G H RAISONI UNIVERSITY, AMRAVATI
SCHOOL OF ENGINEERING & TECHNOLOGY
END SEMESTER EXAMINATION (WINTER 2023)
BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING
(FIFTH SEMESTER)

Course: DATABASE MANAGEMENT SYSTEM **Course Code: UCST301**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Analyze an information storage problem and derived an information model expression in the form of Entity relation diagram and design appropriate data model for it.
CO2.	Demonstrate SQL queries to perform CRUD (Create, Retrieve, Update, Delete) operations on database and perform inferential analysis of data model
CO3	Identify features of database management systems and Relational database and Understand functional dependencies and various normalization forms
CO4.	Perform basic transaction processing and management and ensure database security, integrity and concurrency control
CO5.	Analyze the management of structured and unstructured data management with recent tools and technologies

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) 1M CO1

a) What are five main functions of a database administrator? 1M CO1

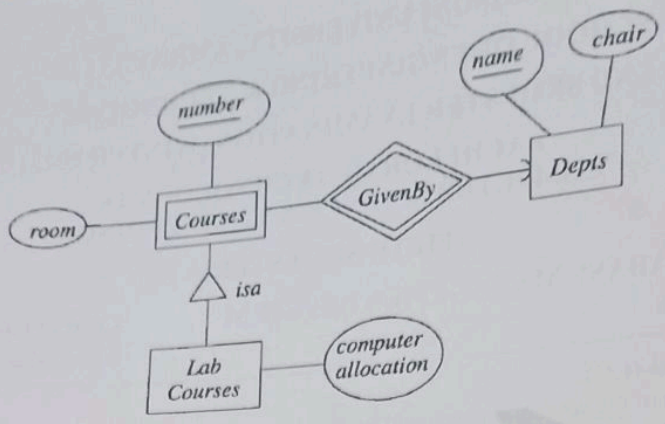
b) Describe at least 3 tables that might be used to store information in a social-networking system such as Facebook. 1M CO1

Q.1) Solve Any Two

a) List five responsibilities of a database-management system. For each responsibility, explain the problems that would arise if the responsibility were not discharged. 4M CO1

b) Give an E /R diagram for a database recording information about teams, players, and their fans, including: 4M CO1
1. For each team, its name, its players, its team captain (one of its players), and the colors of its uniform.
2. For each player, his/her name.
3. For each fan, his/her name, favorite teams, favorite players, and favorite color.
Remember that a set of colors is not a suitable attribute type for teams. How can you get around this restriction?

c) Consider the following E /R diagram: 4M CO1



Convert this diagram to a relational database schema.

Q.2)

a) Describe the differences in meaning between the terms relation and relation schema. 1M CO2

b) Define Foreign Key. 1M CO2

Q.2) Solve Any Two

a) Consider the following relational database: 4M CO2

Employee (person_name, street, city)
works (person name, company name, salary)
company (company name, city)

Give an expression in the relational algebra to express each of the following queries:

a. Find the names of all employees who live in city "Miami".
b. Find the names of all employees whose salary is greater than $100,000.
c. Find the names of all employees who live in "Miami" and whose salary is greater than $100,000.

b) Consider the following bank database, where the primary keys are underlined: 4M CO2

branch(branch_name, branch city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan_number, branch_name, amount)
borrower (customer_name, loan_number)
account (account_number, branch_name, balance)
depositor (customer_name, account_number)

Construct the following SQL queries for this relational database.

a. Find all customers of the bank who have an account but not a loan.
b. Find the names of all customers who live on the same street and in the same city as "Smith".
c. Find the names of all branches with customers who have an account in the bank and who live in "Harrison".

c) What are Constraints in SQL? Explain with examples. 4M CO2

Q.3)

a) Define BCNF. 1M CO3

b) Explain Multivalued Functional Dependency. 1M CO3

Q.3) Solve Any Two

a) What is normalization? 4M CO3

a) When is a table in 1NF?
b) When is a table in 2NF?
c) When is a table in 3NF?

b) Examine the table shown below. 4M CO3

Branch No	Branch Address	Tel No	Mgr Staff No	Name
B001	Portland	503-555-3618	S1500	Tom Daniels
B002	Seattle	206-555-6756	S0010	Mary Martinez
B003	New York	212-371-3000	S0145	Art Peters
B004	Seattle	206-555-3131	S2250	Sally Stern

(a) Why is this table not in 3NF?
(b) Describe the process of normalizing the data shown in this table to third normal form (3NF).
(c) Identify the primary, (alternate) and foreign keys in your 3NF relations.

c) Let the relation R(A,B,C,D,E,F) 4M CO3

F: AB->CD, C->CA, B->E, D->B, E->F. Find the candidate keys for R.

Q.4)

a) Since every conflict-serializable schedule is view serializable, why do we emphasize conflict serializability rather than view serializability? 1M CO4

b) Explain the distinction between the terms serial schedule and serializable schedule. 1M CO4

Q.4) Solve Any Two 4M CO4

a) Consider the following two transactions:

T1:
read(A);
read(B);
if A = 0 then
B := B + 1;
write(B)
T2:
read(B);
read(A);
if B = 0 then
A := A + 1;
write(A)

Add lock and unlock instructions to transactions T1 and T2, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?

b) If deadlock is avoided by deadlock-avoidance schemes, is starvation still possible? Explain your answer. 4M CO4

c) Mention the differences between Trigger and Stored Procedures. 4M CO4

Q.5)

a) What do you understand by hashing in database? 1M CO5

b) Name four data mining techniques. 1M CO5

Q.5) Solve Any Two

a) What are indexes? Mention the differences between the clustered and non-clustered index. 4M CO5

b) What are the steps of data mining process? 4M CO5

c) Explain the query processing and optimization process with the help of diagram. 4M CO5

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END SEMESTER EXAMINATION (WINTER 2023)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE & ENGINEERING

(FIFTH SEMESTER)

Course: SOFTWARE ENGINEERING AND PROJECT MANAGEMENT **Course Code: UITT301**

Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1.	Identify the key activities in managing a software project.
CO2.	Compare different process models.
CO3	Concepts of requirements engineering and Analysis Modeling.
CO4.	Apply systematic procedure for software design and deployment.
CO5.	Compare and contrast the various testing and maintenance.

Instructions to Candidates:

1. All questions are compulsory.
2. Assume suitable data wherever necessary.
3. Illustrate your answer with the help of neat figures.

Q.1A) Solve the following.

i) Which step of SDLC performs cost/ benefit analysis? 1M CO1

a) Feasibility study b) Analysis c) Design d)None of these above

ii) Define Software Engineering. 1M CO1

Q.1B) Solve any two of the following.

i) What is SDLC. Write down the phases of SDLC? 4M CO1

ii) What is Prototype model. Explain advantages and disadvantages of Prototype model. 4M CO1

iii) Write a short note on Software Project Management. 4M CO1

Q.2A) Solve the following.

i) Define Data Dictionary. 1M CO2

ii) Which of the following is not a diagram studied in Requirement Analysis? 1M CO2

a) Use Cases b) Entity Relationship Diagram

c) State Transition Diagram d) Activity Diagram

Q.2B) Solve any two of the following.

i) What is Feasibility study? What are different types of feasibility study? Explain. 4M CO2

ii) Explain Functional and Non-Functional software requirement. 4M CO2

iii) Discuss about the different types of Requirement Engineering Process. 4M CO2

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Q.3A) Solve the following.

i) In Design phase, which is the primary area of concern? 1M CO3
a) Architecture b) Data c) Interface d) All of the above

ii) In the SDLC the focus shifts from the problem domain to the solution domain during the software design phase. [True/False] 1M CO3

Q.3B) Solve any two of the following.

i) What is Design process? Explain the objectives of Software Design process. 4M CO3

ii) Write short notes on 4M CO3
a)Architectural Design b)Detail Design

iii) Elaborate various User Interface Design Principles. 4M CO3

Q.4A) Solve the following.

i) COCOMO was developed initially by 1M CO4
a) B.Beizer b) Rajiv Gupta c) B.W.Bohem d) Gregg Rothermal

ii) Define Project Management. 1M CO4

Q.4B) Solve any two of the following.

i) What is Software Project Management and explain the need of software project management. 4M CO4

ii) What are different technique for cost estimation for a project. 4M CO4

iii) Write the difference between COCOMO I model and COCOMO II model. 4M CO4

Q.5A) Solve the following.

i) What are the various Testing Levels? 1M CO5
a) Unit Testing b) System Testing c) Integration Testing d) All of the mentioned

ii) Debugging is: 1M CO5
a) creating program code b) finding and correcting errors in the program code
c) identifying the task to be computerized d) creating the algorithm

Q.5B) Solve any two of the following.

i) What is software testing and explain different Level of Testing. 4M CO5

ii) Write the difference between white box testing and black box testing. 4M CO5

iii) Explain the Functional and Non-Functional software testing. 4M CO5

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END SEMESTER EXAMINATION (WINTER 2023)

BACHELOR OF TECHNOLOGY IN
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(FIFTH SEMESTER)

Course: WEB DEVELOPMENT **Course Code: UITT302**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1.	Explain the basic principles of web designing
CO2.	Implement all basic tags in HTML
CO3	Design web page using HTML, CSS & JAVA Script
CO4.	Design & Understand content management system
CO5.	Publish & host website

Instructions to Candidates:

1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1)

a) HTML tags are like keywords which defines that how web browser will format and display the content is True or False. 1M CO1

b) What is mean by SEO? 1M CO1

Q.1) Solve Any Two

a) Explain the Principle involved in designing a website? 4M CO1

b) What is web site design? Explain the concept of Planning process in website design? 4M CO1

c) What is World Wide Web? Explain the web Standard? 4M CO1

Q.2)

a) Which Tag is used for unordered list? 1M CO2

b) What is mean by hyperlink? 1M CO2

Q.2) Solve Any Two

a) Explain the Basic Structure of HTML Documents in brief? 4M CO2

b) Describe the concept of Working with Tables and Frame? 4M CO2

c) Evaluate how we can working with Images and Multimedia in html? 4M CO2

Q.3)

a) JavaScript is the programming language of the web? Is False or True? 1M CO3

b) The HTML …….. attribute is used to specify a class for an HTML element. 1M CO3

Q.3) Solve Any Two

a) Explain the concept of CSS with its property? 4M CO3

b) What is Java Script? Explain with its application? 4M CO3

c) What is CSS Styling? Explain in brief? 4M CO3

Q.4)

a) What is Content Management System? 1M CO4

b) When we use CMS there is no need to any database. 1M CO4
i)Yes ii)No iii)both i and ii

Q.4) Solve Any Two

a) Differentiate the content management from content management system? 4M CO4

b) Explain types of content management System in brief? 4M CO4

c) Why we use CMS? Explain application of CMS with its limitation? 4M CO4

Q.5)

a) We can only Save any website only in form of text format. Is True or False? 1M CO5

b) What is Title of Web page? 1M CO5

Q.5) Solve Any Two

a) Which procedure will be followed for creating of website? 4M CO5

b) Explain steps for creating a web site structure? 4M CO5

c) Evaluate the procedure Theme-publishing a website? 4M CO5

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END SEMESTER EXAMINATION (WINTER 2023)

BACHELOR OF TECHNOLOGY IN
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(FIFTH SEMESTER)

Course: COMPILER DESIGN **Course Code: UCST302**

Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1.	Understand basic concepts of compiler and different phases of compiler.
CO2.	Explain the role of a semantic analyzer and describe the purpose of a Syntax tree.
CO3.	Apply context free grammars, compiler parsing techniques, construction of abstract syntax trees, symbol tables
CO4.	Demonstrate lexical analysis using a finite automata along with error recovery
CO5.	Apply optimization techniques to intermediate code and generate machine Code for high level language program.

Instructions to Candidates:

1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1)

a) What is the use of a symbol table in compiler design? 1M CO1

a) Finding name's scope
b) Type checking
c) Keeping all of the names of all entities in one place
d) All of the mentioned

b) Who is responsible for the creation of the symbol table? 1M CO1

a) Assembler
b) Compiler
c) Interpreter
d) All of the mentioned

Q.1) Solve Any Two

a) Define Compiler and explain different phases of compiler in short. 4M

b) Discuss about the input buffering scheme in lexical analyser. 4M

c) Explain Bootstrapping. 4M

Q.2)

a) What is CFG?
   a) Regular Expression
   b) Compiler
   c) Language expression
   d) All of the mentioned

1M CO2

b) Which of the following error can a compiler check?
   a) Syntax Error
   b) Logical Error
   c) Both Logical and Syntax Error
   d) Compiler cannot check errors

Q.2) Solve Any Two

4M CO2

a) Evaluate the following grammar and eliminate left recursion-
   $E \rightarrow E + T / T$
   $T \rightarrow T \times F / F$
   $F \rightarrow id$

4M CO2

b) Determine left factoring in the following grammar-
   $S \rightarrow aSSbS / aSaSb / abb / b$

4M CO2

c) Evaluate the following grammar-

$$S \rightarrow (L) \mid a$$

$$L \rightarrow L , S \mid S$$

Parse the input string (a , (a , a)) using a shift-reduce parser.

Q.3)

a) Which attributes get values from the attribute values of their child nodes? 1M CO3

   a) Synthesized attributes
   b) Inherited attributes
   c) S-attributed SDT
   d) L-attributed SDT

b) Which of the following tasks should be performed in semantic analysis? 1M CO3

   a) Scope resolution
   b) Type checking
   c) Array-bound checking
   d) All of the above

Q.3) Solve Any Two

a) Draw the syntax tree and DAG for the following expression: 4M CO3
   (a*b)+(c-d)*(a*b)+b

b) Explain the usage of YACC parser generator in construction of a Parser 4M CO3

c) What you mean by Syntax tree? Explain the construction of syntax tree for the expression a-4+c 4M CO3

a) What is true about Syntax Directed Definitions? 1M CO4

a) Syntax Directed Definitions = Semantic rules + CFG
b) Syntax Directed Definitions + CFG = Semantic rules
c) CFG + Semantic rules = Syntax Directed Definitions
d) None of the above

b) Which of the following does an address code involve? 1M CO4
a) No unary operators
b) Exactly 3 address
c) At most Three address
d) None of the mentioned

Q.4) Solve Any Two

a) Explain different Code optimization techniques with examples. 4M CO4

b) Determine syntax tree and postfix notation for the following expression: 4M CO4
a+(b*c)-d-e/(f+g)

c) Describe intermediate code and write the two benefits of intermediate code generation. 4M CO4

Q.5)

a) Which of the following can detect an error if a programmer by mistake writes multiplication instead of division? 1M CO5
a) Interpreter
b) Compiler or interpreter test
c) Compiler
d) None of the mentioned

b) Which of the following concept of FSA is used in the compiler? 1M CO5
a) Code optimization
b) Code generation
c) Lexical analysis
d) Parser

Q.5) Solve Any Two

a) Illustrate quadruples, triples and indirect triples for the expression: 4M CO5
(a*b)+(c+d)-(a+b+c+d)

b) Discuss the following code optimization techniques with examples-- 4M CO5
a) Constant propagation b) Strength reduction c) Code Motion

c) Explain the code generation algorithm for expression x= (a+b)- ((c+d)-e) 4M CO5

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END SEMESTER EXAMINATION (WINTER 2023)

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING

(FIFTH SEMESTER)

Course: ENGINEERING ECONOMICS & INDUSTRIAL MANAGEMENT **Course Code: UHUT303**

Time: 2:0 Hrs **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1.	Understand the basic concepts of Micro & Macro-Economics and its applications.
CO2.	Implement the fiscal policies for government organizations and NGO's.
CO3	Analysing the functions of Management and its importance.
CO4.	Evaluate the marketing strategies.
CO5.	Formulate the scope of financial management.

Instructions to Candidates:

1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) A

a) Determine the price elasticity of demand given that, 1M
   i. The quantity demanded for product M is 1100 units at a price of Rs. 200.
   ii. The price declines to Rs. 150 and the quantity demanded increases to 1400 units.

b) Define the term. 1M
   i. Monopoly

Q.1)B Solve Any Two

a) What is elasticity of demand? Illustrate significance of elasticity of demand? 4M

b) Describe various types in factor of production. 4M

c) What is indifference curve? Illustrate it suitable examples. 4M

Q.2)A

a) Enlist the phases of business cycle. 1M

b) What is inflation? 1M

Q.2)B Solve Any Two

a) Differentiate between direct and indirect taxes. 4M

b) Summarize liberalization, globalization and privatization as a part of new economic policy. 4M

c) Explore monetary and fiscal policies of the government 4M

Q.3)

a) _____ leads to higher job satisfaction. 1M CO3

(a) Planning
(b) Budgeting
(c) Supervision
(d) Motivation

b) Which of the following is not an element of directing? 1M CO3

(a) Motivation
(b) Communication
(c) Planning
(d) Supervision

Q.3) Solve Any Two

a) Elaborate the importance of effective communication in an organization. 4M CO3

b) What is the directing function of management? Summarize the characteristics of directing. 4M CO3

c) Discuss Fayol's management principles. 4M CO3

Q.4)A

a) Enlist at least 4 different pricing strategies. 1M CO4

b) Which of the following statements is correct? 1M CO4

A. Marketing is the term used to refer only to the sales function within a firm
B. Marketing managers usually don't get involved in production or distribution decisions
C. Marketing is an activity that considers only the needs of the organization, not the needs of society as a whole
D. Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large

4)B Solve Any Two

a) Explain the product life cycle with suitable sketch. Elaborate the different strategies at each stage. 4M CO4

b) Sketch & discuss concept of channels of distribution of consumer product. 4M CO4

c) What is marketing mix? Describe the 4 P's strategies in marketing mix. 4M CO4

a) If you deposit Rs. 10000 in a fixed account of your bank at 9 % interest per year; how much you will get after 1 year? 1M CO5

b) Funds raised through loans or borrowings are _____. 1M CO5

(a) Borrowed funds
(b) Owners equity
(c) Share capital
(d) Retained earnings

a)	What is ratio analysis? Explain objectives and advantages of ratio analysis.	4M	CO5
b)	Discuss the tasks and responsibilities of modern financial manager.	4M	CO5
c)	Summarise the different sources of finance in detail.	4M	CO5

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END SEMESTER EXAMINATION (WINTER 2023)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE & ENGINEERING

(FIFTH SEMESTER)

Course: REQUIREMENT ENGINEERING **Course Code: UCST321**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1.	To design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
CO2.	To understand professional, ethical, legal, security, and social issues and responsibilities
CO3	To use current techniques, skills, and tools necessary for computing practices
CO4.	To develop and present a talk on the status of a project
CO5.	To develop a written report on a project based on Requirements

Instructions to Candidates:

1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1)

a) Which one of the following is not a step of requirement engineering? 1M CO
a) Elicitation b) design c) analysis d) documentation

b) Which one of the following is a functional requirement? 1M CO
a) Maintainability b) Portability c) Robustness d) None of the mentioned

Q.1) Solve Any Two

a) What is Software Prototyping? Distinguish between the term inception, elicitation, & elaboration with reference to requirements? 4M (

b) Explain Characteristics of a Requirements Engineering. 4M (

c) Explain Requirements Engineering steps of activities. 4M

Q.2)

a) Which one of the following is a requirement that fits in a developer's module? 1M
a) Availability b) Testability c) Usability d) Flexibility

b) Functional requirements capture the intended behaviour of the system. 1M
a) True b) False

Q.2) Solve Any Two

a) Explain functional requirements. 4M

b) Explain classes of non- Functional requirements 4M

c) Explain User requirements and System requirements. 4M

Q.3)

a) Which is one of the most important stakeholder from the following? 1M

a)Entry level personnel b) Middle level stakeholder

c) Managers d) Users of the software

b) What is the first step of requirement elicitation? 1M

a) Identifying Stakeholder b) Listing out Requirements

c) Requirements Gathering d) All of the mentioned

Q.3) Solve Any Two

a) What is Use case? 4M

b) Explain the Involvement of Stakeholders in Project. 4M

c) Explain Stakeholder Identification and Understanding Stakeholders. 4M

Q.4)

a) and are the two issues of Requirement Analysis. 1M

a) Performance, Design b) Stakeholder, Developer

c) Functional, Non-Functional d) None of the mentioned

b) Which of the following property does not correspond to a good Software Requirements Specification (SRS)? 1M

a) Verifiable b) Ambiguous c) Complete d) Traceable

Q.4) Solve Any Two

a) Explain requirements modeling techniques. 4M

b) Why is requirements modeling important and explain requirements model structure? 4M

c) Explain the requirements modeling and requirements modeling elements? 4M

Q.5) a) In which model testers and developers work together in the project? 1

a) Agile model b) Waterfall model c) Dev Model de d) none of them.

b) Which of the following is not a diagram studied in Requirement Analysis? 1

a) Use Cases b) Entity Relationship Diagram

c) State Transition Diagram d) Activity Diagram

Q.5) Solve Any Two

a) What are the benefits of agile scrum methodology?

b) Explain the Three Perspectives of Requirements

c) Explain principles of requirements validation