

(DMCS 21)

M.Sc. DEGREE EXAMINATION,
DECEMBER 2019.
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 five major interactive styles and also explain their advantages and disadvantages.
2. Discuss in detail about three dominant paradigms in the design of user interfaces with examples.
3. Critically analyze the “Selection Gizmos” offered in windows.
4. What are the types of mouse button? Explain in detail about the types of operations that can be done with them.
5. Discuss different issues involved in designing of dialog boxes.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE of the following.

6. Describe usability measures and requirements of interactive systems.
7. Write about “repositioning”, “resizing” and “reshaping” idioms.
8. Describe the characteristics of user interface design.
9. Write about any four kinds of graphical menus.
10. What is posture? Describe different postures.
11. Describe various states of windows.
12. What are the tool bar? Explain their components using a sample user interface.
13. Write short notes on message boxes.

SECTION C — (5 × 1 = 5 marks)

Answer all questions.

14. Define task coherence.
 15. What is significance of drag and drop operation?
 16. Define Orchestration.
 17. What is the need of alerts?
 18. What is list box?
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M.Sc. DEGREE EXAMINATION,
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COMPUTER GRAPHICS

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions.

1. (a) Describe the Raster scan display system with complete architecture.
(b) Write about various elements of color CRT monitors.
2. Write the Midpoint Ellipse generation algorithm.
3. Explain Cohen-Sutherland line clipping with example.
4. Differentiate parallel and perspective projections and derive their projection matrices.
5. Explain about depth buffer and area sub division method of visible surfaces.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions.

6. Explain Starbust method used for character generation.
7. Write the boundary fill algorithm with merits and demerits.
8. Consider a square with left bottom corner at (2,2) and right top corner at (6,6). Do the transformation which makes its size half while its' center remain same. Find the new vertices.
9. Explain DDA line drawing algorithm.
10. Derive the equation for reflection on $y = -x$.
11. Describe the logical classification of input devices.
12. State different input functions and input modes.
13. Explain the terms visible line and surface identification.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define refresh buffer/frame buffer.
 15. What is flood filling?
 16. What are the line attributes?
 17. What is window to view port transformation?
 18. Define polygon clipping.
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M.Sc. DEGREE EXAMINATION,
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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. State and explain different phases in Unified process.
2. Discuss how classes can be used for modeling the non-software things and modeling primitive types.
3. Explain common modeling techniques of sequence diagram.
4. Draw a class diagram, including minimum and maximum multiplicity for the following. The system stores information about two things: cars and owners. A car has attributes for make, model and year. The owner has attributes for name and address. Assume that a car must be owned by one owner and an owner can own many cars but that an owner might not own any cars (perhaps she just sold them all, but you still want a record of her in the system).
5. (a) What are components? Show the stereotypes that apply to components.
(b) Explain about Deployment diagram with an example.

SECTION B — (5 × 4 = 20 marks)

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

6. Describe Software development life cycle with a neat diagram.
7. Describe interfaces, types and roles with examples.
8. What are the actors? List the three kinds of actors.
9. What is meant by low coupling and high cohesion?
10. Discuss various uses of object diagram.
11. Write about common modeling techniques of events and signals.
12. Draw the interaction diagram for login use case in library application.

13. What is a design pattern? How are design patterns used in the design discipline?

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is visibility of an element owned by a package?
15. Distinguish between action state and activity state.
16. What is an event?
17. What is relationship? List the types of relationships.
18. Define domain modeling.
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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 Parallelism in Uniprocessor Systems.
2. Explain about the architecture of Star-100.
3. Explain about the MPP system architecture in detail.
4. Explain about different types of Parallel Algorithm.
5. Explain about the C.mmp Multiprocessor system architecture.

SECTION B — (5 × 4 = 20 marks)

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

6. Explain about the characteristics of cache memories.
7. Discuss about Data Buffering.
8. Explain about the pipeline chaining in Cray-I.
9. Explain Associative memory organization.
10. Explain about the Crossbar switch.
11. Discuss about the system deadlock problems.
12. Explain about the Operating System for IBM Multiprocessor.
13. Explain about the IBM 370 MP.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Explain about the memory hierarchy.
 15. What is Static Networks.
 16. What is multiport memory?
 17. What is Deadlock?
 18. What is Dataflow Computer?
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(DMCS24B)

M.Sc. DEGREE EXAMINATION,
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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 instruction formats with suitable examples.
2. Explain about 8086 data transfer and branch instructions with examples.
3. Explain about different types of I/O transfer with neat flow chart.
4. Explain about iRMX 86 memory management.
5. Explain about DMA transfer.

SECTION B — (5 × 4 = 20 marks)

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

6. Draw the timing diagram for memory read and memory write instruction and explain.
7. Explain about 8086 addressing modes.
8. Explain about different types of assembler directives with examples.
9. Explain about 8086 logical instructions.
10. Explain about relocation.
11. Explain about stack operations.
12. Explain about process states in iRMX 86.
13. Explain about common procedure sharing in iRMX 86.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is zero address instruction?
 15. Explain about the purpose of HLT instructions.
 16. What is a DMA transfer.
 17. What is demand paging.
 18. What is a semaphore.
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M.Sc. DEGREE EXAMINATION,
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CRYPTOGRAPHY AND NETWORK SECURITY

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

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

1. (a) What is the difference between passive and active security threats? List and briefly define categories of passive and active security attacks.

(b) Describe various substitution encryption techniques with example.
2. Discuss Diffie-Hillman key exchange algorithm in detail.
3. Write about HMAC algorithm. What need to be done to speed up HMAC algorithm?
4. Explain encryption and decryption in RSA algorithm and its limitations.
5. How encapsulating security payload help in IP security? Explain various fields in Encapsulating security payload packet.

SECTION B — (5 × 4 = 20 marks)

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

6. Draw the model for network security and explain each component of it.
7. Construct a playfair matrix with the key “moonmission” and encrypt the message “greet”.
8. Explain triple DES with two keys.
9. What are the different servers used in Kerberos? Explain the role of each one.
10. What are the properties of hashing functions?
11. Explain four passes of MD5 message digest algorithm.

12. Write the general format of PGP (Pretty Good Privacy) message.
13. What is a firewall? State different classification of firewalls.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define the terms confusion and diffusion.
 15. Define asymmetric key cryptography.
 16. What is Hill cipher?
 17. What are the web security threats?
 18. What is public-key cryptosystem?
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M.Sc. DEGREE EXAMINATION,
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TCP/IP

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions from the following.

1. Explain about TCP/IP protocol.
2. Explain about ARP protocol.
3. Describe Internet Group Management Protocol.
4. Explain about Unicast Routing protocols.
5. Explain about Domain Name System.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions from the following.

6. Explain about point-to-point WAN.
7. Explain about classless addressing.
8. Compare between static and dynamic routing.
9. Write about different types of messages in ICMP.
10. Explain about the uses of UDP protocol.
11. Explain about flow control in TCP.
12. What is multicasting? Explain different multicasting protocols.
13. Explain about Client-Server model.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is IP address?
15. What is a datagram?
16. Define TCP checksum.
17. What is NVT?
18. What is DDNS?

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DATA WAREHOUSING AND DATAMINING

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any **THREE** questions.

1. Explain about data warehouse design methodologies.
2. (a) What do you mean by data mart? What are the different types of data mart?
(b) Explain multi-dimensional data model for data warehouse with example.
3. Explain in detail about OLAP servers and also describe the methods to index OLAP data.
4. Explain different activities of ETL process and also mention ETL architecture.
5. What is data mining? Discuss various datamining tasks and applications.

SECTION B — (5 × 4 = 20 marks)

Answer any **FIVE** questions.

6. What is need of data warehouse and how to build it?

7. Write the Hub and Spoke data mart architecture with neat sketch.
8. Describe the contents of the metadata repository of a data warehouse.
9. Write a procedure to load oracle warehouse.
10. Write note on data warehouse indexing.
11. Explain Star and Fact Galaxy schemas used in data warehouse for multidimensional database.
12. Explain various OLAP operations on data cube with suitable example.
13. What are the reasons for presence of 'noise' in data collected for mining?
14. Write short notes on classification and clustering.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

15. Differentiate OLALP vs. OLTP.
16. Define data cube.
17. Define snapshot in data warehouse.
18. What is data transformation?

19. What is meant noised data?

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M.Sc. DEGREE EXAMINATION,
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EMBEDDED SYSTEMS

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

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

1. Explain about the typical components used in embedded system design. Explain about the following parameters :
 - (a) through put
 - (b) response
 - (c) testability and
 - (d) debuggability used in Embedded System.
2. Discuss about how disabling interrupts effects the system response and alternative to disabling interrupts to solve shared data problem.
3. Explain about Function Queue scheduling algorithm.
4. Explain about encapsulating semaphores and queues with suitable programs.
5. Explain about the principles required for the design of real-time embedded applications.

SECTION B — (5 × 4 = 20 marks)

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

6. Discuss about the Power and Decoupling.
7. Discuss about the timing Diagram for a D Flip-Flop.
8. Explain about the DMA.
9. Explain about UART.

10. Explain about Interrupt Routines in an RTOS Environment.
11. Discuss the Hard-real time scheduling considerations.
12. Explain the characteristics of assembly language.
13. Explain about Locator maps.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What is Tri-State outputs?
 15. What if two tasks with the same priority are ready?
 16. How does the microprocessor know where to find the interrupt routine when the interrupt occurs?
 17. Explain about mailboxes in RTOS.
 18. What is a Host Machine?
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(DMCS 27 B)

M.Sc. DEGREE EXAMINATION,
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IMAGE PROCESSING

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions.

1. (a) Explain about linear and nonlinear operations used in image processing.
(b) Describe fundamental steps in digital image processing.
2. Explain Spatial filtering in Image enhancement.
3. Explain about different image compression models with example.
4. Explain image smoothing using ideal low pass filters and Butterworth low pass filters.
5. Explain about edge linking and boundary detection process of segmentation.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions.

6. What are the elements of visual perception?
7. Briefly explain about image sensing and acquisition.
8. Write about grey level image transformation.
9. Explain the concept of histogram equalization.
10. With necessary equations, explain about Homomorphic filtering.
11. Write about image compression standard.
12. What is block transform coding? Explain.
13. Explain region based segmentation.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define neighbors of a pixel.
 15. Define the terms spatial redundancy.
 16. What is loss less image compression?
 17. Define sub band coding.
 18. Define segmentation.
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(DMCS 28 A)

M.Sc. DEGREE EXAMINATION,
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ARTIFICIAL INTELLIGENCE

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions.

1. (a) What is Tic-Tac-Toe problem? How do you say it is as a state space problem?
(b) Explain A* algorithm with example.
2. Explain Hill climbing technique with example. What are the limitations of hill climbing?
3. Discuss various approaches to representing knowledge.
4. Explain semantic nets, partitioned semantic nets and frame problems with example.
5. Discuss various phases for natural language processing.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions.

6. State any four problem characteristics.
7. Write about generate and test algorithm.
8. Write procedure to convert well-formed formula into clause form.
9. Explain forward versus backward reasoning with example.
10. Describe Augmented problem solver.
11. Write short notes on conceptual dependency graphs.
12. How to process English sentence by augmented transition network?
13. What is rule based expert system? Explain.

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. What Turing test?
 15. What is problems reduction?
 16. Define resolution.
 17. Define procedural knowledge.
 18. What is meant by ontology?
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M.Sc. DEGREE EXAMINATION,
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COMPILER DESIGN

Time : Three hours

Maximum : 70 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE questions.

1. Discuss various phases of compiler and trace on for the following arithmetic expression

$$a = b + c * 60.0 .$$

2. Consider the following grammar :

$$E \rightarrow E + T \mid T , T \rightarrow T * F \mid F , F \rightarrow (E) \mid a$$

- (a) Construct SLR parsing table for this grammar.
 - (b) Show the processing for the following expression using SLR parsing :
 $a * a + a .$
3. (a) Explain about various issues in type checking.
(b) Describe synthesized and inherited attributes.
 4. What is an activation record? When and why are those records used? List different fields of an activation records and state the purpose of those fields.
 5. Discuss various steps to perform loop optimization.

SECTION B — (5 × 4 = 20 marks)

Answer any FIVE questions.

6. What is role of input buffering in lexical analysis?
7. Describe compiler construction tools.

8. Compute FIRST and FOLLOW of the following grammar :
 $S \rightarrow A, A \rightarrow aB \mid Ad, B \rightarrow bBC \mid f, C \rightarrow g.$
9. Write a procedure to construct predictive parsing table.
10. Explain about syntax directed translation.
11. Describe different storage allocations strategies.
12. Describe the reaching definitions in data flow schemes.
13. Generate the code for the following expression :
 $x = (a + b) - ((c + d) - e).$

SECTION C — (5 × 1 = 5 marks)

Answer ALL questions.

14. Define regular expression.
 15. Define left factoring.
 16. Define loop unrolling.
 17. Define operator precedence grammar.
 18. What is meant by abstract syntax tree?
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