ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc. (Computer Science) II Semester
MCS2.1: Formal Languages & Automata Theory

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1) a. Discuss the equivalence between DFA & NFA with Examples 7M
b. Write NFA Equivalent to the Regular Expression (0+1)*111 8M
Or
c. Explain with an example, closure properties of Regular sets 7M
d. Explain Minimization of Finite Automata. With an example 8M

2) a. What is CFG ? Give an unambiguous grammar for L= {w/w $\in${a,b}+} 7M
b. Convert the following Grammar into CNF
S → ABA ; A→aA/ϵ ; B→ bB/ϵ 8M
Or
c. State and Prove pumping Lemma for Context Free Language 8M
d. Discuss the Decision Algorithm for CFL 7M

3) a. Design a Turing Machine to accepting all strings $o^n 1^n 2^n$ 8M
b. Explain variants of Turing Machines with examples. 7M
Or
c. Explain about Universal Turing Machine 7M
d. Discuss Halting Problem of Turing Machine 8M

4) a. What are the different types of Grammars and Briefly discuss each one with example? 15M
Or
b. Explain Context Sensitive Languages 7M
c. Discuss relationship between classes of Languages 8M

5) Answer any Five of the following 5 X 3M =15M
a) Define DFA & NFA with examples
b) What is the Finite Automata? Write a Finite Automata accepting all the strings having no consecutive zeros & consecutive ones.
c) State Pumping lemma for regular sets.
d) What is GNF? Give an example
e) What is derivation tree? Give an example
f) Define Turing Machine? Give an example
g) What is Push Down Automata? Give an example
h) Ambiguous Grammars

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ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.2: Relational Data Base Management Systems

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1) a. Consider the following database and answer the following queries in SQL.
Sailors(**sid**, sname, rating, age) Boats(**bid**, bname, color) Reserves(**sid, bid, day**)
I. Find the sid and sname of sailors who have reserved a boat on 10-jun-2000. 3M
II. Find the average age for each rating level. 2M
III. Find the sid and sname of sailors who have reserved all boats. 4M
IV. Find the sids of sailors who have reserved two different boats on the same day. 3M
V. Find the sids of sailors who have reserved both Red and Green boats. 3M

Or

b) Explain how relational algebra concepts are used in DBMS 15M

2) a. Explain with an example, closure of set of FDs and closure of set of attributes. 15M

Or

b. Explain normalization up to BCNF. 15M

3) a. Explain the way of performing selection using file scan and indices. 8M
b. Explain about centralized and client server architectures. 7M

Or

c. Explain the concepts of Parallel and Distributed Databases 15M

4) a. Explain Two phase locking protocol . 8M
b. Explain multi version Time stamp ordering Concurrency control. 7M

Or

c. Discuss DBMS principles, concepts and applications with respect to MS SQL Server 15M

5) Answer any Five of the following 5 X 3M =15M
a) Differentiate between inner join and outer join.
b) ACID properties of transaction.
c) Triggers?
d) Explain about stored procedures.
e) Explain about parsing and translation of a query.
f) Phases of ARIES recovery algorithm
g) What are read and write stamps associated with database objects?
h) What are various categories of Postgre SQL types?

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ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.3:Advanced Operating Systems

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1.	a)	Explain about Operating System Structures	(8M)
	b)	Explain Operating System Design and Implementation	(7M)
		Or	
	c)	Explain Inter Process Communication	(7M)
	d)	Explain various process scheduling algorithms	(8M)
2.	a)	Explain about Critical Section Problem	(7M)
	b)	Explain various methods for handling Deadlock	(8M)
		Or	
	c)	What is virtual Memory? Explain with example	(7M)
	d)	Explain various page replacement algorithms	(8M)
3.	a)	Explain various goals of Distributed systems.	(7M)
	b)	Explain Architecture of Distributed Systems	(8M)
		Or	
	c)	Explain the concept of Clock Synchronization	(7M)
	b)	Explain various consistency Models	(8M)
4.	a)	What is fault tolerance and how to rectify the fault tolerance	(8M)
	b)	Explain Android Operating system	(7M)

5. Answer any Five of the following — 5 X 3M = 15M
   a) Thread scheduling
   b) Types of Operating System
   c) Semaphores
   d) Critical region
   e) Virtual Memory
   f) Job Scheduling
   g) Mutual Exclusion
   h) Thrashing

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ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc. (Computer Science) II Semester
MCS2.4: Elective I : Data Warehousing & Data Mining
Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. (a) What is data mining? Briefly describe the components of a data mining system. 7M
   (b) What are the major issues in Data Mining? Briefly describe important Applications of Data mining 8M

   Or

   (c) Explain Data Modeling using Cubes and OLAP 15M

2. (a) Explain Primitives and tasks of Data mining 8M
   (b) Explain various Data Cube Computation Methods 7M

   Or

   (c) Discuss in detail about the Data Preprocessing Techniques 8M
   (d) Explain data Generalization and Summarization concepts in Data Mining 7M

3. (a) Explain 15M
      i) FP Growth Algorithm
      ii) Apriori Algorithm

   Or

   (b) Discuss about Back propagation algorithm for neural network-based classification of data. 8M
   (c) Explain the Concept of SVM and Algorithm for classification of linear and non-linear data 7M

4. (a) Write about different types data in cluster analysis. Explain briefly Density based Clustering Method 7M
   (b) Discuss in detail about Evaluation of Clustering solutions 8M

   Or

   (c) Explain the concepts in Semantic Web Mining and Ontology 7M
   (d) Explain various agents in Web data mining 8M

5. Answer any Five of the following 5 X 3M = 15M
   (a) Discretization
   (b) Advantages of ROLAP and MOLAP
   (c) Ice-berg query.
   (d) Constraint –based rule mining
   (e) Cross table reporting
   (f) Slicing operations
   (g) Components of five-number summary
   (h) GUI based DMQL

ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.4: Elective I : Image Processing

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. a. How do you Acquire an image? Explain in detail. 8M
   b. Define and explain image sliding and image stretching. 7M

   Or

   c. Give an Algorithm for FFT 7M
   d. Give an Algorithm for WFT 8M

2. a. Define and explain low pass filters in brief. 7M
   b. Define and edge. Explain various edge enhancement filters. 8M

   Or

   c. Define prewitt filter. 7M
   d. Explain in detail Color Image Processing. 8M

3. a. Explain design of High and Low Pass Filters 7M
   b. Explain Homomorphic Filters 8M

   Or

   c. Explain compression at the time of Image Transmission. 7M
   d. Explain about standardization in image compression. 8M

4. a. Explain split and merge technique for segmentation. 7M
   b. Define and explain thresholding. 8M

   Or

   c. Explain various applications of Morphology in Image Processing 8M
   d. Explain Multi-scale and multi orientation representation 7M

5. Answer any FIVE of the Following 5 X 3M = 15M
   a) What do you mean by Image geometry
   b) Define sampling.
   c) Define Walsh transform.
   d) What do you mean by colour Image Processing
   e) What are the Image Compression Standards
   f) How do you represent an image in frequency domain?
   g) Skeletanization
   h) Erosion and Dilation of Images

ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.4: Elective I : Bio-Informatics
Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. (a) Explain how Pattern Recognition can be viewed as a Prediction problem. 7M
   (b) Define Sequence Analysis, Homology and Analogy. 8M

   Or

   (c) Define Biological Protein Information Databases. What is a Primary Sequence Database 7M
   (d) What is a Protein Pattern Database? Elaborate on Structure Classification Databases. 8M

2. (a) Explain the functioning of DNA Sequence Databases. 7M
   (b) Write all the Specialized Genomic Information Resources existing. 8M

   Or

   (c) Write the importance of DNA Sequence Analysis. Give a brief account of Gene Structure and DNA Sequences. 8M
   (b) What are the features of DNA Sequence Analysis? What are the effects of EST Data on DNA Databases 7M

3. (a) What are the algorithms for Pair Wise Alignment Techniques for comparing Two Sequences. 8M
   (b) What are the different Alignment Techniques? What is importance of Dynamic Programming in Pair Wise Alignment Technique? 7M

   Or

   (c) What are the Progressive Methods for Multiple Sequence Alignment. 8M
   (d) Elaborate on Databases of Multiple Alignments and Searching. 7M

4. (a) Explain importance and need of secondary database 8M
   (b) How to build a sequence search protocol 7M

   Or

   (c) Explain commercial database package 7M
   (d) Explain packages specializing in DNA Analysis 8M

5. Answer any FIVE of the following: 5 X 3M =15M

(a) Sequencing
(b) Biological Sequence/Structure
(c) Genome Projects
(d) The Dotplot
(e) Sequence Search Protocol
(f) DNA Sequence Analysis
(g) Pair Wise Alignment.
(h) Structure of Analysis Packages

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ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.4: Elective I : Computer Graphics

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. a. Explain overview of Graphics System 7M
   b. What are the differences between the raster scan and random scan devices? 8M

   Or

   c. Describe the Bresenham's circle drawing algorithm. 8M
   d. Explain how the Bresenham's line drawing algorithm works for the line joining the points (–1, 2) and (7, 5). 7M

2. a. Describe the matrix forms of the two dimensional transformations of translation, rotation and scaling. 8M
   b. Derive the transformation matrix for finding the reflection of a point with respect to the line y = mx + c. 7M

   Or

   c. Describe Cohen - Sutherland algorithm for line clipping. 8M
   d. Explain how the Sutherland - Hodgaman algorithm for polygon clipping. 7M

3. a. Explain Projections with example 7M
   b. Describe the 3D transformations for rotation, scaling and translation 8M

   Or

   c. Explain Line clipping and Polygon Clipping 15M

4. a. Explain computational and mathematical methods for crating , capturing and analyzing and manipulating digital photographs 15M

   Or

   b. Explain linear and nonlinear filtering 15M

5. Answer any Five of the following: 5 x 3M =15M
   a) Frame Buffer
   b) Homogeneous Coordinates
   c) Graphics Work stations
   d) GUI?
   e) Antialiasing.
   f) View port
   g) GPS Based Automobile Navigation System
   h) Blending functions of B-Spline curves?

ADIKAVI NANNAYA UNIVERSITY :: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science) II Semester
MCS2.5 Elective II : Web Technologies

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. a) Explain about Basic Structure of HTML Document (7M)
   b) Explain Tables & Layouts IN HTML (8M)
   Or
   c) Write A program to illustrate Dynamic HTML with Java Script (15M)

2. a) Explain about Document Object Model with Example (8M)
   b) Explain with an example presenting XML document (7M)
   Or
   c) Explain briefly about different types of JDBC drivers (8M)
   d) Write a Program to illustrate JDBC Database Connection (7M)

3. a) Explain with an example selecting, inserting and deleting data from tables (7M)
   b) Write a program to join Two Tables in JDBC. (8M)
   Or
   c) Explain about Servlet basics (7M)
   d) Explain how to configure Apache Tomcat Server (8M)

4. a) what is JSP and Explain benefits of JSP (7M)
   b) Write a program to include Files in JSP pages (8M)
   Or
   c) Explain JAVA Beans with example (8M)
   d) Explain MVC Architecture (7M)

5. Answer any Five of the following: 5 X 3 = 15M
   a) Cascading Style sheets
   b) HTML Frames
   c) Statement objects
   d) Sub Queries
   e) Cookies
   f) Basic Syntax of JSP
   g) Java Beans
   h) Session tracking

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ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM
I Year M.Sc.(Computer Science)II Semester
MCS2.5Elective II : Mobile Computing

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. (a) What is Three-Tier Architecture for Mobile Computing. Explain 7M.
   (b) Give a brief account of Mobile Devises and Mobile-Enabled Applications. 8M
   Or
   (c) Explain various generations in Wireless Networks. 8M
   (d) Write all the approaches for Traffic Routing in Wireless Networks. 7M

2. (a) Explain WLAN Standard IEEE 802.11 in detail. 8M
   (b) Compare IEEE 802.11a, B, G and N Standards. 7M
   Or
   (c)Differentiate between Bluetooth and Radio Frequency Identification (RFID). 7M
   (d) Differentiate GSM and GPS. 8M

3. (a) How data is replicated for Mobile Computers. 8M
   (b) Explain Data Services in GPRS and applications for GPRS. 7M
   Or
   (c) Explain Push-Based and Pull-Based Mechanisms. 7M
   (d) What is a 3G Network. Write its Applications. 8M

4. (a) Explain Wireless Application Protocol and various layer 15M
   Or
   (b) What is SMS and explain various value added services through SMA 15M

5, Answer any Five of the Following 5 X 3M = 15M
   (a) Ubiquitous Network
   (b) Fixed Network Transmission Hierarchy
   (c) Cellular Networks.
   (d) Wireless PANs
   (e) Java Card
   (f) CDMA
   (g) GSM
   (h) WiMAX

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I Year M.Sc.(Computer Science)II Semester
MCS2.5Elective II : Wireless Sensor Networks

Model Question Paper

Time: 3 Hrs. **Max. Marks: 75**

SECTION – A
Answer ALL Questions (4 X 15 = 60)

1. (a) Explain about challenges for Wireless Sensor Networks. 8M
   (b) Explain about the Design principles for Wireless Sensor Networks. 7M
   Or
   (c) Explain energy consumption of Sensor Networks 8M
   (d) Explain merits and demerits of Sensor Networks 7M

2. (a) Explain about Contention-based protocols. 8M
   (b) Explain about Schedule – based protocols. 7M
   Or
   (c) Explain about framing. 8M
   (d) Explain about Link Management. 7M

3. (a) Explain about Content-based and geographic addressing. 15M
   Or
   (b) Explain about Energy efficient unicast routing. 8M
   (c) Explain about Geographic Routing. 7M

4. (a) Explain about Data centric storage 8M
   (b) Explain about Data Aggregation 7M
   Or
   (c) Explain QoS in Wireless Sensor Networks 8M
   (d) Explain Control and Rate Control 7M

5. Answer any Five of the following 5 X 3M =15M

   (a) Write about applications of Sensor networks
   (b) Write about optimization goals of WSN
   (c)Write about Blue tooth
   (d)What is framing
   (e)Name management in WSN
   (f)write about routing in WSN
   (g)Write about Hardware Components of WSN
   (h) Block Delivery

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