time. Take about 15 turn's atleast. **(10 Marks)**

Q10. Write a letter to a friend about your new job in a Multi National Company. Talk about the nature of work that you do and the satisfaction that you derive from it. Also talk about your team-lead, team members and project manager. Write in about 150 words. **(10 Marks)**

Course Code	**:**	**MCS-013**
Course Title	**:**	**Discrete Mathematics**
Assignment Number	**:**	**BCA (II)/013/Assignment/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Date of Submission	**:**	**31st October, 2024 (for July Session)** **30th April, 2025 (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 Power Set? Find P(A) for A = { a,b,c,d,e,f) **(2 Marks)**

(b) Make truth table for followings. **(4 Marks)**

i) $p \rightarrow (\sim r \wedge \sim q) \wedge (p \vee r)$

ii) $p \rightarrow (r \vee \sim q) \vee (\sim p \wedge \sim r)$

c) What is proposition ?

i) Write any two statements which are not proposition. **(2 Marks)**

ii) Write any two statements which are proposition.

d) Define the terms Domain, Co-domain and Range in the context of a function. Also find the domain, co-domain and range for a function A to B, where A={1,2,3,4,5} and ={1,4,9,16,25}. **(2 Marks)**

Q2. (a) Draw Venn diagram to represent followings: **(3 Marks)**

i) $A \subseteq B$

ii) $C \cup B \cup C$

iii) $(A \subset B$

(b) Write down suitable mathematical statement that can be represented by the following symbolic properties. **(4 Marks)**

i) $(\forall x)(\forall y)(\exists z)P$

ii) $(\exists y)(\forall z)Q$

iii) $(\exists y)(\forall x)(\forall z)P$

iv) $(\exists x)(\forall y)Q$

(c) Show whether $\sqrt{11}$ is rational or irrational. **(3 Marks)**

Q3. **(a)** Explain applications of inclusion-exclusion principle with example. **(2 Marks)**

(b) Draw logic circuit for the following Boolean expressions: **(4 Marks)**

i) (x'yz) + (xyz)' + (xz'y)

ii) (xyz') +xyz)+ (x'y'z)

iii) (x+y+z') (x+y+z) (x'+y'+z)

(c) What is a relation? Is every relation a function? Explain critically. Also, explain equivalence relation with the help of example. **(4 Marks)**

Q4. **(a)** How many words can be formed using letter of "DETERMINATION" using each letter at most once? **(2 Marks)**

i) If each letter must be used,

ii) If some or all the letters may be omitted.

(b) Prove that $1^3 + 2^3 + 3^3 + ... + n^3 = ¼n^2(n + 1)^2$; $\forall$ $n \in N$ **(4 Marks)**

(c) What is a tautology? If P and Q are statements, show whether the statement $(P \wedge Q) \rightarrow (P \vee Q)$ is a tautology or not. **(4 Marks)**

Q5. **(a)** A committee consisting of 5 male and2 female workers is to be constituted from 8 male and 9 female workers. In how many distinct ways can this be done ? **(2 Marks)**

(b) A and B are mutually exclusive events such that P(A) = 1/4 and P(B) = 1/2 and P (AU B) = 1/6. What is the probability of P(A ∩ B)? **(2 Marks)**

(c) Find how many 3 digit numbers are even? **(2 Marks)**

(d) Explain whether the function $f(x) = x^2 + 2$ is one-one or not. **(2 Marks)**

(e) Let f and g be the two functions such that $f(x) = x^2 + 5$ and g(x) = 2x+2 Define fof, fog, gof and gog. **(2 Marks)**

Q6. **(a)** How many ways are there to distribute 29 district items into 5 distinct boxes with: **(3 Marks)**

i) At least two empty box.

ii) No empty box.

(b) Explain principle of multiplication with an example. **(3 Marks)**

(c) Three Sets A, B and C are: A = {1, 3,5, 7,9,12,13, 15,17}, B = { 1,2, 3 ,7,8,9, 10,17 } and C {1,2,7, 8, 10, 11, 12,13,17}. Find $A \cup B \cap C$; $A \cap \sim B \cup C$; $A \cap B \cup C$ and $(A \cap \sim C)$. **(4 Marks)**

Q7. **(a)** Explain addition theorem in probability with an example. **(2 Marks)**

(b) Prove ${}^{n+1}C_r = {}^nC_r + {}^nC_rn$ **(3 Marks)**

(c) What is a function? Explain how to find inverse of a function with the help of an example. **(3 Marks)**

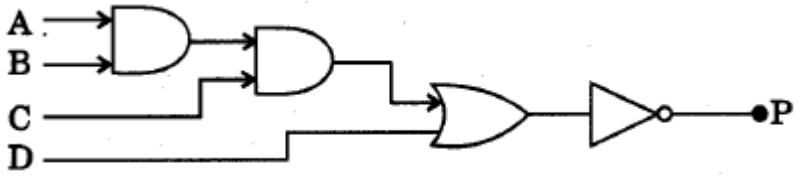
(d) Write the following statements in symbolic form: **(2 Marks)**

(i) Mahesh is hardworking student therefore he is a good performer.

(ii) Either exercise regularly or be ready for poor health.

Q8. (a) Find dual of Boolean Expression for the output (P) of the following logic circuit.

(3 Marks)



(b) Show, using the pigeonhole principle, that in any group of 30 people, 5 people can always be found who were born on the same day of the week. **(2 Marks)**

(c) "If today is a holiday then I will not go to school". Write inverse and contrapositive for this sentence. **(2 Marks)**

(d) Explain circular permutation and its application in problem solving with en example. **(3 Marks)**

Course Code	**:**	**BCSL-021**
Course Title	**:**	**C Language Programming**
Assignment Number	**:**	**BCA(II)/L-021/Assignment/2024-25**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last date of Submission	**:**	**31st October, 2024 (for July Session)** **30th April, 2025 (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. Design and implement a simple ***Book-Organizing Module of a Library Management System*** using C programming. **(40 Marks)**

Description:

Create a menu driven application that allows the user to manage the books in a library. The application should enable users to perform the following operations:

1. Add a new book record.
2. Display all book records.
3. Search a book by its ISBN.
4. Search a book by its Author.
5. Search a book by its Title.
6. Update a book record.
7. Delete a book record.
8. Save book records to a file.
9. Load book records from a file.
10. Exit.

Implement the following functions:

- **void addBook(Book books[], int *count)**
- **void displayBooks(const Book books[], int count)**
- **int searchBookByISBN(const Book books[], int count, const char *isbn)**
- **void updateBook(Book books[], int count, const char *isbn)**

- **void deleteBook(Book books[], int *count, const char *isbn)**
- **void saveToFile(const Book books[], int count, const char *filename)**
- **void loadFromFile(Book books[], int *count, const char *filename)**

Menu

- Implement a menu-driven system that allows the user to choose the operation they want to perform.

File Handling

- Use file handling to save the book records to a file and load them back when the program starts.

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/2024-25**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2024 (For July Session)** **30th April, 2025 (For January Session)**

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 counts from 0 to 2. It should have states 00, 01 and 10. The initial state of the counter may be assumed to be 00. The counter will be in following successive states: 00, 01, 10, 00, 01, 10, 00, 01, 10, 00 ... Use J-K flip flop to design the circuit. You must design the circuit using state transition diagram and Karnaugh's maps. **(10 Marks)**

Q2. Write and run following programs using 8086 assembly language. **($3 \times 10 = 30$Marks)**

(a) Write and run an Assembly language program that converts a packed 4 digit BCD number that has been stored in two consecutive byte locations in the memory, into an equivalent binary number. The output should be stored in DX register. For example, if two consecutive byte locations have BCD values $(12)_h$ and $(34)_h$ then output will be binary equivalent of $(1234)_{10}$ which is $(0000\ 0100\ 1101\ 0010)_2$. This binary value will be stored in DX register.

(b) Write and run (using appropriate calling program) a near procedure in 8086 assembly language that checks if the input parameter has a value less than 5. If the value is less than 5 then subroutines displays the line "Parameter value is less than 5" else it displays "Parameter value is >= 5".

(c) Write and run an 8086 assembly language program that finds the factorial of the value stored in BH register. You may assume that BH register will store a maximum value 8. Thus, you need not handle the overflow.