

(DMCS21)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

USER INTERFACE DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. List out the important human characteristics that have an influence on design and explain them in detail.
2. Explain various methods of requirement analysis in detail.
3. Write a detailed notes on Keyboards, Keyboard layouts, Keys and Functions keys
4. Explain different types of menus, its strengths, weaknesses and applications.
5. (a) Discuss the procedure for choosing colors for statistical graphical screens.
(b) What are the issues to be considered in designing title bar and message bar?
6. Discuss about users tasks and needs, which are important in user interface design.
7. Discuss psychological and physical user responses to poor design.
8. What is Fitt's law? Where it is used?
9. What are novel pointing devices? Explain their features.

(DMCS21)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

USER INTERFACE DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write the advantages and disadvantages of state charts.
2. Explain the guidelines for selecting the proper device based controls.
3. Discuss the important functions of menus.
4. What is image map? Write its uses, advantages and disadvantages.
5. Digital scanners.
6. Limitations of plotters.
7. Guidelines for the pointers.
8. Building metaphors.
9. Menu Navigation.

(DMCS22)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

COMPUTER GRAPHICS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about working mechanism of various graphic input devices with neat sketch.
2. Derive all necessary formulas for Bresenham line drawing algorithm. Bresenham line drawing algorithm is used to draw a line from (1,2) to (7, 5). Determine all the pixels which will be on as the line is drawn.
3. (a) Perform the 45° rotation of triangle A(0, 0), B (1, 1), C (5,2) about point P(-1,-1)
(b) Derive the matrix for 2-D reflection and shearing.
4. Explain in detail the Sutherland-Hodgeman clipping algorithm with an example.
5. (a) Derive the transformation matrix for rotation about any axis in 3 – D.
(b) Explain Z-buffer visible surface determination algorithm.
6. What is aliasing? How to compensate the aliasing?
7. Explain boundary fill algorithm with merits and demerits.
8. Justify that two successive rotation is additive.
9. Differentiate parallel projection from perspective projection.

(DMCS22)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

COMPUTER GRAPHICS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write about quadratic surfaces and super quadratic surfaces.
2. Classify the visible surface detection algorithms.
3. What is Bezier curve? List all its important properties.
4. Write about composite transformation.
5. Define scan conversion.
6. Define frame buffer.
7. What is flood filling?
8. What is meant by hidden surface?
9. What is shear transformation?

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

OBJECTED ORIENTED ANALYSIS AND DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. (a) Why is it necessary to have a variety of diagrams in a model of a system? Discuss.
(b) Explain the conceptual model of UML.
2. (a) Which UML diagrams give a static view and which gives dynamic views of a system? Explain.
(b) How generalization/specialization contrasted with more code reuses? Illustrate.
3. (a) Define Software Architecture, Explain 4+1 view model of systems architecture.
(b) Explain UML approach to software development life cycle.
4. (a) Design a Class diagram that depicts various relationships in class diagrams.
(b) Explain the use of forward engineering and reverse engineering in class diagrams.
5. (a) Discuss the common uses and properties of sequence diagrams and collaboration diagrams.
(b) Define event and signal. Explain any four kinds of events modeled by UML.
6. What is model? What are the aims of modeling?
7. Discuss the standard stereotypes UML Defines.
8. How to model different levels of abstraction?
9. Differentiate between aggregation and composition with example.
10. Compare and contrast object diagram with class diagram.

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

OBJECTED ORIENTED ANALYSIS AND DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Describe about modeling flow of control by time ordering.
2. Define node and contrast node with components.
3. Design State Chart diagram for Library application.
4. List Object oriented languages and non-object oriented languages.
5. What is the use of UseCase diagram?
6. What are the components of activity diagram?
7. Illustrate family of signals.
8. Summarize various parts of a transition.

(DMCS24A)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

ADVANCED COMPUTER ARCHITECTURE

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about the design of pipelined instruction units in detail.
2. Explain about Illiac-IV system architecture.
3. Explain about the SIMD array processors in detail.
4. Explain about the classification of multiprocessor operating systems.
5. Explain about the Cray X-Mp architecture.
6. Explain about the multiplicity of instruction schemes in detail.
7. Explain about the instruction prefetch scheme in instruction pipelines.
8. Explain about the Cray-I super computer.
9. Explain about multiport memories in detail.

(DMCS24A)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

ADVANCED COMPUTER ARCHITECTURE

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about the Time-shared bus system.
2. Explain about the dimensions of multiprocessor management.
3. Explain about the Systolic Architecture.
4. Explain about the static dataflow computers.
5. Explain about the memory hierarchy.
6. Explain about the applications of pipeline chaining.
7. Explain about the language features to exploit parallelism.
8. What is system deadlock problem?
9. What is the difference between control flow and data flow computers?

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

MICROPROCESSOR AND APPLICATIONS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about the data representation and address of microcomputer system.
2. Explain about 8086 addressing modes with examples.
3. Explain about Direct Memory Access transfer with a neat flow chart.
4. Explain about process management in iRMX 86.
5. Explain about iRMX 86 memory management mechanism.
6. Explain about microcomputer systems.
7. Explain about assembler instruction formats.
8. Explain about 8086 NOP and HLT instructions.
9. List different types of flag manipulation instructions with examples.

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

MICROPROCESSOR AND APPLICATIONS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about relocation.
2. Explain about 8086 procedures.
3. Explain about multiprogramming.
4. Explain about semaphore operations in IRMX.
5. What is an effective address?
6. What is the purpose of HLT instruction?
7. What is Stack?
8. What is multiprogramming?
9. What is Virtual Memory?

(DMCS25A)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Computer Science

Second Year

CRYPTOGRAPHY AND NETWORK SECURITY

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Describe the model for Network Security with neat diagram. Discuss in detail about various types of Security attacks with neat diagrams.
2. (a) What are the different transposition techniques? Explain in detail.
(b) Briefly define the mono alphabetic cipher. What is the difference between a mono alphabetic cipher and a polyalphabetic cipher?
3. Give a neat sketch to explain the concept of Secured Hash Algorithm (SHA).
4. Explain DES algorithm with suitable examples. Discuss its advantages and limitations.
5. Give IP Security architecture with neat diagram. Explain the steps involved in performing Secure Inter- Branch Payment Transactions.
6. Describe in detail about Conventional Encryption Model.
7. What is Steganography? Explain its features.
8. What is symmetric key cryptography? Discuss its advantages and limitations.
9. What is a Feistel Cipher? Name the Ciphers that follow Feistel Structure.

(DMCS25A)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Computer Science

Second Year

CRYPTOGRAPHY AND NETWORK SECURITY

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain Byte substitution and Shift row operation of AES.
2. Explain RSA algorithm with suitable examples.
3. What are the criterion of cryptographic hash function?
4. List the characteristics of a good firewall implementation.
5. What is message authentication?
6. What is Birthday Attack on Digital Signatures?
7. What is Firewall?
8. What is meant by IP spoofing?
9. Define confidentiality.

(DMCS25B)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

TCP/IP

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about LANs and Point-to-Point WANs.
2. Discuss about Dynamic Routing protocol.
3. Describe the User Datagram Protocol.
4. Explain about Unicast Routing protocols.
5. Explain about BGP.
6. Explain about TCP versions.
7. Explain about subnetting.
8. Discuss about the purpose of routing tables.
9. Write about different types of messages in ICMP.

(DMCS25B)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

TCP/IP

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about the UDP operations.
2. Explain about flow control in TCP.
3. Explore different multicasting protocols.
4. Explain about Telnet.
5. What is IP address?
6. What is a datagram?
7. Define TCP checksum.
8. What is NVT?
9. What is, out of band signaling?

(DMCS26)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

DATA WAREHOUSING AND DATA MINING

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. With the help of a neat diagram explain the 3-tier architecture of a data warehouse. Clearly state the differences between “Data Warehouses” and “Operational Database Systems.
2. What is Cuboid? Explain various OLAP Operations on Data Cube with example.
3. Discuss various activities of ETL process? And also components of ETL architecture.
4. Explain about the process of loading oracle warehouse and features of oracle warehouse builder.
5. Write the steps of the k-means clustering algorithm. Also state its limitations.
6. Explain the ‘Star’ and ‘Snowflake’ schemas of data warehouse.
7. Write about meta data repository.
8. How to use B-Tree Indexes in Data Warehouses?
9. Describe the methods for handling the missing values in data cleaning.

(DMCS26)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

DATA WAREHOUSING AND DATA MINING

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Describe efficient processing of OLAP queries.
2. What are various types of datasets?
3. What do you mean by clustering? Explain different types of clusters.
4. How to estimate the probabilities from data? Explain through Naïve Bayes classifier
5. Define OLTP.
6. Define warehouse indexing.
7. What is data preprocessing?
8. What is physical data warehouse?
9. Give the functionality of oracle warehouse builder?

(DMCS27A)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

EMBEDDED SYSTEMS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain the term 'Interrupt Latency'. Discuss various measures to reduce the interrupt latency in embedded applications.
2. Discuss about how disabling interrupts effects the system response and alternative to disabling interrupts to solve shared data problem.
3. Discuss about the Round-Robin-with-Interrupts with an example.
4. Explain about encapsulating semaphores and queues with suitable programs.
5. Discuss about various laboratory tools used for embedded system debugging.
6. Explain about RAM.
7. Discuss about the Power and Decoupling.
8. Explain about Wait signals and Wait states.
9. Explain about the DMA transfer with a neat sketch.

(DMCS27A)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

EMBEDDED SYSTEMS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Explain about round robin architecture.
2. Explain about semaphore problems.
3. Discuss the Hard-real time scheduling considerations.
4. Explain about software only monitors.
5. What is CPLD?
6. What if two tasks with the same priority are ready?
7. If two interrupts happen at the same time, which interrupt routine does the microprocessor do first?
8. What is Test Scaffold Code?
9. What is a Host Machine?

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

IMAGE PROCESSING

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Discuss the image acquisition using a single sensor, sensor strips and sensor arrays.
2. (a) With necessary equations, explain about Homomorphic filtering.
(b) Explain the concept of minimum mean square error filtering.
3. Draw the functional block diagram of image compression system and explain the purpose of each block.
4. Discuss about edge linking using local processing.
5. Explain the basics of intensity thresholding in image segmentation.
6. Explain the various basic relationships between pixels.
7. Describe image formation in the eye with brightness adaptation and discrimination.
8. What is Walsh Transform and write its properties?
9. Explain about alpha-trimmed mean filter?

(DMCS27B)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

IMAGE PROCESSING

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write the difference between image restoration and image enhancement.
2. Explain the effect of noise in edge detection.
3. What is image compression? Why it is needed?
4. What is meant by spatial resolution and explain its significance.
5. Define segmentation.
6. What is meant by pixel depth?
7. Define D_4 and D_8 distances.
8. Define duality of erosion.
9. What is image negative transformation?

(DMCS28A)

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

ARTIFICIAL INTELLIGENCE

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. (a) Given two jugs with no measuring marker, a 4 gallon jug and 3-gallon jug. There is a pump to fill the jug with water. How do you get 2-gallons of water in the 4-gallonjug? Give the state space for the problem. Describe the production rules and provide a possible solution with the help of state space graph.
(b) Explain desirable characteristics of control strategies as used in production systems.
2. (a) Write about A* algorithm with suitable example.
(b) Write about Means - Ends analysis algorithm and trace this algorithm by Robot Navigation problem.
3. What is matching? Discuss different matching techniques.
4. Describe the various components of script? Write a script to a person go to a coffee shop.
5. What is an expert system? Discuss various components of expert system architecture in -detail.
6. State Tic-Tac-Toc problem? Construct state space tree for this problem.
7. When does simulated annealing algorithm behave like hill climbing?
8. Differentiate forward and backward reasoning.
9. Consider the following axioms
 - (a) P
 - (b) $(P \wedge Q) \rightarrow R$
 - (c) $(S \vee T) \rightarrow Q$
 - (d) T

Convert them into clause form and derive R using resolution.

(DMCS28A)

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

ARTIFICIAL INTELLIGENCE

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write about partitioned semantic net with example.
2. Explain about Dempster – Safer theory with example.
3. Write about natural deduction with suitable example.
4. Describe different phases of natural language processing.
5. Give any two applications of AI.
6. Define Abduction.
7. Define frame.
8. Define monotonic reasoning.
9. Define Resolution.

ASSIGNMENT - 1

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

COMPILER DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Show the output produced by different stages in compiler for the expression

$a := b * c / 36$; where a, b and c are real numbers.

2. Design CLR Parser for the following grammar

$$S \rightarrow L = R \mid R$$
$$L \rightarrow * R \mid a$$
$$R \rightarrow L$$

3. Translate the expression $(a + b) / (c + d) * (a + b / c) - d$ into quadruples, triples and indirect triples.

4. Optimize the following loop and also construct flow graph:

Begin

Prod=0

i = 1

do

Begin

Prod = Prod + a[i] * b[i]

i = i + 1

End

While ($i \leq 20$);

End.

5. Discuss about various storage allocation strategies.

6. Describe compiler construction tools with example.

7. Construct DFA for the regular expression : $(0+1)^*011$.

8. What is input buffering? Describe different input buffering schemes.

9. Explain about s-attributes and l-attributes with suitable example.

ASSIGNMENT - 2

M.Sc. DEGREE EXAMINATION, MARCH 2023

Second Year

Computer Science

COMPILER DESIGN

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Construct the operator precedence parse table for the grammar:

$$E \rightarrow EAE|(E)|-E|a, \quad A \rightarrow +|-|*|/|\uparrow.$$

2. Construct DAG for the following basic block and generate code from DAG using only one register.

$$d = b * c$$

$$e = a + b$$

$$b = b * c$$

$$a = e - d$$

3. Write short notes on peephole optimization.
4. Generate machine code for the following instruction:

$$v = a + (b * c) - d.$$

5. Define bootstrapping of a compiler.
6. Define syntax directed translation.
7. Define left recursion.
8. Define copy propagation.
9. What is abstract syntax tree?