

[M16CST1101]

I/II M.Tech. I Semester Regular Examinations

MODEL QUESTION PAPER

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

(Common for M.Tech(CST,IT))

Time: 3 Hours

Max. Marks: 70

First Question is compulsory

Answer any FOUR from the remaining questions.

Write all parts of any question at one place.

1. Briefly explain the following: 7 X 2 = 14M
  - a) Define an alphabet and string.
  - b) Define Grammar and Language.
  - c) Define a Graph.
  - d) What is meant by primitive recursive function.
  - e) Define a Computable Function.
  - f) Explain about Post Correspondence Problem .
  - g) Explain about Finite Automata with example
  
2.
  - a) Explain the Statements and applications of Euler and Fermat Theorems (7M)
  - b) Define Elliptic Curves and their applications to Cryptography (7M)
  
3.
  - a) Define DFA and NFA with Examples. Differentiate them. (7M)
  - b) Design a DFA which accepts Even number of 0's and 1's. (7M)
  
4. State and Prove Equivalence of NFA and DFA (14M)
  
5.
  - a) Define CFG with Example. (4M)
  - b) Convert the following Grammar into GNF (10M)  
 $G = (\{A_1, A_2, A_3\}, \{a, b\}, P, A_1)$  where P contains following productions.  
 $A_1 \rightarrow A_2 A_3$   
 $A_2 \rightarrow A_3 A_1 / b$   
 $A_3 \rightarrow A_1 A_2 / a$
  
6.
  - a) Show that the language  $L = \{a^n b^n c^n / n \geq 1\}$  is not CFL. (7M)
  - b) Design a PDA for the Language  $L = \{WW^R / W \in (a,b)^*\}$  (7M)
  
7.
  - a) Define Turing Machine with example (7M)
  - b) Design a Turing Machine for proper subtraction  $m - n$  is defined to be  $m - n$  for  $m \geq n$  and **Zero** for  $m < n$ . (7M)
  
8. Write short notes on
  - a) Types of Turing Machines (6M)
  - b) Decidable and Undecidable problems (5M)
  - c) Halting Problem. (5M)

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**[M16CST1102]**  
I/II M.Tech. I Semester Regular Examinations  
MODEL QUESTION PAPER  
**DATA STRUCTURES AND ALGORITHMS**  
**(Common for M.Tech(CST,IT))**

Time: 3 Hours

Max. Marks: 70

First Question is compulsory  
Answer any FOUR from the remaining questions.  
Write all parts of any question at one place.

1. Briefly explain the following: 7 X 2 = 14M
  - a) explicit Constructor
  - b) Application of queues.
  - c) Time complexity
  - d) NP-completeness
  - e) External Sorting algorithms.
  - f) Equivalence relation
  - g) Splay Trees
  
2.
  - a) Explain about the Parameter Passing in C++. (7M)
  - b) Define Templates. Explain about different types of templates (7M)
  
3.
  - a) Write a C++ routine to convert Infix to Postfix expression. (7M)
  - b) Explain about the ADT of circular Linked Lists. (7M)
  
4.
  - a) Write a 'C++' routine for removal of a node from a Binary Search Tree (7M)
  - b) Construct an AVL Tree with following data: 10 15 9 12 13 79 45 36 22 (7M)
  
5.
  - a) What is Hashing? Explain about the Open Addressing in hashing. (9M)
  - b) Explain about the Extendible hashing. (5M)
  
6.
  - a) Write a 'C++' routine for Quick Sort Algorithm (7M)
  - b) Trace the following with Merge Sort algorithm. (7M)  
23 41 71 13 9 27 82 143
  
7.
  - a) Explain about the All-Pairs shortest path algorithm for given graph (7M)
  - b) Derive an algorithm to find minimum cost Spanning Tree. (7M)
  
8. Write short notes on
  - a) Path Compression (4M)
  - b) Union-by-Rank algorithm analysis (6M)
  - c) Application of Depth-First Search. (4M)

**[M16CST1102]**

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[M16CST1103]

I/II M.Tech. I Semester Regular Examinations

MODEL QUESTION PAPER

ADVANCED DATABASE MANAGEMENT SYSTEMS

(Common for M.Tech(CST,IT))

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and all questions carry equal marks

Answer all parts of any Question at one place.

- 1) Briefly explain the following: 7X2M=14M
- a) Differentiate between inner join and outer join.
  - b) What is normal form? What is normalization?
  - c) Explain about stored procedures.
  - d) Explain about parsing and translation of a query.
  - e) What is a distributed database system?
  - f) What are read and write stamps associated with database objects?
  - g) What are various categories of Postgre SQL types?
- 2) Consider the following database and answer the following queries in SQL.  
Sailors(sid,sname,rating,age) Boats(bid,bname,color) Reserves(sid,bid,day)
- a) Find the sid and sname of sailors who have reserved a boat on 10-jun-2000. 2M.
  - b) Find the average age for each rating level. 2M.
  - c) Find the sid and sname of sailors who have reserved all boats. 4M.
  - d) Find the sids of sailors who have reserved two different boats on the same day. 3M.
  - e) Find the sids of sailors who have reserved both Red and Green boats. 3M.
- 3) a) Explain with an example, closure of set of FDs and closure of set of attributes. 5M.  
b) Explain normalization upto BCNF. 9M.
- 4) a) Explain granting and revoking of various authorizations to users with examples. 6M.  
b) Explain various statements and cursors in embedded SQL. 8M.
- 5) a) Explain the way of performing selection using file scan and indices. 7M.  
b) Explain various equivalence rules on relational algebra expressions. 7M.
- 6) a) Explain about centralized and client server architectures. 7M.  
b) Explain about structured types and type inheritance in SQL. 7M.
- 7) a) Explain Two phase locking protocol . 7M.  
b) Explain multi version Time stamp ordering Concurrency control. 7M.
- 8) Write short notes on the following
- a) ACID properties of transaction. 4M.
  - b) Triggers. 4M.
  - c) Phases of ARIES recovery algorithm. 6M.

[M16CST1103]

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**[M16CST1104]**

I/II M.Tech. I Semester Regular Examinations  
MODEL QUESTION PAPER  
**ADVANCED OPERATING SYSTEMS**  
(Common for M.Tech(CST,IT))

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and all questions carry equal marks

Answer all parts of any Question at one place.

1. Briefly explain the following: 7 X 2 = 14M
  - a) Types of Operating System
  - b) Semaphores
  - c) Critical region
  - d) Virtual Memory
  - e) Scalability
  - f) Mutual Exclusion
  - g) Fault Tolerance
  
2.
  - a) Explain about Operating System Structures (7M)
  - b) Explain Operating System Design and Implementation (7M)
  
3.
  - a) Explain about Critical Section Problem (7M)
  - b) Define Types of Threads in Detail (7M)
  
4. Explain Scheduling Algorithms. (14M)
  
5.
  - a) Explain Methods for Deadlock Handling (7M)
  - b) Explain Deadlock Detection and Recovery methods (7M)
  
6.
  - a) Explain Page Replacement Algorithms (7M)
  - b) Explain Communication in Distributed System (7M)
  
7.
  - a) Explain Architecture VS Middleware in Distributed System (7M)
  - b) Explain Centralized and Decentralized Algorithms in Distributed system (7M)
  
8. Write Short on
  - a) Critical Section Problem (5M)
  - b) Deadlock Characterization (5M)
  - c) Virtualization in Distributed System (4M)

**[M16CST1104]**

**[M16CST1105]**  
I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
**COMPUTER ORGANIZATION AND ARCHITECTURE**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining and all questions carry equal marks  
Answer all parts of any Question at one place.

1. (a) Describe Arithmetic Shift micro operations. 7X2M=14M
  - (b) What is Instruction set completeness?
  - (c) What are the differences between microprocessor and micro program?
  - (d) Define control word
  - (e) Define Priority interrupts.
  - (f) What is the difference between real memory and virtual memory?
  - (g) Architectural classification schemes of computer
2. (a) Design and explain Arithmetic Logic unit with neat diagram. (7M)
  - (b) Explain selected logical micro operations with example. (7M)
3. (a) Explain Common Bus System in a basic computer (7M)
  - (b) Explain input output configuration in basic computer (7M)
4. (a) Explain about Addressing modes (7M)
  - (b) Explain general register organization (7M)
5. Explain micro programmed control unit with example (14M)
6. (a) Compare and contrast isolated I/O and memory mapped I/O. (7M)
  - (b) Explain about Asynchronous communication interface (ACI)? (7M)
7. (a) Explain address mapping using pages? (7M)
  - (b) What is the associate memory and what kind of operation it is more suitable? (7M)
8. Write short notes on
  - (i) Parallel Processing Applications (5M)
  - (ii) Reduced Instruction Set Computer (RISC) (5M)
  - (iii) Instruction Cycle (4M)

**[M16CST1105]**

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**[M16CST1106]**  
I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
**E-COMMERCE**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining and all questions carry equal marks  
Answer all parts of any Question at one place.

1. Answer the following: 7X2M=14M
  - (a) Market Research
  - (b) E-commerce
  - (c) Security in E-commerce
  - (d) Security Certificates
  - (e) RFID tags
  - (f) Digital Video and Electronic Commerce
  - (g) Value Added Networks
  
2. (a) Give Electronic Commerce-Frame Work required. Write all the applications of E-Commerce (7M)  
(b) Write all the Mercantile Process Models. Explain. (7M)
  
3. (a) Write the importance of Electronic Payment Systems. What are the various types of Electronic Payment Systems? (7M)  
(b) Explain the use of Smart Cards and Credit Cards in E-commerce. Give a detailed design of Electronic Payment System. (7M)
  
4. (a) How Electronic Data Inter-Change takes place? (7M)  
(b) Define and elaborate on EDI Implementation. What is the meaning of Value Added Networks? (7M)
  
5. (a) What is Intra Organizational Commerce? Briefly explain Work Flow Automation and Coordination. (7M)  
(b) What is the importance of Supply Chain Management in E-commerce? (7M)
  
6. (a) What is a Document Library? What are the various Digital Document Types available? (7M)  
(b) Write the importance of Corporate Data Ware-Houses. Elaborate on Corporate Data Warehouses. (7M)
  
7. (a) How advertising is done on Internet? Explain Online Marketing Process. (7M)  
(b) Explain various mechanisms for Information Search and Retrieval. (7M)
  
8. Write short notes on:
  - (a) Present scenario of Digital Video and Electronic Commerce market (5M)
  - (b) Importance of Video Conferencing (4M)
  - (c) Value Added Networks (5M)

**[M16CST1106]**

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[M16CST1107]

I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
EMBEDDED SYSTEMS

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place.

1. Answer the Following Questions 7X2M=14M
  - (a) Explain Atomic Operations; give any one atomic instruction for any processor known to you?
  - (b) Distinguish between Microprocessors and Microcontrollers
  - (c) What is priority inversion?
  - (d) What is watch dog timer in a single board computer? Explain.
  - (e) What are the two rules that an interrupt routine must adhere to in an RTOS environment?
  - (f) What is Interrupt latency?
  - (g) What is an event?
  
2.
  - (a) Explain the Architecture of 8051 with a neat diagram (7M)
  - (b) Explain bit manipulation instructions of 8051 (7M)
  
3.
  - (a) Explain Round Robin with interrupt architecture with a suitable Example. (7M)
  - (b) What is reentrancy? Give the necessary conditions to make a function reentrant. (7M)
  
4.
  - (a) What is a semaphore? Explain how semaphores are used to solve shared data Problem (7M)
  - (b) Explain various semaphores variants (7M)
  
5.
  - (a) Explain various inter task communication methods (7M)
  - (b) Explain timer functions (7M)
  
6.
  - (a) Explain Basic Design Principles of Embedded Systems (7M)
  - (b) Explain hard real time and soft real time scheduling considerations (7M)
  
7.
  - a) Explain tool chain for development embedded software (7M)
  - b) Explain the function of ROM emulator and in-circuit emulator (7M)
  
8. Write short notes on the following:
  - a) Logic analyzer (4M)
  - b) Application of Embedded Systems (4M)
  - c) Instruction set simulator (3M)
  - d) Tasks and task states (3M)

[M16CST1107]

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[M16CST1108]

I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
IMAGE PROCESSING

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Answer the Following 7X2M=14M
  - 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) What are the application of morphology in I.P
  
2. (a) Give an Algorithm for FFT. 2X7M=14M  
(b) Give an Algorithm for WFT.
  
3. (a) How do you Acquire an image? Explain in detail. 2X7M=14M  
(b) Define and explain image sliding and image stretching.
  
4. (a) Define and explain low pass filters in brief. 2X7M=14M  
(b) Define and edge. Explain various edge enhancement filters.
  
5. (a) Define prewitt filter. 2X7M=14M  
(b) Explain in detail "Homomorphic filter".
  
6. (a) Explain compression at the time of Image Transmission. 2X7M=14M  
(b) Explain about standardization in image compression.
  
7. (a) Explain split and merge technique for segmentation. 2X7M=14M  
(b) Explain segmentation by PIXEL based methods.
  
8. Write Short notes on the following
  - a) Image Classification(5M)
  - b) Erosion and Dilation of images.(5M)
  - c) Skeletanization(4M)

[M16CST1108]

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**[M16CST1109]**  
I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
**COMPUTER NETWORKS**

Time: 3 Hours

Max. Marks: 70

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First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. (a) Write the Types of Multiplexing. 7x2=14M  
(b) Explain the four cases of congestion with neat diagram.  
(c) Write about Service Primitives in Network Software.  
(d) Explain DNS?  
(e) Define the CSU.  
(f) Draw DTN Architecture  
(g) IP Address
  
2. (a) Compare OSI & TCP/IP Reference Models? 2x7=14M  
(b) Explain Network Topologies
  
3. (a) Compare Circuit & packet Switching 2x7=14M  
(b) Write about Wireless Transmission
  
4. (a) Briefly explain about Distance Vector Routing Algorithm. 2X7=14M  
(b) Write about congestion control Algorithms
  
5. (a) Explain one bit sliding window Protocol. 2X7=14M  
(b) Write about 802.3 Cabling in IEEE Standard 802.
  
6. Explain about Network Devices. 1x14=14M
  
7. Briefly explain about Internet Transport Protocols 1x14=14M
  
8. Write a short note on  
(a) Transmission media. (4M)  
(b) ATM Switches (6M)  
(c) World wide web (4M)

**[M16CST1109]**

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**[M16CST1110]**

I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
**CLOUD COMPUTING**

Time: 3 Hours

Max. Marks: 70

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First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Answer the following: 7X2M=14M
  - (a) Intranets Vs. Cloud
  - (b) Taxonomy Of Parallel Computing
  - (c) System Access Models
  - (d) Cluster Planning
  - (e) QsNet
  - (f) Hubs and Switches
  - (g) NIC Architecture.
  
2. (a) Give a Business Case explaining why one should go to the Cloud. (7M)  
(b) Write Cloud Computing Services and its Business Applications. (7M)
  
3. (a) Write all the security concerns of cloud computing and the concerned Regulatory Issues. (7M)  
(b) Explain how Cloud Computing is used by Google, Microsoft, Amazon, Salesforce.com. (7M)
  
4. (a) Write Web Applications relevant to Cloud Computing. Write a brief account of Web APIs. (7M)  
(b) What is the meaning of Cloud Storage Providers. Explain the relevant Infrastructure and Service needed for Cloud Storage Providers. (7M)
  
5. (a) Explain Software as a Service in detail. (7M)  
(b) How Mobile Device Integration is done. How Microsoft Online provides this? (7M)
  
6. (a) Explain how the Cloud Computing Applications by Google and Microsoft are developed. (7M)  
(b) Explain how the Cloud Computing Applications by Intuit QuickBase, Cast Iron Cloud and Bungee Connect are developed. (7M)
  
7. (a) Define Local Clouds. Explain how Thin Clients are useful in Local Clouds. (7M)  
(b) How Virtualization is useful in an Organization. Give a case study of McNeilus Steel. (7M)
  
8. Write short notes on:
  - (a) Cloud Storage Providers (5M)
  - (b) Cloud Services Aimed at the Mid-Market. (5M)
  - (c) Business applications of Cloud Computing. (4M)

**[M16CST1109]**

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[M16CST1111]

I/II M.Tech. CST I Semester Regular Examinations  
MODEL QUESTION PAPER  
**GRID COMPUTING**

Time: 3 Hours

Max. Marks: 70

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First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Answer the following: 7X2M=14M
  - (a) Parallel Computing
  - (b) Distributed Computing
  - (c) Cluster Computing
  - (d) Grid Computing
  - (e) Meta data
  - (f) Ontology
  - (g) Semantic Web
  
2. (a) Write characterization of Grids. Explain. (7M)  
(b) Explain Grid Computing Road Maps. (7M)
  
3. (a) Explain Architecture of Grid and Grid Computing. (7M)  
(b) Elaborate on the Web Services OGSA and WSRF. (7M)
  
4. (a) What is Grid Monitoring Architecture (GMA)? Give a brief account of GridICE. (7M)  
(b) What is Network Weather Service? Briefly explain Ganglia and GridM. (7M)
  
5. (a) What is a Grid Middleware? Give an overview. (7M)  
(b) Draw the architecture and show the components of Globus Toolkit and gLite. Write their features too. (7M)
  
6. (a) What are Collective Data Management Services and Federation Services? (7M)  
(b) Define Grid Portal. Briefly explain Second Generation Grid Portals. (7M)
  
7. (a) What is a Semantic Web service? Explain layered structure of the Semantic Grid. (7M)  
(b) What is Autonomic Computing? Write all the Semantic Grid activities. (7M)
  
8. Write short notes on:
  - (a) Scheduling and Resource Management useful for Grid Security (4M)
  - (b) Working principles of Scheduling. (4M)
  - (c) SGE system (3M)
  - (d) LSF system (3M)

[M16CST1111]

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[M16CST1112]

I/II M.Tech. CST I Semester Regular Examinations

MODEL QUESTION PAPER

**COMPUTER GRAPHICS&VISUAL COMPUTING**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Explain the following: 7X2M=14M
  - a) Frame Buffer
  - b) Homogeneous Coordinates
  - c) Graphics Work stations
  - d) GUI
  - e) Antialiasing.
  - f) View port
  - g) Blending functions of B-Spline curves?
2. (a) Describe the working of a CRT. What are the differences between the raster scan and random scan devices? (7M)  
(b) Explain how the Bresenham's line drawing algorithm works for the line joining the points (-1, 2) and (7, 5). (7M)
3. (a) Describe Cohen - Sutherland algorithm for line clipping. (7M)  
(b) Explain how the Sutherland - Hodgman algorithm for polygon clipping. (7M)
4. (a) Describe the matrix forms of the two dimensional transformations of translation, rotation and scaling. (7M)  
(b) Derive the transformation matrix for finding the reflection of a point with respect to the line  $y = mx + c$ . (7M)
5. (a) Describe various graphic input devices explaining their logical functions (7M)  
(b) Describe the methods for character generation. (7M)
6. (a) Describe the 3D transformations for rotation, scaling and translation (7M)  
(b) Find the combined matrix transformation of the following:  
3D rotation of an object by  $\alpha$  degrees around X- axis followed by a 3D rotation of  $\beta$  degrees around Y- axis, which in turn is translated with a units along X- axis, b units along Y-axis c units along Zaxis. (7M)
7. a) Explain Computational and mathematical methods for creating, capturing digital photographs(7M)  
b) Discuss in detail about image and video compression techniques (7M)
8. Write Short notes on the Following
  - (a) Edge detection in image and videos (5M)
  - (b) Analyzing and manipulating digital photographs (5M)
  - (c) Matrix transformation for standard perspective projection (4M)

[M16CST1112]

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[M16CST1201]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Briefly explain the following: 7 X 2 = 14M  
a) State Space Representation of AI Problem  
b) Production System Characteristics  
c) Procedural vs Declarative Knowledge  
d) Expert system Shells  
e) Heuristic Function  
f) Partitioned Semantic Nets  
g) Bayesian Network
2. a) Explain about State Space Representation of Water Jug Problem (7M)  
b) Explain Problem Characteristics with examples (7M)
3. a) Explain Best First Search Algorithm with an Example (7M)  
b) Apply AI Techniques to find the solution of the following Crypt- arithmetic Problem (7M)  
CROSS  
ROADS  
-----  
DANGER  
-----
4. a) Explain how a wff in predicate calculus can be converted into Clauses (7M)  
b) Explain with an example Unification & Resolution in Predicate Logic (7M)
5. a) Show how semantic nets and Frames can be captured in Logic with appropriate Examples (7M)  
b) Write the CD Representation of the Sentence John fertilized fields with a Special Tool (7M)
6. a) Explain The Dependency back tracking in Truth Maintenance System with an example (7M)  
b) What is a Certainty factor and explain how certainty factors are related to Rule Based Systems of the Sentence. (7M)
7. a) Write a neat diagram the structure of a Rule Based Expert System and Explain its Components (7M)  
b) Explain Syntactic Processing and Augmented Transition Nets (7M)
8. Write Short on  
a) Natural Deduction (4M)  
b) Forward Versus Backward Reasoning, (5M)  
c) Expert System Shells (5M)

[M16CST1201]

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**[M16CST1202]**  
I/II M.Tech. Semester Regular Examinations  
MODEL QUESTION PAPER  
**OBJECT ORIENTED SOFTWARE ENGINEERING**  
**(Common for M.Tech(CST,IT))**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining and All questions carry equal marks  
Answer all parts of any Question at one place.

1. Answer the following 7X2M=14M
  - (a) Explain about software process
  - (b) Explain about an error, fault and failure
  - (c) What is project management?
  - (d) Write two disadvantages of the water fall model
  - (e) Write two advantages of PERT chart
  - (f) Explain about Reusability & re-use
  - (g) Cost estimation in software process
2. (a) What are the five of the most important attributes of software quality? Explain them. (7M)  
(b) What do you mean by Domain Analysis? What are the main components of a Domain Document? (7M)
3. (a) Discuss in detail about the Functional and Non-functional Requirements of Student Registration Application. (7M)  
(b) Explain the techniques for Gathering and analyzing Requirements. (7M)
4. a) What are Objects & Classes? Discuss about the Essential features of Class Diagrams. (7M)  
b) Draw a Class Diagram for Bank account management System. (7M)
5. (a) What do you mean by User-centered Design? Discuss the different ways to make software user-centred Design. (7M)  
(b) For a library system, draw a use case diagrams and use case Descriptions that shows which actor perform which use cases and write SRS document. (7M)
6. (a) What do you mean by Software architecture? Discuss in detail about the MVC Architectural Pattern. (7M)  
(b) Draw a sequence diagram and a corresponding collaboration diagram for student registration system. (7M)
7. (a) Discuss in detail about the different Software Processes Models. (7M)  
(b) Explain Software Architecture Contents Of An Architecture Model. (7M)
8. Write Short Notes on the Following
  - a. Informal use case analysis (5M)
  - b. Alpha and Beta Testing (5M)
  - c. Usability Vs utility (4M)

**[M16CST1202]**

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[M16CST1203]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
COMPILER DESIGN

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining  
Answer all parts of any Question at one place.

1. Explain the Following 7X2=14M  
(a) Regular expression and Finite Automata  
(b) Lexical Analysis Vs Parsing  
(c) Operator Precedence Parsing  
(d) Semantic Checking  
(e) Three Address Code  
(f) Basic Blocks and Flow Graphs  
(g) Error Handling Routines.
2. (a) Give a brief account of Structure and Different Phases of a Compiler. Explain How does a Compiler differ from an interpreter 7M  
(b) Explain with an Example how to derive a Finite Automata from Regular Expressions 7M
3. (a) What is the purpose of Lexical Analyzers? Give a brief account of various approaches to design Lexical Analyzers. 7M  
(b) How Finite automata, Regular Expressions are useful for lexical analysis. What is Lexical Analyzer Generator LEX? 7M
4. (a) What is Yacc? How can we create a parser using YACC 7M  
(b) Explain LR Parsing . Construct SLR parsing Table for the Grammar 7M  
 $C \rightarrow CC$   
 $C \rightarrow c/d$
5. (a) What is Syntax Directed Translation. How to Implement Syntax Directed Translator. 7M  
(b) Explain Three Address Code-Translation of Expressions. 7M
6. (a) What is DAG Representation of Basic Blocks? 7M  
(b) Write the applications of DAG. What are the uses of Data Flow Equations and Computations. 7M
7. (a) Explain Code Generation Algorithm. 7M  
(b) What is Optimal Code Generation for Expressions? Explain the process of Code Generation from DAGs. 7M
8. Write short notes on the Following  
(a) Data Structures used for Symbol Tables 4M  
(b) Peephole optimization 6M  
(c) Data Flow Equation 4M

[M16CST1203]

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[M16CST1204]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER

**DATA WAREHOUSING AND DATA MINING**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks  
Answer all parts of any Question at one place.

1. Briefly discuss. 7X2M=14M  
(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
2. (a) What is data mining? Briefly describe the components of a data mining system. 2X7M=14M  
(b) What are the major issues in Data Mining? Briefly describe important Applications of Data mining
3. (a) Write the differences between operational database and data warehouse. 2X7M=14M  
(b) Briefly describe 3-tier Data warehouse architecture
4. (a) Discuss in detail about the Data Preprocessing Techniques 2X7M=14M  
(b) Propose an algorithm in pseudo-code for automatic generation of a concept hierarchy for categorical data based on the number of distinct values of attributes in the given schema.
5. (a) Discuss the essential features of a typical data mining query language like DMQL. 2X7M=14M  
(b) Explain  
(i) FP Growth Algorithm  
(ii) Apriori Algorithm
6. (a). Discuss about Back propagation algorithm for neural network-based classification of data. 2X7M=14M  
(b). Explain the Concept of SVM and Algorithm for classification of linear and non-linear data
7. (a) Write about different types data in cluster analysis. Explain briefly Density based Clustering Method  
(b) Explain the major Concepts in Semantic Web mining 2X7M=14M
8. Write Short Notes on the Following  
(a). GUI based DMQL (4M)  
(b) Genetic Algorithms (4M)  
(c) Web Mining Vs semantic web mining (3M)  
(d) Hierarchical Clustering Methods (3M)

[M16CST1204]

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[M16CST1205]

I/II M.Tech. CST II Semester Regular Examinations

MODEL QUESTION PAPER

**PARALLEL PROGRAMMING**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place.

1. Answer the following: 7X2M=14M
  - (a) Parallel Architectures
  - (b) Problems Unique to Parallel Programming
  - (c) Data Parallelism
  - (d) Direct and Indirect Network Topology
  - (e) Torus and Butterfly Network
  - (f) Cost and Scalability
  - (g) Data Parallelism.
  
- 2.(a) Differentiate between MIMD and SPMD Models. 2X7M=14M  
(b) Write the various Parallel Programming Models in detail.
  
- 3.(a) Write the importance of Data Dependence Graph. 2X7M=14M  
(b) Elaborate on Pipelining and Data Clustering.
  
- 4.(a) Explain the Bus, Star, Ring, Mesh, Tree topologies. 2X7M=14M  
(b) What is Perfect Shu E Network.
  
- 5.(a) Differentiate between Linear And Super linear Speedup. Explain Amdahls Law and Amdahl Effect. 2X7M=14M  
(b) Explain the Karp-Flatt Metric and the Iso-Efficiency Metric.
  
- 6.(a) Explain PRAM, EREW, CREW and ERCW algorithms. 2X7M=14M  
(b) Explain CRCW, Simulating CRCW, CREW and PRAM Algorithms.
  
- 7.(a) Explain the Parallel Programming Model PVM. 2X7M=14M  
(b) Explain the Parallel Programming Model MPI.
  
8. Write short notes on:
  - (a) Parallel Algorithms used on Network (5M)
  - (b) MPI program for Multiplication of Matrices (5M)
  - (c) OpenMP (4M)

[M16CST1205]

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**[M16CST1206]**  
I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
**SEMANTIC WEB**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory  
Answer any four from the remaining and All questions carry equal marks  
Answer all parts of any Question at one place.

1. Answer the following 7X2M=14M
  - (a) Explain about software process
  - (b) Explain about an error, fault and failure
  - (c) What is project management?
  - (d) Write two disadvantages of the water fall model
  - (e) Write two advantages of PERT chart
  - (f) Explain about Reusability & re-use
  - (g) Cost estimation in software process
2. (a) What are the five of the most important attributes of software quality? Explain them. (7M)  
(b) What do you mean by Domain Analysis? What are the main components of a Domain Document? (7M)
3. (a) Discuss in detail about the Functional and Non-functional Requirements of Student Registration Application. (7M)  
(b) Explain the techniques for Gathering and analyzing Requirements. (7M)
4. a) What are Objects & Classes? Discuss about the Essential features of Class Diagrams (7M)  
b) Draw a Class Diagram for Bank account management System (7M)
5. (a) What do you mean by User-centered Design? Discuss the different ways to make software user-centered Design (7M)  
(b) For a library system, draw a use case diagrams and use case Descriptions that shows which actor perform which use cases and write SRS document. (7M)
6. (a) What do you mean by Software architecture? Discuss in detail about the MVC Architectural Pattern (7M)  
(b) Draw a sequence diagram and a corresponding collaboration diagram for student registration system. (7M)
7. (a) Discuss in detail about the different Software Processes Models (7M)  
(b) Explain Software Architecture Contents Of An Architecture Model (7M)
8. Write Short Notes on the Following
  - a. Informal use case analysis (5M)
  - b. Alpha and Beta Testing (5M)
  - c. Usability Vs utility (4M)

**[M16CST1206]**

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[M16CST1207]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
BIG DATA ANALYTICS

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place.

1. Explain the Following 7X2M=14M
  - (a) Big Data
  - (b) Ontology
  - (c) Data Privacy Protection
  - (d) Decision Engines
  - (e) Discovery Using Data at Rest
  - (f) Data Streams
  - (g) Page Ranking in web search engines
  
2. (a) Define the drivers for Big Data-Velocity, Variety, and Veracity. (7M)  
(b) Write at least four Big Data Analytics Applications in detail. (7M)
  
3. (a) Explain Massively Parallel Processing (MPP) Platforms architecture in detail. (7M)  
(b) Define Unstructured Data Analytics. Elaborate on Context-Sensitive and Domain-Specific Searches. (7M)
  
4. (a) Explain Real-Time Architecture for Conversations in detail. (7M)  
(b) Elaborate on Orchestration and Synthesis used in Analytics Engines. (7M)
  
5. (a) How Big Data Analytics is Implemented? Explain. (7M)  
(b) Explain about Big Data Governance. How Big Data can be integrated with MDM. (7M)
  
6. (a) Explain Map-reduce framework in detail. Draw the architectural diagram for Physical Organization of Compute Nodes. (7M)  
(b) Define HDFS. Explain HDFS in detail. (7M)
  
7. (a) What is Complexity Theory for Map-Reduce? What is Reducer Size and Replication Rate? (7M)  
(b) Elaborate on Graph Model and Mapping Schemas. What do you mean by Lower Bounds on Replication Rate? (7M)
  
8. Write Short notes on the following
  - a) Stream Data Model & Stream Queries (5M)
  - b) Graph Model and Mapping Schemas (5M)
  - c) Knowledge Hubs and Authorities (4M)

[M16CST1207]

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**[M16CST1208]**

I/II M.Tech. CST II Semester Regular Examinations

MODEL QUESTION PAPER

**DATABASE SECURITY**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place

1. Briefly explain the following 7x2=14
  - a. Security Risks.
  - b. User Authentication.
  - c. Database Security Basics.
  - d. Single Sign-On
  - e. Data Integrity.
  - f. Audit to XML Files.
  - g. Cipher Block Modes.
  
2. (a) Explain Fundamental Data Security Requirements. 2x7=14  
(b) Explain the steps to Secure database
  
3. (a) Explain the Trust Management & Negotiation 2x7=14  
(b) Creating Fixed Database Links & Encrypting Database Link Passwords
  
4. (a) Explain about Spatial Database Security & Reengineering. 2x7=14  
(b) How to Configuring SSL on the Server
  
5. Explain about Database Security Issues. 1x14=14
  
6. (a) Write about Policy Trends in Database Control. 2x7=14  
(b) Explain about Privacy-Preserving Data Mining & Data Publishing
  
7. Write about Database Auditing 1x14=14
  
8. Write a short note on
  - (a) Transparent Data Encryption. (4M)
  - (b) Data Masking Primitives And Routines (4M)
  - (c) Hash and Message Authentication Code (6M)

**[M16CST1208]**

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[M16CST1209]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
MOBILE COMPUTING

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks  
Answer all parts of any Question at one place.

1. Answer the Following 7X2M=14M
  - (a) Ubiquitous Network
  - (b) Fixed Network Transmission Hierarchy
  - (c) Cellular Networks.
  - (d) Wireless PANs
  - (e) Java Card
  - (f) CDMA
  - (g) GSM
  
2. (a) What is Three-Tier Architecture for Mobile Computing. Explain. 2X7M=14M  
(b) Give a brief account of Mobile Devices and Mobile-Enabled Applications.
  
3. (a) Explain various generations in Wireless Networks. 2X7M=14M  
(b) Write all the approaches for Traffic Routing in Wireless Networks.
  
4. (a) Explain WLAN Standard IEEE 802.11 in detail. 2X7M=14M  
(b) Compare IEEE 802.11a, B, G and N Standards.
  
5. (a) Differentiate between Bluetooth and Radio Frequency Identification (RFID). 2X7M=14M  
(b) Differentiate GSM and GPS.
  
6. (a) How data is replicated for Mobile Computers. 2X7M=14M  
(b) Explain Data Services in GPRS and applications for GPRS.
  
7. (a) Explain Push-Based and Pull-Based Mechanisms. 2X7M=14M  
(b) What is a 3G Network. Write its Applications.
  
8. Write short notes on the Following  
(a) Wireless Application Protocol. (5M)  
(b) Mobile Computing Over SMS (5M)  
(c) GPRS Applications (4M)

[M16CST1209]

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[M16CST1210]

I/II M.Tech. CST II Semester Regular Examinations

MODEL QUESTION PAPER

SOFT COMPUTING

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place.

1. Explain the following 7X2M=14M
  - (a) Genetic Programming
  - (b) Fuzzy Sets Vs. Crisp Sets
  - (c) Fuzzy Pattern Recognition
  - (d) Fuzzy Image Processing
  - (e) Fuzzy Database
  - (f) Hebb's Learning
  - (g) Boltzmann Machine.
  
2. (a) What is Adaptive Resonance Theory? Explain. 2X7M=14M  
(b) What are the various Tools and Techniques useful for Soft computing. Write the Applications of Soft computing.
  
3. (a) Give a detailed description of Operations on Fuzzy Sets. 2X7M=14M  
(b) Explain Fuzzy Logic in detail. Give its Applications.
  
4. (a) How interference in fuzzy logic can be achieved? 2X7M=14M  
(b) Give a brief account of all the Fuzzy algorithms. Explain Fuzzifications and Defuzzification concept.
  
5. (a) Give a detailed description of various Artificial Neural network architectures. 2X7M=14M  
(b) Give a detailed description of various learning techniques.
  
6. (a) Write the Back Propagation Algorithms. Discuss the Convergence issues in the back propagation algorithms. 2X7M=14M  
(b) Explain Adaptive Resonance Theory in detail. Write their Applications.
  
7. (a) Define Genetic Algorithms. Explain the various Operators of GA. 2X7M=14M  
(b) Give the Hypothesis of Building Blocks. Define Simulated Annealing and Stochastic Models. Explain.
  
8. Write Short notes on the following
  - (a) Rough Sets. (4M)
  - (b) Decision Tables and their Applications. (4M)
  - (c) Neural-Network-Based Fuzzy Systems. (3M)
  - (d) Genetic Algorithms for Neural Network. (3M)

[M16CST1210]

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[M16CST1211]

I/II M.Tech. CST II Semester Regular Examinations

MODEL QUESTION PAPER

**CLUSTER COMPUTING**

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place

1. Explain the Following 7X2M=14M
  - (a) Infiniband
  - (b) Taxonomy of Parallel Computing
  - (c) System Access Models
  - (d) Cluster Planning
  - (e) QsNet
  - (f) Hubs and Switches
  - (g) NIC Architecture.
  
2. a) Define Cluster Computing and Parallel Computing. Give the Hardware System Structure useful for Cluster Computing. 2X7M=14M  
(b) Explain how Resource Management is done in Cloud Computing. What is Distributed Programming? Write its Limitations.
  
3. (a) What is Cluster Planning? Draw the Architecture of Cloud computing. 2X7M=14M  
(b) Define and elaborate on Node Hardware and Node Software.
  
4. (a) Explain cLAN and QsNet in detail. 2X7M=14M  
(b) Give a detailed description of NIC Architecture. Write the functionalities of hubs and Switches.
  
5. (a) Give a detailed account of Distributed File systems. 2X7M=14M  
(b) What is Remote Command Execution? What is the mechanism for Remote Command Execution?
  
6. (a) What are the System Access Models available? How assigning names is done in Cluster Setup. 2X7M=14M  
(b) How Node Software is installed? Explain basic cluster administration.
  
7. (a) What are the Cluster Workload Management Activities? Explain. 2X7M=14M  
(b) Explain Resource Management and Accounting in detail.
  
8. Write Short notes on the following
  - (a) Virtualization. (4M)
  - (b) Programming with parallel File systems. (5M)
  - (c) Scheduling in Cluster management (5M)

[M16CST1211]

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[M16CST1212]

I/II M.Tech. CST II Semester Regular Examinations  
MODEL QUESTION PAPER  
PERVASIVE COMPUTING

Time: 3 Hours

Max. Marks: 70

First Question is Compulsory

Answer any four from the remaining and All questions carry equal marks

Answer all parts of any Question at one place

1. Explain the Following 7X2M=14M
  - (a) Ubiquitous Computing
  - (b) Smart Cards and Smart Appliances
  - (c) Home Networks.
  - (d) WAP
  - (e) Digital Signatures
  - (f) Wireless Markup Language,
  - (g) Bluetooth
  
2. (a) Explain Pervasive Computing Principles - Decentralization, Diversification, Connectivity, Simplicity. 2X7M=14M  
(b) Define Pervasive Information Technology. Explain
  
3. (a) Explain Pervasive Architecture in detail. 2X7M=14M  
(b) Give Pervasive Web Application Architecture. Explain in detail.
  
4. (a) Give all the Pervasive Devices Categories. Write their Characteristics. 2X7M=14M  
(b) Explain Software Components in the Pervasive Devices. Define Smart Identification and Embedded Controls.
  
5. (a) What are the protocols for Pervasive Connectivity? 2X7M=14M  
(b) What is Mobile Internet? Explain Short Range Wireless Communication mechanisms- DECT, Bluetooth, IRDA.
  
6. (a) Give a brief account of Home Automation systems, Energy and Security Services and Remote Home Health Care Services. 2X7M=14M  
(b) Explain about Interactive Advertisement, Shopping, Payment Services.
  
7. (a) Define Pervasive Synchronization. Give various Models of Synchronization. 2X7M=14M  
(b) Give a brief account of Industry Data Synchronization Standards- Infrared Mobile Communications, WAP and Syncml.
  
8. Write Short notes on the following
  - (a) Web Services Security (4M)
  - (b) Security in Pervasive computing. (4M)
  - (c) Light Weight Symmetric Algorithms and Applications (3M)
  - (d) Light Weight Asymmetric Cryptographic Algorithms (3M)

[M16CST1212]

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