MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-IV

ASSIGNMENTS

(July - 2016 & January - 2017)

MCS-041, MCS-042, MCS-043, MCSP-044, MCSL-045

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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CONTENTS

Important Notes

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

Course Code	**:**	**MCS-041**
Course Title	**:**	**Operating Systems**
Assignment Number	**:**	**MCA(4)/041/Assignment/16-17**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th October, 2016 (For July 2016 Session)** **15th April, 2017 (For January 2017 Session)**

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

1. Consider the following set of processes with arrival times and CPU execution times given in milliseconds. A process with a larger priority number has a higher priority. If any assumptions made by you, state them.

Process	**Arrival Time**	**Execution Time**	**Priority**
P1	0	04	5
P2	3	12	4
P3	5	09	3
P4	5	02	2
P5	7	06	1

(i) Draw the Gantt charts illustrating the execution of these processes using the FCFS, SJF, Round Robin (with quantum = 1) and Priority Based Scheduling algorithms. *(20 Marks)*

(ii) Also calculate the average turn around time, average waiting time, processor utilization and throughput for each of the algorithms mentioned in (i).

2. Consider the following page-reference string: *(20 Marks)*
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6

How many page faults would occur for following replacement algorithms for a memory with 4 frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

(i) LRU replacement.
(ii) FIFO replacement.
(iii) Optimal replacement.

3.	Write a monitor solution to the dinning-philosopher problem.	*(10 Marks)*
4.	Study and implement the Lamport's Bakery Algorithm for Interprocess synchronization using C/C++ programming language.	*(10 Marks)*
5.	Discuss in detail the features, Process management, Memory management, I/O and File management and Security and Protection in Windows 10 Operating System.	*(20 Marks)*

Course Code	**:**	**MCS-042**
Course Title	**:**	**Data Communication and Computer Network**
Assignment Number	**:**	**MCA(4)/042/Assignment/16-17**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th October, 2016 (For July 2016 Session)** **15th April, 2017 (For January 2017 Session)**

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

1. Write Dijkstra's algorithm and explain how does it work. Use the algorithm to find the length of a shortest path between the vertices A and F in the weighted graph shown in Figure 1. Show all the intermediate steps. *(10 Marks)*

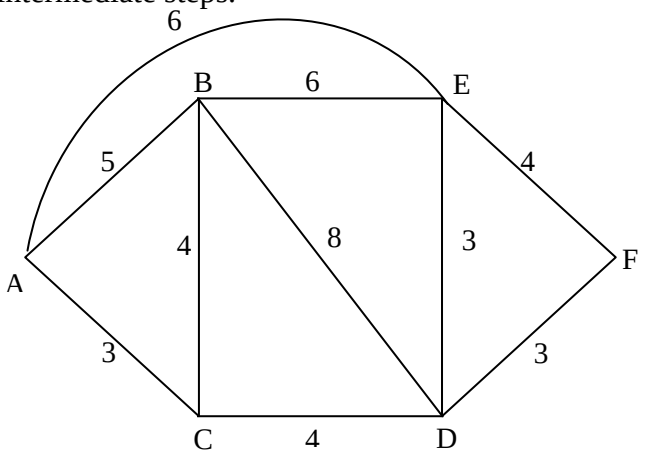


Figure 1: A weighted graph

2. Explain how a network congestion is controlled using *slow start* algorithm in TCP with help of an illustration. Is congestion control and flow control are equivalent? *(10 Marks)*

3. Describe how MACAW is an improvement over MACA ? *(5 Marks)*

4. Explain and illustrate sliding window Protocol with window size of 5. How does the scheme improve the efficiency of transmission ? *(7 Marks)*

5. Explain the function and working model of Kerberos with the help of a diagram. *(8 Marks)*

6. Explain the process of generating a digital signature. What are its benefits ? *(5 Marks)*

7. What is called Constellation diagram ? Illustrate Constellation diagram of QAM – 16 and QAM – 64. *(5 Marks)*

8. Differentiate between Leaky bucket and Token bucket traffic shaper. Why is traffic shaping needed ? *(5 Marks)*

9. Assume we need to download a text document at a rate of 100 pages per minute. What is required bit rate of the channel.
Assume Page size = 24 lines
Each line = 81 characters *(7 Marks)*

10. Find CRC for the data polynomial $x^9 + x^7 + x^3 + x^2 + 1$ with generator polynomial $x^3 + x + 1$. *(6 Marks)*

11. Suppose you are developing a standard for a new type of a network. You need to decide whether your network will use Virtual Circuits (VCs) or datagram routing. What are the Pros & Cons for using VCs ? *(6 Marks)*

12. Why is that packet switching is said to employ statistical multiplexing ? Contrast statistical multiplexing with the multiplexing that take place in TDM. *(6 Marks)*

Course Code	**:**	**MCS-043**
Course Title	**:**	**Advanced Database Management Systems**
Assignment Number	**:**	**MCA(4)/043/Assignment/16-17**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th October, 2016 (For July 2016 Session)** **15th April, 2017 (For January 2017 Session)**

This assignment has eight questions, which carries 80 marks. Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations. Place go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

1. (a) Construct an E-R diagram for a coaching institute which prepares students for entrance to engineering programs. The institute conducts theory classes from Monday to Saturday from 9 am to 8 pm in Physics, Chemistry, Maths and English. The institute maintains records about faculty (visiting, full time) and supporting administrative staff, students, assignments, test result, class timings and payments made to staff. Students are admitted to the institute after they have successfully passed the test. The institute issues transcripts to students showing student's performance in the class tests. The transcript contains student' name, subject (physics, chemistry, math and English), assignment score and test score. Clearly indicate the entities, attributes, relationship between entities, keys and cardinalities. *(10 Marks)*

(b) Create appropriate tables and relationship among them for the E-R design *(6 Marks)*

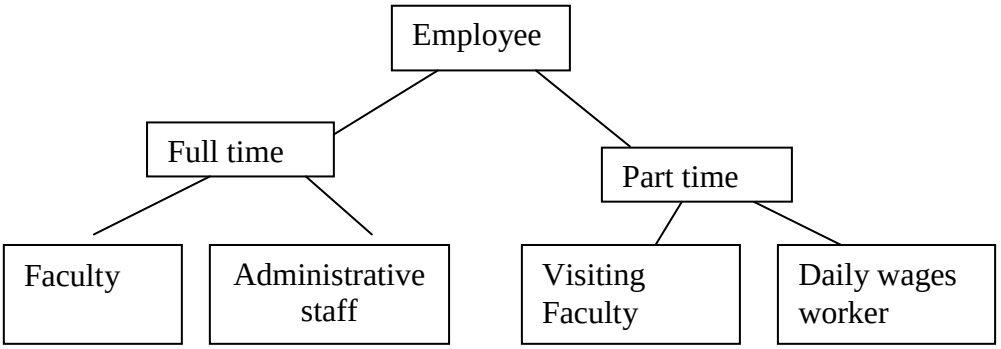
(c) Define the concepts of specialization and generalization. Give one example(generalization - specialization hierarchy) of where these concepts are useful in the above E- R diagram *(6 Marks)*

(d) Differentiate between a weak entity and a strong entity set. Identify these entity sets in the above diagram. How will you convert a weak entity set to a strong entity set? *(6 Marks)*

(e) Using the coaching institute example above, write relational – algebra expressions to find out the following queries: *(6 Marks)*

- Find out students who have secured more than 70 percent in physics and chemistry.
- Find out part time faculties who teaches two subjects

2. Create an object oriented database for the following UML class diagram. Make assumption about your attributes and facts. *(6 Marks)*



3. Explain MVD (Multi Valued Dependencies) and join dependency with the help of an example of your choice. *(6 Marks)*

4. Define a simple hash-join and explain the process and cost calculations of hash-join with the help of an example. *(6 Marks)*

5. The following are the relational schemes of Employee, Project and Assigned-to *(8 Marks)*

Employee (Emp#, Emp_name, Profession),
Project (Proj#, Proj_name, Chief_Architect),
Assigned-to (Proj#, Emp#).

- Create appropriate samples of each relation according to the question.
- Write the following queries in SQL.

  (i) Get Emp# of employees working on Project numbered MCS-043.

  (ii) Get details of employees working on database projects.

  (iii)Finally create an optimal query tree for each query.

6. Given the following semi-structure data in XML, create the DTD (Document Type Declaration) for it *(5 Marks)*

```
<document>
        <student>
            <NAME>
            <Address>
            </student>
        <student>
            <NAME>
            <Address>
            </student>
</document>
```

What are the different options available for storing XML data?

7. What is data mining? How is it different from OLTP? What is classification in context of data mining? *(5 Marks)*

8. How will you enforce referential integrity constraints in Oracle? Explain with the help of one example. *(5 Marks)*

9. How does PostgeSQL perform storage and indexing of tables? Briefly discuss the type of indexes involved in PostgeSQL *(5 Marks)*

Course Code	**:**	**MCSP-044**
Course Title	**:**	**Mini Project**
Assignment Number	**:**	**MCA(4)/P-044/Assignment/16-17**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th October, 2016 (For July 2016 Session)** **15th April, 2017 (For January 2017 Session)**

There are five questions in this assignment carrying 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 Program Guide for the format of presentation. Assumptions made if any, should be stated.

Background and Project Specifications:

A medical store needs to maintain its inventory of medicines and other products using a computerized system. It is planning to create a network of computers which should be placed at various sales and cash counters. It also proposes to have a centralized workstation for the database and system administrators. Customer orders are accepted at the sales counters which in turn produces a medicine collection challan. The challan includes the order number, name of medicine, batch number, date of expiry, shelf number where it is kept and quantity ordered. One order may contain more than one medicine. As per challan, medicines are put in a basket by a person, who passes it to billing assistant. Billing assistant checks the medicine is as per the challan, any shortcoming is either corrected or reported to customer. On receiving conformation from the customer the bill is generated. The cash counter collects the money as per the bill and dispenses the medicine to the customer.

This system also produces reports relating to daily sales, list of medicines that needs to be procured for the medical store, the list of medicines that are nearing expiry date etc. You may study the requirements from a medicine shop for more details. Perform the following tasks for the system given above:

1. (a) Which System Development Life Cycle (SDLC) will you propose for the specification given above? *(5 Marks)*

(b) Justify you selection by evaluating suitability of at least two SDLCs. *(5 Marks)*

2. (a) What would be major costs of the system? *(2 Marks)*

(b) What may be the financial benefits of installing such a system? *(2 Marks)*

(c) Perform a cost-benefit analysis for the proposed software and report its findings. *(2 Marks)*

(d) List the major tasks and milestones of the Project and make a project schedule. You must make both GANTT and PERT charts. Explain the two charts drawn by you. *(4 Marks)*

3. (a) Study the system and create a software requirement specification. You must identify either processes or objects while analyzing. During the analysis give consideration to possible input and output of the processes. *(15 Marks)*

(b) After identifying the requirements, create Analysis Models. You may either use the classical approach and draw Entity relationship diagram and data flow diagrams (DFD's) up to level 2-3; or you may take object oriented analysis approach and create class diagram, use case diagram, use cases etc. *(10 Marks)*

4. (a) Design the system architecture and the database as per the needs of the system. You must perform normalization on relations up to 3rd normal form. The table design must include Primary and Foreign keys and constrains. *(15 Marks)*

(b) Create the system flow chart or detailed process design and state transition diagrams. Also design the user input screens and output report formats. *(10 Marks)*

5. Design various unit test cases for different testing techniques/strategies. *(10 Marks)*

Course Code	**:**	**MCSL-045**
Course Title	**:**	**UNIX and DBMS Lab**
Assignment Number	**:**	**MCA(4)/L-045/Assignment/16-17**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2016 (For July 2016 Session)** **30th April, 2017 (For January 2017 Session)**

The assignment has two parts A and B. Answer all the questions. Each part is for 20 marks. UNIX and DBMS lab record carries 40 Marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the MCA Programme Guide for the format of presentation. If any assumptions made, please state them.

PART-I: MCS-041

1. Write the UNIX commands for the following: *(5 Marks)*

   (a) Use the *more* command, and a *pipe* to send the contents of your *.profile* and *.shrc* files to the screen.

   (b) Use head and tail in a pipeline to display lines 10 through 15 of a *file*?

   (c) To search the */etc/passwd* file for the string given by the user and display whether it is found.

   (d) To display the lines in /*etc/passwd* that begins with the character "a".

   (e) List all the files in the */tmp* directory owned by the user root.

   (f) To see a complete listing of all the processes currently scheduled.

   (g) Use the *ps* command, and the *grep* command, in a pipeline to find all the processes owned by you.

   (h) To force termination of a job whose *process ID* is given.

   (i) Sort the */etc/passwd* file, place the results in a file called *paswd*, and trap any errors in a file called *err* with the command.

   (j) To sort a text file containing the names of 10 students in *alphabetical order* and place the results in a file called *sortedfile.*

2. (a) Write a shell program to count the number of special symbols, end of line characters and blank-spaces present in a text file. Redirect the output to a file called as *output*. *(5 Marks)*

   (b) Write a shell script to take username as an argument and check whether s/he has logged in or not for every 30 seconcs for 5 minutes. *(5 Marks)*

(c) Write a shell script to display the number of files and their details in the current directory, whose filenames are starting with the character "b". *(5 Marks)*

PART-II: MCS-043

1. (a) Create an appropriate database using Oracle for a "MCA Evaluation System" for all the 6 semesters. It should cater to the student-wise marks entry for all the assignments and term end exam of all the courses, marks processing, calculation of total marks, generation of grade card etc.. Perform Normalization, to the required levels. *(10 Marks)*

Note: Assumptions can be made wherever necessary. Follow the evaluation scheme given in your MCA Programme Guide.

(b) Perform following queries using SQL: *(5 Marks)*

(i) To find the total no. of marks for all the assignments submitted by a student in 5 semesters, if the enrolment no. is given.

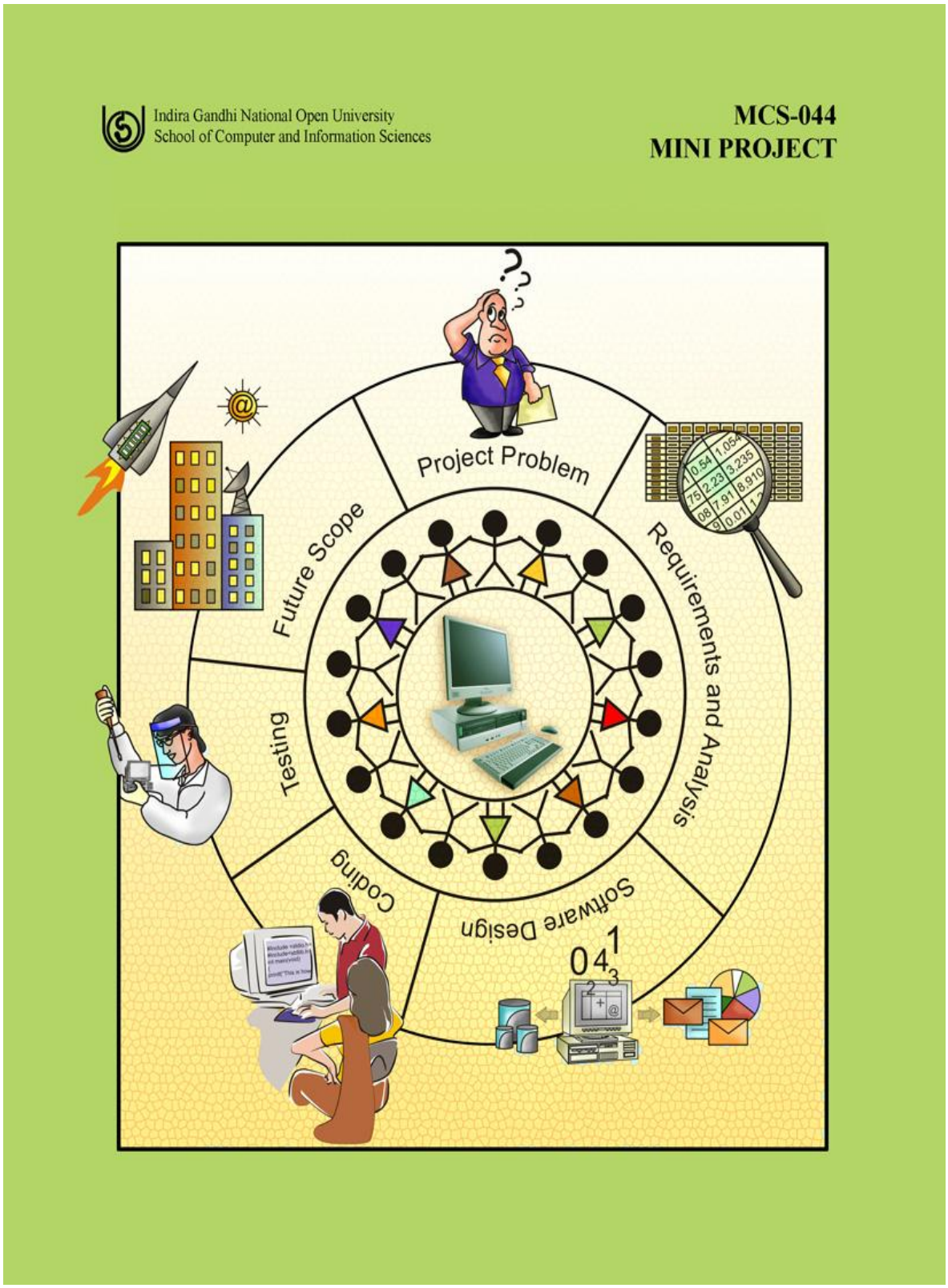
(ii) To find the total no. of marks for all the Term End Exams of a student in 5 semesters, if the enrolment no. is given.

(iii) To display the list of student who have passed in all the first semester assignments.

(iv) To display the list of all the students who scored more than 70% in MCS-011.

(v) To display the list of all the students who were failed in MCS-011 course.

(c) Write appropriate triggers, exceptions and functions for the above said system database schema and describe them briefly. *(5 Marks)*



Problem Definitions for July 2016 & January 2017

Important Notes

1. **Viva-voce of this project is compulsory.**
2. **Please follow MCS-044 guidelines for process of solving project problem and for the presentation format for submission of mini project report.**
3. **Please do not attempt the problems given in the course material of MCS-044, Block -1 or any other old problems. You must attempt one of the problems given in this section, if you submit mini project during July 2016 or Jan 2017 session.**

INTRODUCTION

The mini project is designed to help you develop practical ability and knowledge about practical tools/techniques in order to solve real life problems related to the industry, academic institutions and computer science research. The course Mini Project is one that involves practical work for understanding and solving problems in the field of computing. In this booklet the list of the problem definitions for the July, 2016 and Jan, 2017 sessions are given. Every year, the list of problem definitions will change. **Please do not attempt the problems given in the booklet (MCS-044, Block-1) received by you along with your course material.**

PROBLEM DEFINITIONS

We have divided different projects into four broad areas / categories of computer science as given below, so that you can select any one of these categories for your Mini project.

- Application development
- Networking project
- System software
- Website development.

An initial list of project definition will be given below in the following sections. However, student can elaborate the project definitions after discussing it with the project counsellor.

Students should **select one project from the given categories only** as per their interest, experience and knowledge in that area. Students should evaluate themselves and then should choose the project. Students may propose modifications/suggestions in the given project specification and finalize it in consultation with the MCS-044 counsellor.

APPLICATION DEVELOPMENT PROJECTS

Here we focus on investigating new ideas in application development through different projects. A set of possible project name and their details will be presented, however, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) Project Name: Music and Video Store Management

Description

A hypothetical Music and Video store uses the database system to manage the store. The company buys the duplication rights of selected movie videos and songs. It sells them in an itemized manner and as per the sale pays royalty to song/movie Company. An order of a customer is received at the order desk, which is then passed to media creation and processing center. Media creation and processing center processes the order and produces the DVD or CD of movie/songs as desired by customers. Customer is then charged accordingly. The company is able to make a profit due to the fact that they produce high quality videos and music; and no copyright violation is done. It also allows customer to buy their own mix of songs. However, the movies are sold as one complete package. The company is also able to cut the price of the DVDs and CDs as it has its own high quality media creation and processing center. The company records all the information about the movie and music including the company which owns the copyright. It records all the sales that are made to the customers and accordingly calculates the royalty for the owner company. It also keeps track of the stock availability of various items like blank DVDs, CDs, printing paper etc. which are required for the media creation and processing center.

Use suitable data structure/database to create this system. Your system should be such that it should try to answer the following queries or create the following lists:

- The list/brochure of video and songs available for sale. You should be able to produce this list in different sorted orders as per the choice of the customer, for example, in the order of Movie names or in the order of singer name or in the order of actor name etc.
- The status of inventory of the items that are stocked at the media creation and processing center
- The royalty that needs to be paid (monthly basis).
- The total sales for the month.

You may add more queries and more functionality into the system.

2) Project Name: Computer Maintenance Management

Description

A Company has about 4000 computers, 100 printers and 4000 UPSs. Each machine has as ID and is allotted to one employee. The company keeps track of

the status of each of these items. Any problem with any of the machine is reported to a central control station, where complaint is logged. The complaint is handed over to a computer engineer, who tries to get it rectified. In case, engineer is not able to rectify the complaint in 2 working hours, a designated maintenance company is asked to rectify complaint of the computer. The maintenance company is paid as per a notified price for the parts as well as services. In case, the maintenance company is not able to repair the machine in one working day, it provides a temporary replacement machine and takes the faulty machine to its workshop for repair. In case, the machine is declared unrepairable, the company buys a new machine and sells this old machine. You need to develop a computer based MIS about the maintenance of machines. This MIS system should be able to inform about the make, year of purchase, employee allotted to and repair history of the machine.

Use suitable data structure/database to create this system. Your system should be such that it should try to answer the following queries/reports:

- Display the maintenance status of all the machines, listing all the previous repairs it has undergone.
- List the machines that have been purchased in the last year.
- Predict how many new computers, printers and UPSs may be needed this year based on previous year repair history.
- List of allotment of each computer, printer and UPSs.

You may add more queries and more functionality into the system.

NETWORKING PROJECTS

We will focus on investigating new ideas in networking research through different networking projects. A set of possible project topics which will be presented, however, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) Project Name: Simulation of Token Ring Network

Description

Create a token ring network with 8 nodes connected in a star topology. The link or cable used in this topology should operate at a data rate of 4 Mbps. Simulate the function of token ring network. Also, show utilization and delay of the network due to traffic and token holding time by the nodes.

2) Project Name: Implementation of Virtual Laboratory for Distance Learning

Description

Design and develop a virtual laboratory for distance learning. In this laboratory different computers (workstation) are managed by server computer. Server has

complete control of every computer of this lab (You need not design this software). Assume that a total of 10 computers are connected in the laboratory using Star topology. Activity of every computer can be seen by the Server computer. Teacher at server computer can discuss with each student at workstation using web camera and headphone. You need to manage web camera and voice services. Use Linux or Windows server to manage these workstations, groups, ownership, permissions, etc.

SYSTEM SOFTWARE DEVELOPMENT PROJECTS

Here we will focus on investigating new ideas in application development through different projects. A set of possible projects and their details will be presented however, students, are encouraged to be creative and develop their own ideas in the given project descriptions.

1) Project Name: Create a library utilities

Description

Create a library utility preferably using UNIX, that accepts a text file, splits it into two parts; applies different encryption algorithm (you may select any encryption algorithm) on the two parts of the file and merges them again into a single file. Also write the utility that decrypts the encrypted file back to original file. You must use an object oriented programming language for implementing this project.

2) Project Name: Implementation of a monitor for mutual exclusion

Description

Assume that a mutually exclusive data resource is guarded by a modified *monitor*. This monitor maintains two different queues for waiting processes. The first queue is a high priority queue. High priority is given to a process which has NOT used the data resource earlier at all. Other processes are allotted to second queue. The monitor allots the data resource as per the following sequence Queue1, Queue1, Queue2, Queue1, Queue1, Queue2, … If any of the Queue is empty then it losses its chance from that sequence. You may make suitable assumptions for the implementation. You may use any programming language for this implementation.

WEB DEVELOPMENT PROJECTS

Here, we will focus on investigating new ideas in application development through different projects. A set of possible project name and their details will be presented, however, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) Project Name: Online Grocery Ordering

Description

An e-commerce store sells Grocery products. It takes online orders of registered customers. It takes orders of only those products which are available in the store. The basic product information that is displayed online includes Product ID, Product Name, Date of Manufacture, Best Before date, Price, basic details of the product and discount on that product, if any. An order includes order number, customer ID of the customer who placed the order, address where order is to be delivered, date of order, list of products and their quantities and the amount to be paid by the customer. The store, in the beginning, is following the model of Cash on Delivery. Analyse the requirements in details and design & develop the online e-commerce system for the store. You may visit few e-commerce web portals for analysis of the problem domain.

2) **Project Name: Online Peer review system**

Description

A Peer reviewed online Journal keeps track of all the articles received by it using an online system. It has a list of reviewers in which reviewers are added or deleted. A reviewer can be assigned articles of one area only. An article is identified by an article id, title, authors (can be more than one), expertise area and status. On submission of an article, it is sent to two reviewers who are given a time of two weeks to review the article and send back the comments. You need not make this process in your system, rather just keep track to whom the article was sent. When the comments from reviewer's are received they are entered in a database. In addition to comments, the reviewer must give a recommendation which can be – "Accepted", "Send back for modifications as per comments", "Rejected". All such information is suitably updated in the online database. An author is asked to check the status of his/her article from time to time. The system tracks the status of every article. Analyse the requirements in details and design & develop the online peer-review system for the online Journal.

GUIDELINES

The MCS-044 block covers the majority of the guidelines regarding the formulation of the project proposal, formulation of the project report and the format to the followed for the project report. However the following are the detailed guidelines with respect to the counseling sessions and evaluation scheme.

Practical Counseling sessions

Students can discuss their topic with the counsellors at study centres and the counsellors will give suggestions on project specification at the study centre during the practical sessions. There are total 10 practical sessions, as given below:

Name of the Topic	No. of Practical Sessions (3 hrs each)
Project specification	1
Coding / Implementation	5
Testing	2
Documentation	2

Role of the Counsellor

The MCS-044 Mini-project counsellor is the person who motivates and helps students during the development of the project. The counsellor should take responsibility for guiding and approving different project processes, including Analysis, Design, Coding, Testing, and also the editing of project reports. Moreover, the main responsibilities of a counsellor are:

- Dedicating adequate time to the student for providing effective supervision and encouragement,
- Making sure that the student chooses a manageable project topic,
- Providing critical comments on the student's work and progress,
- Ensuring the student has access to necessary data,
- Encouraging the student to proceed in the intended direction and to agreed time limits, and
- Making sure that the project is the student's own work.

PROJECT SUBMISSION

Project Proposal

Project proposal should be presented to, reviewed by and agreed upon in consultation with the project counsellor to provide constructive feedback on the proposal and planned programme of the project work. **No need of any formal approval to be taken on any proforma**.

Project Report

The project report will contribute to the assessment and your marks. The format of this report will follow the format, guidelines and suggestions given in the block, but details should also be discussed with your counsellor. The final reports of students doing **the project in a group should not be identical. Each student should emphasise on his/her role and responsibilities in the project work.**

Submission of the Project Report

One copy of the original project report is to be submitted to the Study Centre concerned. A photocopy of the same project report must be retained by the student and should carry with him/her at the time of the viva voce.

EVALUATION SCHEME

MCS-044 course has three main evaluation components consisting of assignment (25 marks), project report (50 marks) and viva-voce (25marks). **A student is required to score 40% marks in each of these components separately for successful completion of the course.**

The project will be assessed by a written report and a combined presentation and viva voce (viva voce). To help the students we have given some guidelines about evaluation and assessment in the next section. If, the examiner finds that the project is lacking in any key areas then, the student will be asked to re-submit the project by selecting a new topic in the next session.

Resubmission of the project by the failed students

If the student fails in project report evaluation or viva-voce or in both, the students need to redo the entire process by selecting a new problem from the list of problems which will be updated every year.

Assignment/Continuous Evaluation

25% of total marks are allotted to assignment/continuous evaluation. The assignment questions are given in the MCA 4th semester assignment booklet.

If the student failed only in assignment component and successfully passed in project report evaluation and viva-voce, s/he needs to submit the fresh assignment of the current year, as is done in the normal courses.

Final Evaluation

The Term End Practical Examination of Mini Project will be conducted at the study centre concerned. 75% of total marks are evaluated in the final evaluation. Out of these 75 marks, 50 marks are allotted for the project report evaluation and 25 marks are allotted for viva voce.