

MCA Sem-II, Minor Test - I, 2017-18

CBSE22 : Object-Oriented Programming in C++ Max Marks: 15

Time: 1 Hour

Attempt any three questions.

- * 1. ~~(a)~~ Distinguish between Procedure-Oriented and Object-Oriented paradigms with suitable examples. (2)
- * ~~(b)~~ What is a reference variable? Why do reference to an object is passed in a copy constructor instead of value? Explain. (3)
- * 2. ~~(a)~~ What is a friend function? What are the merits and demerits of a friend function? (2)
- * ~~(b)~~ Explain the inline function and the situations where inline expansion may not work and why? Discuss its advantages and disadvantages. (3)
- * 3. Define a class Student which has rollno and name as private members. Define the constructor, the Destructor and a function print() which prints the details of a student. Create an object of type Student in main() and print it. (5)
- * 4. What are the static data members and member functions? Explain with suitable example. (5)

28

MCA Sem-II, Minor Test - II, 2017-18

Time: 1 Hour

CBSE22 : Object-Oriented Programming In C++

Max Marks: 15

Attempt any three questions.

1. Define a class *City* which has name and pincode. Define another class *Address* which has house no and city of type *City*. Define the constructor, the destructor and a function *print()* which prints the address. Create an object of type *Address* in *main()* and print it. (2)
2. What is operator overloading? Write the rules for overloading operators. List the operators that cannot be overloaded using a member function. Write a program to overload prefix and postfix increment operator (*+ +*). (3)
3. What is Inheritance? Mention some advantages of Inheritance Explain different types of Inheritance with suitable examples. (5)
4. The keyword 'virtual' can be used for functions as well as classes in C++. Explain the two different uses. Give an example of each. (5)

Mubashir Wasif Mohd Ali 28

DEPARTMENT OF COMPUTER SCIENCE

Jamia Millia Islamia, New Delhi-25

M.C.A., II Semester, First Sessional Test Examination, Feb. 22, 2018

CSCC23: Data and File Structures

Time: 45 Minutes

Max. Marks: 15

Note: Attempt ALL questions.

Ques. No. 1. What is lower triangular matrix? Prove that product of two lower triangular matrices (5) is a lower triangular matrix.

Ques. No. 2. Write an algorithm to reverse a circular linked list of $n > 2$ nodes. (5)

Ques. No. 3. Suppose that there is n (n is even) elements in an array; and we want to delete the (5) elements whose index position are odd, one by one by calling $del(index)$ function of the array data structure. For example from following array we delete 20, 40, 60 etc. Write an algorithm to delete these elements and also determine the total number of required move operations.

0	1	2	3	4	5	6	7	...	$n-1$
10	20	30	40	50	60	70	80	...	10n

DEPARTMENT OF COMPUTER SCIENCE, JMI, NEW DELHI

Sessional Test-I, 2018-19

Course: MCA – II semester

Subject: Microprocessor and Computer Architecture (CSCC 24)

Time:Min.

Mohd A/1
28

MM: 15

Note: Attempt any five questions and all questions carry equal marks.

- [Q1]. What do you mean by 8085 microprocessor? Describe its bus and register architecture. ~~*~~
- [Q2]. Describe the different types of interrupts along with their functioning and priority? ~~*~~
- [Q3]. Write ALP in 8085 to divide two 8-bit numbers. ~~*~~
- [Q4]. Write ALP in 8085 to search an element in the list of elements. ~~*~~
- [Q5]. Obtain the 4096×16 memory by using the chips of size 512×8 . ~~(16) K = 2^16~~
- [Q6]. Attempt any two of the following:
- i) 1-byte, 2-byte, and 3-byte instructions ~~*~~
 - ii) Describe the status signal along with timing diagram for memory read/write operation.
 - iii) ALP to print the sum of N numbers. ~~*~~

Mohd Ali

Mubashir Warsi (17MCA028)

DEPARTMENT OF COMPUTER SCIENCE
SESSIONAL FIRST - OPERATING SYSTEM and SHELL PROGRAMMING (CBCS 21)
MCA-II SEM

DATE: 21-02-2018

TIME: 01 hours, M.M.: 15

NOTE: ATTEMPT ANY *three* QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

- (1) How does the distinction between monitor mode and user mode function as a rudimentary form of protection (security) system?
- (2) What is a system call? Illustrate any two system call.
- (3) Discuss any five general categories of information in a process control block.
- (4) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

What is the average turnaround time for these processes with the SJF scheduling algorithm (with preemption or without preemption)?

Mohd Ali

28

DEPARTMENT OF COMPUTER SCIENCE, JMI, NEW DELHI

Sessional Test-II, 2018-19

Course: MCA – II Semester

Subject: Microprocessor and Computer Architecture (CSCC 24)

Time: Min.

MM: 15

Note: Attempt any four questions and all questions carry equal marks.

[Q1]. Convert the expression $3+4*5-6/2$ into reverse polish notation and then explain its evaluation:

[Q2]. What do you mean by fast multiplication? Multiply -17 and 16 by using Booth's multiplication method.

[Q3]. A word is accessed from cache in 120 ns and from main memory in 3300ns. What will be the average access time experienced by the processor while hit ratio is given 96%?

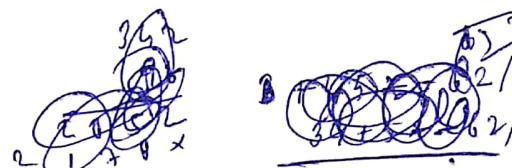
[Q4]. What do you mean by the parallel processing and how it can be achieved? Explain in brief.

[Q5]. Attempt any one of the following:

i) Classification of computer architectures

ii) Mapping of cache memory

iii) 0,1, and 2 address instructions for $(4+5)*(6+7)$



MondAli

17-MCA-03

MCA (SEM-II) EXAMINATIONS, 2018
CBSE22: OOP in C++ Lab

SET-B

Time: 2 Hours

Attempt the following questions:

1. Class Distance consists of length in feet and inches. Class Distance contains
- i. one default constructor
 - ii. one parameterized constructor
 - iii. function getdata() to take the value of feet and inches.
 - iv. function show() to display.
 - v. function to overload < operator to compare two distances
2. Write a program to create a class shape with functions to find area of and display the name of the shape and other essential component of the class. Create derived classes circle, rectangle and trapezoid each having overridden functions area and display. Write a suitable program to illustrate virtual functions.

Mohd Ali

17MCA0

DEPARTMENT OF COMPUTER SCIENCE, JMI, NEW DELHI

Practical Exams: Even Semester, 2017-18

Class: MCA II semester

Lab Code: CSCC 24 (LAB)

DOE: 05.05.2018

Time:...

MM:...

Note: Attempt any two questions by selecting one question from each section.

SECTION-A

Write and run the assembly language programs in 8085 with input/output to:

1. Transfer one list of values from one group of location to another.
2. Determine the average of N numbers.
3. Reverse the binary number; for example for the input 1010 your output must be 0101.
- ~~4. Divide the one number by another.~~
5. Largest/smallest number in a list of elements
6. Search an element in the list of elements and display the position of element in list, if present.

SECTION-B

Write and run the assembly language program in 8086 with input/output to:

- ~~1. Divide the one number by another
 2. Multiply one positive number by another negative number.~~

Mohd Ali
28

DEPARTMENT OF COMPUTER SCIENCE

SESSIONAL II- Operating System and Shell Programming, CBCS for PG-II SEM, CBCS 21

TIME: 60 minutes

M. M.: 15

NOTE: ATTEMPT ANY three QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

- (1) Discuss critical section problem and its solution.
- (2) A system contains 6 units of a resource, and 3 processes that use this resource. Can deadlocks arise in the system if the maximum resource requirement of each process is 3 units? If the system had 7 units of the resource, would the system be free of deadlocks for all time? Explain clearly.
- (3) Illustrate semaphores and their usage.
- (4) Explain four necessary conditions for deadlocks.

DEPARTMENT OF COMPUTER SCIENCE, JMI, NEW DELHI

Practical Exams: Even Semester, 2017-18

Class: MCA II semester Lab Code: CSCC 24 (LAB) DOE: 05.05.2018 Time:... MM:...

Note: Attempt any two questions by selecting one question from each section.

Mohd Ali
28

SECTION-A

Write and run the assembly language programs in 8085 with input/output to:

1. Transfer one list of values from one group of location to another.
2. Determine the average of N numbers.
3. Reverse the binary number; for example for ~~the input 1010~~ your output must be ~~0101~~.
4. Divide the one number by another.
5. Largest/smallest number in a list of elements
6. Search an element in the list of elements and display the position of element in list, if present.

SECTION-B

Write and run the assembly language program in 8086 with input/output to:

1. Divide the one number by another
2. Multiply one positive number by another negative number.

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.

1. (a) Suppose that there is n (n is even) elements in an array; and we want to delete the elements whose index position are odd, one by one by calling *del(index)* function of the array data structure. For example from following array we delete in the order 80, 60, 40, 20. Write an algorithm to delete these elements and also determine the total number of required move operations.

0	1	2	3	4	5	6	7
10	20	30	40	50	60	70	80

- (b) What is lower triangular matrix? Prove that product of two lower triangular matrices is a lower triangular matrix.
- (c) Define the linked list and write an algorithm to create a linked list of n nodes.

2. (a) What is a recursive function? Write an algorithm to implement following gcd() recursive function using stack.

$$\text{gcd}(m, n) = \begin{cases} n & \text{if } m \% n = 0 \\ \text{gcd}(n, m \% n) & \text{otherwise} \end{cases}$$

- (b) Describe the image component labeling problem and write an algorithm using queue to label different components of an image.
- (c) What is maximum heap tree? Build the following list of integers stored in array $a[1..7]$ into maximum heap tree. Show each *adjust()* operation step.

1	2	3	4	5	6	7
40	30	45	50	35	55	60

3. (a) Describe a full binary tree with an example and show that the height of a full binary tree of n nodes is $\log_2(n+1)$.
- (b) Write the formal definition of a binary tree. If n_0 is the number of leaf nodes (degree 0) and n_2 is number of nodes with degree 2 of a non-empty binary tree T , then show that $n_0 = n_2 + 1$.
- (c) What is a red-black tree? Starting with an empty red-black tree, insert the following data one by one in the given sequence. Show each insertion and rotation steps.

1, 2, 3, 4, 5

4. (a) Write bubble sort algorithm to sort list of integers in non decreasing order. In what situation it needs minimum number of comparison operations. Write the mathematical formula to get minimum number of comparisons to sort a list of n integers.

- (b) Discuss the binary search operation with the help of suitable example.

- (c) Describe the linear probing in hashing. Assume that there is a hash table of size 7 and the hash function is $H(k) = k \% 7$. Build the hash table by inserting keys: 1, 12, 24, 34, 46, 15 one by one and collision is resolve using linear probing.

5. (a) Define complete graph K_n of n vertices and show that number of edges in K_{10} is 45.

- (b) Write the steps to get the number of spanning trees of a given graph G and calculate the total number of spanning trees of complete graph K_3 .

- (c) What is a weighted graph? Discuss with suitable examples to represent a weighted graph using adjacency matrix.



Code: CBCS 21

Roll No. 17 MCA 028

- CBCS for PG Programme (SEM-II) EXAMINATIONS - 2018
Operating System and Shell Programming

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.

1. ~~(a)~~ Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other programs.
~~(b)~~ What is the purpose of interrupts? What are the differences between a trap and an interrupt? Briefly discuss.
~~(c)~~ The services and functions provided by an operating system can be divided into two main categories. Briefly describe the two categories and discuss how they differ.
2. ~~(a)~~ What is a process? Discuss the various states of a process.
~~(b)~~ Five jobs A through E arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4 and 8 minutes. Their priorities are 3, 5, 2, 1, and 4 respectively, with 5 being the highest priority. For Priority scheduling and shortest job first scheduling algorithms, determine the mean process turnaround time.
~~(c)~~ What do you mean by consumer –producer problem? Write the function for the consumer and producer when the buffer is unbounded.
3. ~~(a)~~ When do page faults occur? Describe the actions taken by the operating system when the page fault occurs.
~~(b)~~ A process references five pages, A, B, C, D, and E, in the following order:
A; B; C; D; A; B; E; A; B; C; D; E
Assume that the replacement algorithm is first-in-first-out and find the number of page transfers during this sequence of references starting with an empty main memory with three page frames.
~~(c)~~ Explain the difference between internal fragmentation and external fragmentation. Which one occurs in paging systems? Which one occurs in systems using pure segmentation?
4. ~~(a)~~ There are three levels of security in UNIX. Name each level and discuss any one among them.
~~(b)~~ What is domain of protection? Illustrate the domain structure.
~~(c)~~ Write short notes on logic bomb, stack and buffer overflow, viruses.
5. ~~(a)~~ What is redirection? How can you redirect the standard input, output and error stream to a file? Give example of each.
~~(b)~~ What is the permission of file *sample* after the following commands: chmod 555 *sample*, chmod 111 *sample*, chmod 444 *sample*.
~~(c)~~ Write a shell script to find out that a given string is palindrome or not. Give proper comments.

MCA (Semester-II) Examinations, 2017-18
THEORY OF COMPUTATION

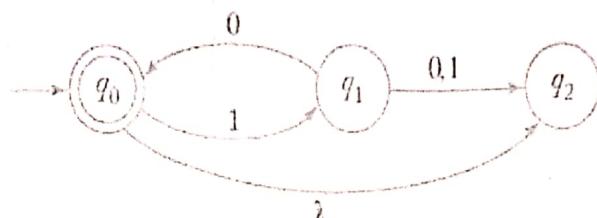
Time: 2 Hours

Max Marks: 75

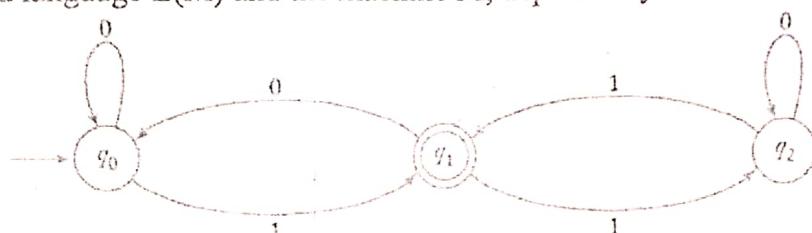
Write your Roll No. on the top immediately on receipt of the question paper.

Answer precisely any FIVE questions, including the relevant details only.

1. (a) What are the constructive proofs? Select its attributes and highlight utility, by proving a theorem or conjecture of your own choice.
- (b) Construct an equivalent DFA for the NFA given by the transition diagram as follows, and demonstrate their equivalence:



2. (c) Describe the accepted language $L(M)$ and the machine M, depicted by the transition diagram below.



2. (a) List the pitfalls of using Pumping Lemma. Determine systematically, whether the language represented by $L = \{0^n \mid n \text{ is a power of } 2\}$ is regular or not?

- (b) Given below is a right linear grammar G, convert it into an NFA.

$$S \rightarrow abA \mid bbB \mid a; A \rightarrow bB \mid aA \mid b; B \rightarrow baB \mid aaaA \mid \lambda$$

- (c) Prove that the set of all DFAs, over an alphabet Σ , is countable.

3. (a) Elaborate the concepts of linear, left linear and right linear grammar, with a suitable example each. Can every linear grammar be converted to a form in which all production look like $A \rightarrow ax$, where $a \in T$ and $x \in V \cup \{\lambda\}$? Justify.

~~2~~ Find context-free grammars for the languages, $L = \{a^n b^n \mid n \text{ is not a multiple of three}\}$.

~~2~~ Convert CFG given below to CNF, systematically and demonstrate their equivalence.

$$S \rightarrow ASA \mid aB, \quad A \rightarrow B \mid S, \quad B \rightarrow b \mid \lambda$$

4. (a) Compare PDA and NPDA, with an example each? Can we convert a NPDA into PDA? Justify.

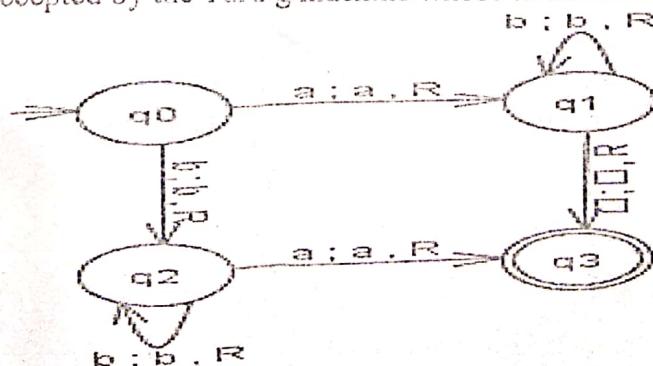
- (b) Design a NPDA that accepts the language generated by the grammar: $S \rightarrow aSbb \mid abb$.

- (c) Show that the language $L = \{a^n : n \text{ is a prime number}\}$ is not context-free.

5. (a) What is Turing machine? List the differences between it and other models of computation, with regard to their construction, power and limitations.

- (b) Design a Turing Machine that accepts the language $L = L(aaaa^*b^*)$. Show all the development stages precisely and in order.

- (c) Determine the language accepted by the Turing machine whose transition is in the figure below.



MCA (SEM-II) EXAMINATIONS – 2018
Data and File Structures (Lab)

Time: 2 hours**Max Marks: 15**

- Write your Roll no. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any ONE part from each. Marks are indicated against each question.

1. (i) Define Array class with a[], length, size data members and Array(n = 0), isEmpty(), getSize(), insert(x, index), and display() member functions. (6)
- (ii) Define LinkedList class with *create(n)* and *display()* member functions and necessary data members. (6)
- (iii) Define Matrix class with a[][], rows, cols data members and Matrix(m, n=0), read(), and print() member functions. (6)
- (iv) Define DiagonalMatrix class with a[], n data members and Matrix(n), read(), det() member functions. (6)
- (v) Define radixSort() function, using linked list, to sort the list of positive integers in non decreasing order. (6)
- (vi) Define CircularLinkedList class with first data member and CircularLinkedList(), insert(x, index), and display() member functions. (6)
- (vii) Define generic stack class using array and implement GCD recursive function using stack. (6)
- (viii) Define generic stack class using array and implement move function for tower of Hanoi problem using stack. (6)
- (ix) Define generic stack class using array and implement infixToPostfix() function to convert infix mathematical expression into equivalent postfix form using stack. (6)
- (x) Define generic CircularQueue class with isEmpty(), size(), insert(x), del() member functions and implement Image component labeling algorithm using queue data structure. (6)
- (xi) Define Tree class with a[], h data members and Tree(h), build(i), inOrder(i), preorder(i), postOrder(i), levelOrder() member functions. (6)
- (xii) Write a C function to sort list of integers in non-decreasing order using bubble sort algorithm. (6)
- (xiii) Write a C function to sort list of integers in non-decreasing order using selection sort algorithm. (6)
- (xv) Write a C function to sort list of integers in non-decreasing order using insertion sort algorithm. (6)
- (xvi) Write non recursive C function for binary search operation. (6)
- (xvii) Write recursive C function for binary search operation. (6)
- (xviii) Write a C/C++ program that read adjacency matrix of a graph and check whether it is connected or not using Warshall's algorithm. (6)
- (xix) Write a C/C++ program that read adjacency matrix of a directed graph and return indegree. (6)
- (xx) Write a C/C++ program that read adjacency matrix of a graph and return outdegree. (6)
- (i) Define AVLTree class with *root* data member and AVLTree(), insert(x), inOrder(r), preOrder(r), and getRoot() member functions. At the time of insertion operation if it go from balance to unbalance then one of four AVL rotation is to be performed to make it a balance binary search tree. (9)
- (ii) Define BinarySearchTree class with *root* data member and BinarySearchTree(), insert(x), inOrder(r), preOrder(r), and getRoot() member functions. Each node of this binary search tree stores the key and its frequency. At the time of insertion if a key already exist then its frequency will be increment by one. For example, if we insert keys 10, 5, 10, 20 one by one in an empty binary search tree, then there should be three nodes in this binary search tree, root (with key 10, frequency 2), left child (with key 5, frequency 1), and right child (with key 20, frequency 1). (9)
- (iii) Define RedBlackTree class with *root* data member and RedBlackTree(), insert(x), inOrder(r), preOrder(r), and getRoot() member functions. At the time of insertion operation if it go from balance to unbalance then a rotation operation is to be performed to make it a balance binary search tree. (9)



MCA (SEM-II) EXAMINATIONS – 2018
Microprocessors and Computer Architectures

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
 - Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.
1. (a) What do you mean by the 8085 microprocessor? Describe its various components along with its applications in real life.
 - (b) Define computer architecture and computer design. Describe some of the main features of a popular computer architecture.
 - (c) What is addressing mode? Describe various addressing modes with suitable example. Also describe the effective address in particular addressing mode.
 2. (a) Classify the instructions of 8085 microprocessor, on the basis of different criteria. Give the examples of each category of instructions.
 - (b) Write a program in 8085 assembly language for performing division operation? Trace the output of your program step by step.
 - (c) Describe the control and status signals along with their specific usage and applications in functioning?
 3. (a) What do you mean by the interface? Explain the working of interface in connection with the processor.
 - (b) Define the bus relinquishment, burst and cycle stealing data transfer modes? Where and how they are employed in the system?
 - (c) Compare the 8085 and 8086 microprocessors on the basis of different parameters? Write a program in 8086 assembly language to multiply -75H and 56H.
 4. (a) What do you mean by the interrupts and subroutines? Describe and compare their ways of working.
 - (b) What is computer arithmetic? Describe the Booth's multiplication and division methods by taking some examples.
 - (c) Attempt any one of the following:
 - i) Convert the expression $2^4 + 3 * 8 / 2 - 5$ into reverse polish notation and evaluate it.
 - ii) Zero, one, two, and three address instructions for $x = (a+b)*(c+d)$
 5. (a) What do you mean by cash memory? Explain its read and write operations.
 - (b) A computer with cash access time of 100ns, a main memory access time of 1000ns and hit ratio of 0.9. Find out the average access time experienced by the CPU.
 - (c) Write short notes on any two of the following:
 - i) Memory hierarchy
 - ii) Pipeline, vector processing and array processing
 - iii) Classification of architectures and performance measuring

MCA (Sem-II) Examinations 2017-18**Time: 2 Hours****Object-Oriented Programming in C++****Max Marks: 75**

- Write your Roll no. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts from each question. All questions carry equal marks.

- 1. (a)** How Object-Oriented Paradigm is different from Procedure-Oriented Paradigm? What are the Pros and Cons of Object-Oriented Methodology? Explain
- 2.** (a) What is a reference variable? Why the reference to an object is passed as argument instead of value in a copy constructor? Explain.
- (b) What are input and output streams? Explain various stream classes available in C++ and their relationships with suitable examples.
- (c) How a friend function is different from a member function? What are the merits and demerits of a Friend function? What is the role of a friend function with respect to more than one independent classes? Explain with a suitable example
- (d) Explain the differences between passing arguments "by reference" and "by addresses" to functions. Explain the use of *this* pointer through an example.
- 3.** (a) Define a class Employee which has *empid* and *empname* as members. Define the constructor, the destructor and a function *print()* which prints the details of 10 employees. Create objects of type Employee in *main()* and print them.
- (b) What is operator overloading? Write the rules used for overloading operators. Explain, why a friend function cannot be used to overload assignment operator (=)? Write a program to compare two objects of class String by overloading <, > and == operators.
- (c) What do you mean by Overloading of a Function? On what basis, the compiler distinguishes between a set of overloaded functions having the same name. Write a program to compute the area of a triangle and circle by overloading the area function.
- (d) Explain the usage of static data members and static member functions using a suitable C++ code. Why static members of a class cannot be initialized by constructor of the class?
- 4.** (a) What is Inheritance? Explain different types of Inheritance with suitable examples. What problem may be encountered in Multiple Inheritance and how is it solved? Explain.
- (b) What is Virtual Function? How run-time polymorphism can be accomplished using virtual functions? Explain with a suitable C++ code.
- (c) What do you mean by Abstract class and Pure Virtual Function? What is the purpose of an Abstract class? Explain the difference between function overloading and function over-riding with the help of a suitable example
- 5. (a)** Explain the usage of *fstream*, *ofstream* and *ifstream* classes used for the file stream operations with examples. Write a program in C++ to merge the content of two given files namely *file1* and *file2*.
- (b) What do you mean by Exceptions? What mechanism is used for handling exceptions in C++? Write a program to explain the usage of try and catch blocks. What are run-time exceptions?
- (c) What do you mean by Generic Function and Generic Class? What are its advantages?
- (d) Create a generic class with data members of any numeric types and include generic member functions to find the sum and product of two matrices of any numeric data types.

Set A

Mohd Ali

28

Roll No. ... 17 MCA 02

DEPARTMENT OF COMPUTER SCIENCE
CBCS 21 Lab – Shell Programming, MCA-II SEM

NOTE: ATTEMPT ANY three QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

1) Write a script for the following.

- a. Displays the messages First division if the marks entered are ≥ 60 .
- b. Displays the messages Second division if the marks entered are ≥ 45 and < 60 .
- c. Displays the messages Third division if the marks entered are ≥ 36 and < 45 .
- d. Displays the messages fail for the other conditions.

2) Consider a file, stock.list, which contains the product code, product name, price, quantity, and category of product as follows.

Product code	Product name	Price	Quantity	Category of product
101	Jeans	1000	10	garments
102	Camera	5000	3	electronics
103	Trousers	1200	5	garments
104	Laptop	4000	15	electronics
105	Cellphone	8000	8	electronics

Considering the file stock.list as the input file, write the commands for performing the following tasks.

- (a) To print only the code of the electronics products.
- (b) To print the information of the products whose price is in the range 5000–10,000.
- (c) To print all the products except jeans.
- (d) To print the third record in the file.
- (e) To print the product whose code is 102.

3) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

- 4) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
- 5) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.

MCA (SEM-II) EXAMINATIONS – 2018

Systems Analysis and Design

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt all questions selecting two parts from each. All questions carry equal marks.

1. (a) What is an information system? Precisely explain its significance and relevance in present context. List some of its advantages and drawbacks.
 (b) Categorically distinguish between problem domain and solution domain. Explain their significance with specific example.
 (c) Discuss the management triangle. Write strategic, tactical and operational level decisions (one each) in the domain of your choice. Specify the key information required to take each of these decisions.
2. (a) What do you understand by a system request? Explain with example. Enumerate criteria used to evaluate the system request.
 (b) What is decomposition? Why do you need to decompose a system? Decompose a system you are familiar with and also state the purpose of each sub-system.
 (c) How do you plan a strategy for fact finding? What are questionnaires? Write the advantages and disadvantages of using questionnaire. Briefly discuss various types of questionnaires.
3. (a) Write down a short note on the importance of Analysis Phase in the SDLC. Enumerate the important considerations that need to be taken into account while finalizing the system requirements.
 (b) Discuss the role of requirements modeling in the success of system project. A university has the following rules for student to qualify for a degree with physics as the main subject and mathematics as the subsidiary.
Marks should be 50% or more in physics and 40% or more in mathematics. If marks in physics are less than 50% then marks in mathematics must be 50% or more. However, physics marks must be at least 40%. If marks in mathematics are less than 40% but those in physics are 60% or more then only examination in mathematics has to be repeated. In all other cases the student fails. Express this requirements (statements) using Structured English and Decision Table.
 (c) Identify the specific differences between DFD and Flow Chart. Write down the guidelines for drawing a DFD. Draw physical and logical DFDs for encashing a cheque.
4. (a) Write down the note on the importance of system design phase in the software life cycle. Draw a model to show the inputs and outputs of design phase. Discuss the characteristics of good software design.
 (b) List the benefits of user centric design (UCD). Describe how it evolves from conception to completion.
 (c) What do you mean by a component? How do you visualize and realize a component in software development process? Precisely describe the interface sections of a component.
5. (a) What is an Object? Enumerate the benefits of building code into individual software objects. Explain how Object Oriented Technology reduces the software complexity and simplifies software development process.
 (b) Explain how the OMT models (object, dynamic, functional) are interrelated? Prepare the object diagram for the following situations.
 - A directory may contain many other directories and may optionally be contained in another directory. Each directory has exactly one user who is an owner and many users who are authorized to use the directory.*
 - Each person working for a company receives a salary and job title. The boss evaluates the performance of each employee.*
 (c) Precisely discuss how UML was evolved? Write down some of the basic reasons of its popularity. Draw a use case diagram for a payroll system and ATM system.