

M. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Final Year)

COMPUTER SCIENCE

Paper - I : Advanced Database Management Systems

Time : 3 Hours

Maximum Marks : 75

Answer question No. 1 is compulsory

(15)

Answer ONE question from each unit

(4 x 15 = 60)

- I)**
- a) What is an object?
 - b) What primary characteristics should an OID possess?
 - c) Define reliability.
 - d) Define inheritance.
 - e) List the characteristics of an object.
 - f) List the aggregate operators in OQL.
 - g) Write the syntax for group by clause in OQL.
 - h) Define distributed database.
 - i) What is fragmentation transparency?
 - j) What is vertical fragmentation?
 - k) List any three characteristics of Query Processor.
 - l) What are the layers of query processing?
 - m) What is query optimization?

- n) List the methods used for deadlock avoidance.
- o) What is fault tolerance?

Unit - I

- 2) a) Discuss various type constructors. How are they used to create complex object structures?
- b) Explain polymorphism with an example.

OR

- 3) Write short notes on :
 - a) Object definition language (ODL).
 - b) Object query language (OQL).

Unit – II

- 4) a) Discuss in detail about the problem areas in DDBS environment.
- b) What are the components of distributed DBMS?

OR

- 5) a) What is horizontal fragmentation? Explain with example.
- b) Explain views in centralized DBMS with example.

Unit – III

- 6) a) Give an example of reduction for vertical fragmentation.
- b) What are the objectives of query processing?

OR

- 7) a) What do you mean by normalization? Explain with example.
- b) State and explain R* algorithm.

Unit – IV

- 8) Explain time stamp based concurrency control algorithms.

OR

- 9) a) Explain properties of transaction.
- b) Explain 2Phase commit protocol.

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Answer Question No.1 is compulsory

(15)

Answer one questions from each unit

(4×15 = 60)

- 1) a) What is time and space complexity?
- b) What is asymptotic notation? Why we need it in algorithms?
- c) Define dynamic programming.
- d) What is traversal techniques?
- e) Differentiate NP-hard and NP-complete problems.

UNIT - I

- 2) a) Explain Theta notation. Explain the terms involved in it. Give an example.
- b) Show that $f(n) + g(n) = O(n^2)$, where $f(n) = 3n^2 - n + 4$ and $g(n) = n \log n + 5$.

OR

- 3) a) Describe the performance analysis in detail.
- b) Write and explain the control abstraction for Divide and Conquer.

UNIT - II

- 4) a) Differentiate between Divide & Conquer and Greedy method.
- b) Write Prim's algorithm and also analyze its time complexity.

OR

- 5) Write pseudo code of the dynamic programming problem for solving optimal binary search tree and also determine it's time and space complexities.

UNIT - III

- 6) a) Explain the properties of search techniques(DFS).
b) Write a non-recursive algorithm for post order traversal of a tree and analyze it's time complexity.

OR

- 7) Write the control abstraction of backtracking, also write backtracking algorithm for 8-queens problem

UNIT - IV

- 8) a) Explain the classes of P and NP-problems.
b) Explain the nondeterministic Knapsack problem.

OR

- 9) a) Explain about cook's theorem.
b) Explain the strategy that to prove that a problem is NP-hard



M.Tech. DEGREE EXAMINATION, MAY – 2015

Final Year

COMPUTER SCIENCE

Paper - III : Computer Networks

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one questions from each unit

(4×15 = 60)

- 1) a) List all reference models.
- b) What are multiple access problems?
- c) What is the difference between internet and intranet?
- d) What is data link layer switching.
- e) Define QoS in N/W layer.
- f) Define cryptography.
- g) What is significance of E-mail security?

UNIT - I

- 2) a) Compare and contrast WAN and internet.
- b) With suitable examples compare point-to-point channels and broadcast channels.

OR

- 3) a) Discuss error detection and error correction.
- b) What are the various types of network topology? What are the implications having different topologies.

UNIT - II

4) Discuss congestion control algorithms.

OR

5) a) Compare the five different types of cabling (Ethernet).

b) Explain internet working.

UNIT - III

6) a) What are simple transport protocols? Why these are important.

b) UDP provides only connectionless service, why? How you provide reliability?

OR

7) DNS uses databases. Database can be centralized and distributed. What are the pros and cons of centralized and distributed data base approaches? What type of data base DNS actually uses.

UNIT - IV

8) Differentiate between e-mail security and web security.

OR

9) Discuss various public key algorithms.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Second Year

COMPUTER SCIENCE

Paper - IV : Internet Programming

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one questions from each unit

(15×4 = 60)

- 1) a) What is Flowchart?
- b) Define Absolute positioning.
- c) What is the use of CSS?
- d) List any 5 Data binding events of DHTML along with their description.
- e) What is the EOF and BOF properties.
- f) Compare any 5 Javascript control structures with equivalent VBScript control structures.
- g) What is HTTP daemon.

UNIT - I

- 2) Write about usage of objects in Javascript.

OR

- 3) Explain Recursion with Fibonacci series generation.

UNIT - II

- 4) Explain about Object model and Collections with relevant examples.

OR

- 5) Write a short note on CSS.

UNIT - III

6) With an example, explain scaling shape transformation.

OR

7) Explain Path controls in DHTML.

UNIT - IV

8) Write a short note on File System Objects in ASP.

OR

9) Explain the DTD and the Microsoft scheme.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Final Year

COMPUTER SCIENCE

Paper - V : Real Time Systems

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one questions from each unit

(4×15 = 60)

- 1) a) What is Real Time protocol.
- b) Differentiate Periodic messages with Aperiodic Messages.
- c) What is Self Suspension? Mention the cause for it.
- d) What are Multirate systems.
- e) What is Periodic Threads.
- f) What are processors and resources.
- g) What are Passive Resources.

UNIT - I

- 2) a) Discuss about Optimality & Non-optimality of LST algorithms.
- b) Explain the scheduling hierarchy of Real Time Systems.

OR

- 3) a) Explain Radar signal processing system.
- b) Define the tardiness of the job. How it affects the soft and hard real time jobs.

UNIT - II

- 4) a) With an example, explain about Time-driven scheduling of Real time Jobs.
- b) Discuss the Pros and Cons of Clock-driven scheduling.

OR

- 5) a) Explain the schedulable utilizations of the EDF algorithms.
- b) Draw a network-flow graph that we can use to find a preemptive cyclic schedule of the periodic tasks $T_1 = (3,1,7)$, $T_2 = (4,1)$, $T_3 = (6,2,4,8)$.

UNIT - III

- 6) a) Explain Release Guard protocol and Greedy Synchronization Protocols.
- b) Explain basic priority-ceiling protocol and differentiate it with priority inheritance protocol.

OR

- 7) a) Discuss about the various effects of Resource Contention and Resource Access Control.
- b) Summarize on the algorithms involved in tasks assignment in multiprocessor scheduling.

UNIT - IV

- 8) a) List the capabilities of commercial Real Time Operating Systems.
- b) Explain the communication in Multicomputer Systems.

OR

- 9) a) Explain briefly about different Time services in Real Time Operating Systems.
- b) Write a short note on Weight Fair-Queueing Discipline for Switched Networks.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Second Year

COMPUTER SCIENCE

Paper - VI : Artificial Intelligence

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one question from each unit

(4×15 = 60)

- 1) a) What do you mean by state space search?
- b) Define AI.
- c) List all problem characteristics.
- d) Name the Heuristic search techniques.
- e) State the logic and predicate.
- f) What is the difference between fact and instance?
- g) Define script.
- h) How to represent an instance?
- i) List the string operations.
- j) What is a logic programming?
- k) List out the Arithmetic operations.
- l) Define a fact.
- m) Define cut.
- n) What is the significance of means.
- o) What is a conflict resolution?

UNIT - I

- 2) a) Write an algorithm to perform BFS of a graph.
- b) For each of the following problems, describe a good heuristic function:
- i) Blocks world
 - ii) Theorem proving.

OR

- 3) Trace the constraint satisfaction crypt arithmetic procedure by solving the following problem:

CROSS
+ROADS
=DANGER.

UNIT - II

- 4) a) Explain different approaches to knowledge Representation.
- b) What is Inheritable Knowledge? Explain.

OR

- 5) a) What is Means-ends Analysis? Explain Hill Climbing Algorithm with an example.
- b) Explain the unification algorithm.

UNIT - III

- 6) a) Distinguish between procedural versus declarative knowledge.
- b) What is control knowledge? Explain with an example.

OR

- 7) a) Define conflict resolution. Explain with an example.
- b) What is Forward chaining rule system? Explain.

UNIT - IV

- 8) Explain the following:
- a) Facts,
 - b) Objects, and
 - c) Predicates.

OR

- 9) Discuss dynamic databases.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Final Year

COMPUTER SCIENCE

Paper - VII : Object Oriented Analysis and Design

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one question from each unit

(4×15 = 60)

- 1) a) What is a model.
- b) List out common modeling techniques.
- c) Define an object.
- d) What do you mean by relationship?
- e) What is an instance.
- f) State Four P's.
- g) Define time and space.

UNIT - I

- 2) a) Enumerate any eight application domains of UML.
- b) Why is UML used? Explain with UML notation the various relationships in UML.

OR

- 3) a) State the principles of modeling with examples.
- b) What is an object? List out the various object diagrams.

UNIT - II

- 4) a) What is a use case diagram? Why we need them? Illustrate.
- b) Define state chart diagram. Discuss the importance.

OR

- 5) a) Differentiate between the processes and threads.
b) What are the characteristics of a well-structured model with time and space properties?

UNIT - III

- 6) a) Enumerate the procedure in activity diagram.
b) What do you mean by state machine? Why do we need them.

OR

- 7) a) Why we need Four P's in unified process?
b) Discuss a use-case driven process.

UNIT - IV

- 8) Explain the design and test in life cycle.

OR

- 9) a) What is a design? What the importance of design in UML?
b) Define a test. Why we need it in analysis?



M.Tech. DEGREE EXAMINATION, MAY – 2015

Final Year

COMPUTER SCIENCE

Paper - VIII : Embedded Systems (Elective –I)

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one questions from each unit

(4×15 = 60)

- 1) a) What is a embedded system? Give an example.
- b) What do you mean by operating system.
- c) List all system services of OS.
- d) Give examples of Embedded S/W development tools.
- e) State the real time applications of embedded systems.
- f) Define Task.
- g) What is a Interrupt? Give an example.

UNIT - I

- 2) a) What is the importance of Embedded Systems in the present world? Give reasons.
- b) Give reasons why hardware fundamentals are important in embedded systems? List out all advanced hardware requirements.

OR

- 3) a) What is interrupt? Discuss.
- b) What is soft real time OS? Give examples.

UNIT - II

- 4) a) What is shared data? Discuss all shared data problems in Embedded Systems. Give an example.
- b) Why software requirements are important in Embedded Systems? Give reasons.

OR

- 5) a) What is real time OS. Give reasons and examples why these are important.
- b) State all important applications of real time OS.

UNIT - III

- 6) What is OS service? Explain with suitable examples.

OR

- 7) Discuss and give examples about the basic design of Real-time OS.

UNIT - IV

- 8) Explain two Embedded development tools.

OR

- 9) What is debugging? Why we need to perform? State and explain two techniques.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Second Year

COMPUTER SCIENCE

Paper - VIII : Image Processing (Elective – I)

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one question from each unit

(4×15 = 60)

- 1) a) What is digital image representation?
- b) What is photographic film?
- c) Define image smoothing?
- d) What is low pass filtering?
- e) What do you mean by density slicing?
- f) What are color fundamentals in image processing?
- g) What is edge detection?

UNIT - I

- 2) a) Explain digital image processing systems.
- b) Explain the camera model.

OR

- 3) a) What is image model? Write the differences between non-uniform sampling and quantization.
- b) What is a pixel? Why we need it in image processing?

UNIT - II

- 4) a) State properties of the 2D-fourier transform.
b) Discuss Walsh and Hough image transform?

OR

- 5) a) Write a short note on spatial domain method.
b) What is image smoothing? Explain neighbourhood averaging median filtering.

UNIT - III

- 6) a) Explain the steps involved in the degradation model.
b) What do you mean by discrete formulations? Explain.

OR

- 7) Discuss degradation model for continuous functions.

UNIT - IV

- 8) a) What is image encoding? Discuss the Fidelity criteria.
b) Explain point detection.

OR

- 9) a) How to detect the edge linking and boundary detection thresholding?
b) Explain the edge detection.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Final Year

COMPUTER SCIENCE

Paper - IX : Mobile Cellular Communication (Elective – II)

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer one question from each unit

(4×15 = 60)

- 1) a) Distinguish between the permanent splitting and dynamic splitting.
- b) Define the term “Roaming” and “Handoff”.
- c) What is near/far effect in wireless networks?
- d) List the non-fixed channel assignment algorithms.
- e) Distinguish between HLR and VLR functionalities in GSM architecture.
- f) What is the intelligent cell?
- g) List the characteristics of Advanced intelligent networks.

UNIT - I

- 2) a) Draw the schematic and the present the working of a cellular system?
- b) Briefly explain the evaluation of the analog and digital cellular mobile system?

OR

- 3) a) Derive the maximum number calls per hour per cell and the maximum number frequency channels per cell. How are they related?
- b) Find the desire co channel interference phenomena in a reuse cellular system that employs omni directional antenna system?

UNIT - II

- 4) a) Explain in detail access channels and operational techniques.
b) Explain in detail about grouping of Set-up channels.

OR

- 5) a) What are the two decision making parameters of handoff explain.
b) Write about cell site handoff only scheme.

UNIT - III

- 6) a) What are the considerations for digital voice transmission in cellular mobile systems.
b) Write a short notes on DECT.

OR

- 7) Explain in detail about GSM architecture.

UNIT - IV

- 8) a) What are the applications of Intelligent microcell systems.
b) Explain the advantages of implementing intelligent cells.

OR

- 9) Write a short notes on
a) Future land mobile telecommunication systems.
b) Wireless information super highway.



M.Tech. DEGREE EXAMINATION, MAY – 2015

Second Year

COMPUTER SCIENCE

Paper - IX : Network Security (Elective – II)

Time : 3 Hours

Maximum Marks: 75

Answer Question No.1 is compulsory

(15)

Answer any one questions from each unit

(15×4 = 60)

- 1) a) Define Internet Security.
- b) What do you mean by security mechanisms?
- c) What is a decryption.
- d) Why do we need access control?
- e) How many requirements are there for symmetric encryption?
- f) State applications of public key encryption.
- g) Why we need to perform hashing in cryptography algorithms?
- h) What is the significance of R64?
- i) Why RFC codes are used in Kerberos?
- j) List out the differences between authentication and hashing.
- k) State two discrete logarithmic algorithms.
- l) What is the optional feature of ESP?
- m) What is a Tunneling?

- n) Define Cookie.
- o) Give application of IPSec.

UNIT - I

- 2) a) Define security attack. Explain in detail about the various security attacks an Internet work is vulnerable to.
- b) Write about Man-in-middle attack.

OR

- 3) a) Differentiate between symmetric block and stream ciphers.
- b) Write about key distribution.

UNIT - II

- 4) a) Perform RSA algorithm on the given data and explain how encryption and decryption are performed on the message: $p = 7$; $q = 11$, $e = 17$, $M = 8$.
- b) What is Euler's totient? State and prove Euler's theorem.

OR

- 5) Explain RSA with discrete logarithms.

UNIT - III

- 6) a) In what order should the signature function and confidentiality function be applied?
- b) What are the some threats associated with a direct digital signature scheme?

OR

- 7) Explain secure hash algorithms.

UNIT - IV

- 8) a) Explain R64 conversion an example.
- b) Why is R64 conversion for an e-mail application.
- c) Why is the segmentation and reassembly function in PGP needed?

OR

- 9) Write short notes on:

- a) Fire walls.
- b) Trusted systems.

