

**(DMCS 21)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

USER INTERFACE DESIGN

Time : Three hours

Maximum : 70 marks

SECTION A – (3 × 15 = 45 marks)

Answer any THREE questions

1. Write about usability requirements and usability motivations of interactive systems.
2. Discuss in detail about types of posture used during the behavior presentation of user interface design.
3. Explain about the working with bit maps and icons with suitable example.
4. Explain about the various presentation controls and their usage with example.
5. (a) Illustrate the menu types with suitable example.  
(b) Explain the modeless dialog problem and its solution.

SECTION B – (5 × 4 = 20 marks)

Answer any FIVE of the following.

6. Write the advantages of having a good user interface design.
7. Briefly discuss “repositioning”, "resizing" and "reshaping" idioms.
8. What are the different problems and their solutions in the drag and drop operations?
9. Write about various cursor hinting techniques.
10. What is Orchestration and flow in presentation? Illustrate with example.
11. Write about any two popular “Windows Postures”.
12. What is the importance of Task coherence? Give an example.
13. Describe the different categories of messages?

SECTION C – (5 × 1 = 5 marks)

Answer ALL questions.

14. Give the tasks of the dialog box.
  15. What is “negative audible feedback”?
  16. List states of window.
  17. What is Gizmo?
  18. What is list box?
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M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Computer Science

Second Year

COMPUTER GRAPHICS

Time : Three hours

Maximum : 70 marks

SECTION A – (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. (a) Explain about working CRT monitors with neat diagram.  
(b) Write about the Flood fill algorithm for 8 connected region.
2. Explain Bresenham's line algorithm and show how Bresenham's line algorithm draws a line that starts with (1, 2) and end with (7, 5). Determine all the pixels which will be on as the line is drawn.
3. Explain the Cohen – Sutherland line clipping algorithm. Use this algorithm to find out the visible portion of the line P(40, 80) and Q(120, 30) inside the window, the window is define as ABCD: A(20, 20), B(60, 20) C(60, 20) D(20, 40)
4. Differentiate parallel and perspective projections and derive their projection matrices.
5. Explain about Depth sorting and Area sub division methods in detail.

SECTION B – (5 × 4 = 20 marks)

Answer any FIVE questions from the following.

6. Explain DDA line drawing algorithm.
7. Differentiate raster scan display and random scan display.
8. Explain odd-even method of determining polygon inside points.
9. What is shear transformation? Explain X-shear and Y-shear with example.
10. What is z buffer technique? Write the use of depth and frame buffer.

11. Derive transformation matrix for 2D rotation.
12. Describe the input functions and input modes.
13. Write about visible line and surface identification.

SECTION C – (5 × 1 = 5 marks)

Answer ALL questions.

14. Define window and view port.
  15. Define composite transformation.
  16. What is meant by antialiasing?
  17. What is test clipping?
  18. What is flood filling?
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M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

COMPUTER SCIENCE

OBJECT ORIENTED ANALYSIS AND DESIGN

Time : Three hours

Maximum : 70 marks

SECTION A – (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. (a) Explain about various elements of software-intensive system with neat architecture.  
(b) Enumerate the steps to model the client-server systems.
2. Draw the behavioral diagrams for unified library application and explain them briefly. Give assumptions, if any made.
3. Explain with suitable example, which diagrams give a static and which diagrams give dynamic view of a system.
4. What is meant by state machine? Discuss about sequential sub states and history states with an example.
5. (a) How the recursion will be represented in a sequence diagram? Give an example.  
(b) Draw use case diagram for hospital information system aimed at collecting and storing complete information pertaining to the patients.

SECTION B – (5 × 4 = 20 marks)

Answer any FIVE questions

6. Contrast is-a relationship with has-a relationship.
7. State and explain the common modeling techniques of use case diagrams.
8. How to model an embedded system?

9. Illustrate the conceptual model of UML in detail.
10. What is an event? What are different types of events?
11. Explain about links and associations in detail.
12. Briefly explain various activity states and action states in the activity diagram.
13. Enumerate the steps in modeling timing constraints.

SECTION C – (5 × 1 = 5 marks)

Answer ALL questions.

14. What is visibility of an element owned by a package?
  15. Distinguish between interface and class.
  16. What are the uses of interaction diagram?
  17. What is meant by high cohesion?
  18. What is a deployment diagram?
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**(DMCS 24 A)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

**ADVANCED COMPUTER ARCHITECTURE**

Time : Three hours

Maximum : 70 marks

**SECTION A — (3 × 15 = 45 marks)**

Answer any **THREE** questions from the following.

1. Explain about the multiplicity of instruction data streams and parallel processing applications.
2. Explain about MPP system architecture.
3. Explain about the various processor synchronization mechanisms in detail.
4. Explain about the classification of multiprocessor operating systems.
5. Explain about the Systolic Array architecture in detail.

**SECTION B — (5 × 4 = 20 marks)**

Answer any **FIVE** questions from the following.

6. Explain about the concepts of virtual memory systems.
7. Explain about the instruction prefetch schemes in detail.
8. Explain about the applications of Illiac-IV.
9. Explain about Parallel Memory Allocation.
10. Explain about the Time-shared bus system.
11. Explain about the classification of parallel algorithms.
12. Explain about different types of Multiprocessor Systems.

13. Explain about the Operating Systems for IBM multiprocessors.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is the advantages using multiplicity of instruction data streams.
  15. What is SIMD array processor?
  16. What is Parallel memory allocation?
  17. What is Dead Lock?
  18. Write the features of data flow computers.
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**(DMCS 24B)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

**MICROPROCESSOR AND APPLICATIONS**

Time : Three hours

Maximum : 70 marks

**SECTION A — (3 × 15 = 45 marks)**

Answer any **THREE** questions from the following.

1. Explain about 8086 internal operations with an example.
2. Explain about 8086 instruction formats with examples.
3. Explain about the logical instructions and shift and rotate instructions.
4. Explain about DMA transfer with a neat sketch.
5. Explain about iRMX 86 semaphore operations.

**SECTION B — (5 × 4 = 20 marks)**

Answer any **FIVE** questions from the following.

6. Explain about the features of 8086 microprocessor.
7. Explain about different types of data representation.
8. Explain about NOP and HLT instructions.
9. List different types of flags available in 8086 and write their functions.
10. Explain about linking.
11. Explain about programmed I/O operation.
12. Explain about iRMX 86 memory management.
13. Explain about virtual memory.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Explain about the data representation?
  15. What is an indirect addressing mode?
  16. What is an interrupt?
  17. What is a process state?
  18. List key features of iRMX 86.
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M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Computer Science

Second Year

**CRYPTOGRAPHY AND NETWORK SECURITY**

Time : Three hours

Maximum : 70 marks

**SECTION A—(3 × 15 = 45 marks)**

Answer any **THREE** questions from the following.

1. Discuss various substitution and transposition techniques with suitable examples.
2. Explain about single round and triple round of DES algorithm.
3. Explain about the Diffie – Hellman key exchange algorithm.
4. (a) Describe MD5 message digest algorithm.  
(b) What are the key components of internet mail architecture?
5. Describe the process involved in digital signatures. Explain different digital signatures.

**SECTION B —(5 × 4 = 20 marks)**

Answer any **FIVE** questions from the following.

6. What is the difference between passive and active security threats?
7. Explain Byte substitution and Shift row operation of AES in detail.
8. Write about steganography.
9. Compare HMAC with CMAC.
10. What characteristics are needed in a secure hash function?
11. Describe different types of firewalls.
12. What are the services provided by IPSec?
13. Briefly explain Encapsulating IP Security Payload?

SECTION C – (5 × 1 = 5 marks)

Answer ALL questions.

14. Define the term cryptanalysis.
  15. What is replay attack?
  16. Define Avalanche Effect.
  17. What is message authentication?
  18. What is Birthday Attack on Digital Signatures?
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**(DMCS 25 B)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

TCP/IP

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. Discuss about the four levels of addresses are used in the TCP/IP protocols.
2. Explain about RARP protocol.
3. Explain about the IGMP operation and Encapsulation in detail.
4. Explain about Interior and Exterior routing in detail.
5. Explain about Domain Name System.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions from the following.

6. Explain about the classful addressing with an example.
7. Explain about Bluetooth.
8. Explain about Error reporting in ICMP.
9. Write about ARP packages
10. Explain about the Next-Hop Method and Network-Specific Method Forwarding Techniques.
11. Explain about windows used in TCP.
12. Explain about DHCP protocol.
13. Explain about Client-Server model.

SECTION C — (5 × 1 = 5 marks)

Answer ALL question

14. What is LAN.
  15. What is a process to process communication.
  16. Define TCP checksum.
  17. What is Name Space?
  18. What is Out-of-band signaling?
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**(DMCS 26)**

M.Sc. DEGREE EXAMINATION,  
NOVEMBER 2021.

Second Year

Computer Science

DATAWARE HOUSING AND DATAMINING

Time : Three hours

Maximum : 70 marks

SECTION – A

Answer any THREE questions

(3 × 15 = 45)

1. Explain about 3-tier architecture of data warehouse and how to manage data warehouse project data.
2. Discuss data warehousing development methodologies.
3. Explain the functionality of oracle data warehouse builder.
4. What are the different activities of ETL process? And also components of ETL architecture.
5. Explain about different classification algorithms in detail.

SECTION – B

Answer any FIVE questions from the following

(5 × 4 = 20)

6. Write about metadata repository of a data warehouse.
7. Briefly explain about data marts and star schema.
8. What is meant by missing values? How to fill these missing values in data warehouse?
9. Differentiate OLAP and OLTP.
10. Write short notes on data warehouse indexing.

11. Explain about association rule mining with suitable example.
12. Describe Data granularity in Data Warehouse.
13. Write the features of oracle warehouse.

SECTION – C

Answer all questions

(5 × 1 = 5)

14. What is data reduction?
  15. Define data cleaning.
  16. What is meant by data transformation?
  17. What is physical data warehouse?
  18. Define rule based classification.
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**(DMCS 27 A)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

**EMBEDDED SYSTEMS**

Time : Three hours

Maximum : 70 marks

**SECTION A**

(3 × 15 = 45 marks)

Answer any **THREE** questions from the following.

1. List and compare various microprocessors used in embedded systems.
2. For each of the following situations, discuss which of the three shared-data protection mechanisms seems most likely to be best and explain why.
  - (a) Task M and Task N share an int array, and each often must update many elements in the array.
  - (b) Task P shares a single char variable with one of the Interrupt routines.
3. Explain about Function Queue scheduling algorithm.
4. Discuss about Hard Real-Time Scheduling Considerations.
5. Discuss about various laboratory tools used for embedded system debugging.

**SECTION B (5 × 4 = 20 marks)**

Answer any **FIVE** questions from the following.

6. Explain about ROM variants.
7. Discuss about the Power Consumption and Throughput.
8. Explain about alternative to disabling interrupts with suitable code.
9. Explain about UART.
10. Explain about Interrupt Routines in an RTOS Environment.
11. Explain about Pipes and Timer functions in detail.
12. Explain the characteristics of assembly language.
13. Explain about Locator maps.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is an Embedded System?
  15. What if two tasks with the same priority are ready?
  16. What is semaphore?
  17. Explain about mailboxes in RTOS.
  18. What is a Host Machine and Target machine?
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**(DMCS 27 B)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

IMAGE PROCESSING

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions.

1. (a) Describe image Formation in the eye with brightness adaptation and discrimination.  
(b) Explain the components of image processing system.
2. Explain about smoothing Spatial filtering and sharpening spatial filters.
3. Define Histogram of Image. Explain the concept of Histogram Equalization technique for Image enhancement.
4. Draw the functional block diagram of image compression system and explain the purpose of each block.
5. Discuss edge linking and boundary detection process of segmentation.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions.

6. What are the steps in digital image processing?
7. Find the Haar transformation matrix for  $N = 8$ .
8. Write about grey level image transformation.
9. Write the expression for contra harmonic mean filter and explain its use in image restoration.

10. Explain about Homomorphic filtering.
11. Explain two-band sub band coding and decoding system.
12. How can you control Over segmentation problem?
13. Explain about edge detection using gradient operator.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define neighbors of a pixel.
  15. What is the difference between image restoration and image enhancement?
  16. Define Histogram of Image.
  17. Define Max and Min filters.
  18. Define thresholding in image segmentation.
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**(DMCS 28 A)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

ARTIFICIAL INTELLEGINCE

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. (a) Discuss the Problem Characteristics of Artificial Intelligence.  
(b) Solve the following crypt arithmetic problem:  
SEND + MORE = MONEY
2. Illustrate Best – First Search algorithm with suitable example.
3. (a) Discuss various approaches to representing the knowledge.  
(b) Illustrate Unification algorithm with example.
4. Illustrate justification truth maintenance system with ABC murder story.
5. Explain each step of Natural Language Processing in detail.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions from the following.

6. State and solve 8 – puzzle problem using state space problem.
7. Write about simulated annealing.
8. Write a procedure to convert well-formed formula into clause form.
9. Explain about augmented problem solver.
10. What is frame? Explain frame problem with suitable example.
11. Describe various components of script.
12. Write about case grammars.
13. Explain about expert system shell.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What are the limitations of hill climbing?
  15. Define non-monotonic reasoning.
  16. Define partition semantic net.
  17. Define resolution.
  18. Define expert systems.
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**(DMCS28B)**

M.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Second Year

Computer Science

COMPILER DESIGN

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. Discuss different phases of compiler and also give the differences between Pass and Phase.

2. Construct CLR Parsing table for the grammar

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

3. Explain about syntax directed definition and syntax directed translation.

4. State and explain different storage allocation strategies.

5. (a) Describe different methods that are used in 'Peep – hole optimization'.

(b) Generate code for the following expression and compute its cost

$$X := (a + b) * (c - d) + ((e/f) * (a + b))$$

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions from the following.

6. What is Input buffering? Describe different input buffering schemes.

7. What is shift reduce parsing? How the shift reduce parser implemented by stack?

8. Write about static and dynamic Type checking.

9. Compute FIRST and FOLLOW for the following grammar

$$S \rightarrow A \quad A \rightarrow aB | Ad \quad B \rightarrow bBC | f \quad C \rightarrow g$$

10. What is Annotated parse tree? Construct annotated parse tree for the array assignment statement  $x = A[y, z]$
11. Generate Three address code for the following switch statement
- ```
switch (ch)
{
  Case 1 : c = a + b;
           break;
  Case 2 : c = a - b;
           break;
  Case 3 : c = a * b;
           break;
}
```
12. Write a procedure to identify basic blocks and constructing flow graph.
13. Write about loop invariant and loop jamming with example.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define operator precedence grammar.
15. Define left recursion.
16. What is meant by Constant folding?
17. What are the entities of symbol table?
18. Define back patching.
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