*Elective PriPeop*
*ALL BRANCHES*

**Hall Ticket Number:**

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**B.TECH. DEGREE EXAMINATION, JULY-2023**

Semester IV [Second Year] (Regular)

**HDL PROGRAMMING**

Time: Three hours

Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)

Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

| | | |
|---|---|---|
| (a) | What are primitives in Verilog? | CO1 |
| (b) | Write Verilog language rules. | CO1 |
| (c) | Write the differences between single pass behaviour and cyclic behavior. | CO1 |
| (d) | Define four valued logic. | CO2 |
| (e) | Write the syntax of IF statement in Verilog. | CO2 |
| (f) | Write the differences between CASE and CASEX. | CO1 |
| (g) | What is an event control expression? | CO1 |
| (h) | Define Metastability. | CO2 |
| (i) | Write the syntax of conditional operator. | CO3 |
| (j) | What is ASMD? | CO1 |
| (k) | When a circuit will be synthesized to latch? | CO3 |
| (l) | What is accidental synthesis of latch? | CO4 |
| (m) | How many address bits required for 32K memory? | CO4 |
| (n) | Differentiate between PLA and PAL. | CO4 |

**UNIT – I**

2. What are various modeling techniques available in Verilog and explain each one with an example?　CO1

(OR)

3. (a) Design 2-bit Comparator and write Verilog code for it.　(8M) CO2

(b) Explain test bench template and write test bench code for a full adder.　(6M) CO2

UNIT – II

4. (a) Differentiate between non-blocking and blocking statements with an example for each one. (8M) CO2
   (b) Write Verilog code for D-flip flop and SR-flip flop. (6M) CO2

(OR)

5. (a) Explain about delays in Verilog. (6M) CO2
   (b) Design and develop 4-bit right shift register using Verilog. (8M) CO2

UNIT – III

6. (a) Design Four channel MUX with three-state output and write Verilog code. (7M) CO3
   (b) Design Priority encoder and write Verilog code by using both IF and CASE statements. (7M) CO3

(OR)

7. (a) Develop Verilog code for 8 x 3 encoder using case statement and draw simulation waveforms. (7M) CO3
   (b) With a neat block diagram explain the operation of LFSR and write Verilog code for it. (7M) CO3

UNIT – IV

8. (a) Discuss how combinational circuits can be synthesized with proper examples. (8M) CO4
   (b) Design a sequence detector to find 111 sequence using Mealy state machine and write a Verilog code for it. (6M) CO4

(OR)

9. (a) Discuss the operation of Erasable PROM along with neat sketches. (7M) CO4
   (b) Design ROM based state machine and design BCD to Excess-3 code converter using ROMs. (7M) CO4

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**VLMR1 (R20)**

**FSMR2 (R20)**

## B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

### CLIENT SIDE SCRIPTING

Time: Three hours

Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

| | | |
|---|---|---|
| (a) | What is Dynamic HTML? | CO1 |
| (b) | State the difference between ROWSPAN and COLSPAN in a HTML table. | CO1 |
| (c) | How do you create a hyperlink in HTML? | CO1 |
| (d) | What is FBLM? | CO1 |
| (e) | Define DOM. | CO2 |
| (f) | What is event bubbling? | CO2 |
| (g) | What is image manipulation? | CO2 |
| (h) | When we can say that XML file is well formed and validated. | CO3 |
| (i) | Mention three technologies in XSL. | CO3 |
| (j) | List few web servers. | CO3 |
| (k) | What is XMLHttpRequest Object? | CO3 |
| (l) | State the use of css() method in JQuery. | CO4 |
| (m) | Mention the core features of jQuery. | CO4 |
| (n) | What is a jQuery selector? | CO4 |

### UNIT – I

2. (a) Create a simple HTML page which demonstrates the use of various types of lists. Try adding a definition list which uses an unordered list to define term. (7M) CO1

   (b) Explain about different types of cascading style sheets with examples. (7M) CO1

UNIT – IV

8. (a) Create a custom event handler in jQuery? (7M) CO4
   (b) How to manipulate attributes using jQuery. (7M) CO4

(OR)

9. (a) Explain the methods that assist you in manipulating HTML and text content in jQuery? (7M) CO4
   (b) Explain the different jQuery css() methods. (7M) CO4

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**FSMR2 (R20)**

(OR)

3. (a) Briefly explain about the following popup boxes in JavaScript with examples.
   (i) Alert Box (ii) Confirm Box (iii) Prompt Box (7M) CO1
   (b) Demonstrate a JavaScript that reads a number and checks whether it is palindrome or not. (7M) CO1

UNIT – II

4. (a) Explain the following built-in objects of JavaScript: (7M) CO2
   (i) Window
   (ii) Document
   (b) Write java scripts covering (7M) CO2
   (i) Function (reverse of a given number)
   (ii) Arrays (Matrix addition)

(OR)

5. (a) Explain how to draw Quadratic curves and Bezier curves. (7M) CO2
   (b) Explain linear gradients. How these are different from radial gradients? (7M) CO2

UNIT – III

6. (a) Explain well-formed and valid XML document rules with suitable example (7M) CO3
   (b) Define an XML Schema. Show how an XML schema can be created. (7M) CO3

(OR)

7. (a) Develop and explain a simple AJAX application. (7M) CO3
   (b) Distinguish client-side scripting versus server-side scripting. (7M) CO3

Hall Ticket Number:

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CSMR4 (R20)

B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

## RELATIONAL DATABASE MANAGEMENT SYSTEMS

Time: Three hours

Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)

Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

| | | |
|--|--|--|
| (a) | Define the term 'Database Schema'. | CO1 |
| (b) | What is conceptual data independence? | CO1 |
| (c) | Who is database administrator? | CO1 |
| (d) | Define the term 'derived attribute'. | CO2 |
| (e) | What is a weak entity? | CO2 |
| (f) | What is a key? | CO2 |
| (g) | List DCL commands. | CO3 |
| (h) | Differentiate between super key and candidate key. | CO3 |
| (i) | Define a non-procedural language. | CO3 |
| (j) | Write syntax for delete command. | CO4 |
| (k) | Define durability property of a transaction. | CO4 |
| (l) | Define the concept of 'trivial FD'. | CO4 |
| (m) | What is a concurrent transaction schedule? | CO4 |
| (n) | What is conflict serializability? | CO4 |

## UNIT – I

2. (a) What are the characteristics of a database approach? (7M) CO1

   (b) Who are the users of a DBMS and how do they interact with DBMS. (7M) CO1

(OR)

3. (a) Explain various database languages with examples. (7M) CO1

   (b) Explain client /server architectures for DBMS. (7M) CO1

8. (a) What are the various anomalies in database design? How normalization helps in removing anomalies? (7M) CO4

   (b) Explain First, Second and Third Normal Forms. (7M) CO4

(OR)

9. (a) Explain ACID properties of transactions. (7M) CO4

   (b) Explain about serializability and non-serializable transaction schedules with suitable examples. (7M) CO4

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**CSMR4 (R20)**

UNIT – II

4. (a) Illustrate weak and strong entity types with examples. (7M) CO2

   (b) How entity sets, attributes and keys are identified during database design? Explain with an example. (7M) CO2

(OR)

5. Model the ER diagram for a banking system database. CO2

UNIT – III

6. (a) List and explain DML commands with examples. (7M) CO3

   (b) Explain about advantages and disadvantages of using views. (7M) CO3

(OR)

7. (a) Create the following tables using SQL commands (specify primary key and foreign key constraints ) (6M) CO3

   **Sailors**(sid: integer , sname: string, rating: integer, age: real);

   **Boats**(bid: integer , bname: string, color: string);

   **Reserves**(sid: integer, bid: integer, day: date ).

   (b) Write Queries for the following (8M) CO3

   (i) Find the names of sailors who have reserved a red boat and list in the order of age.

   (ii) Find the ids of sailors who have reserved a red boat or a green boat.

   (iii) Find the name and the age of the youngest sailor.

   (iv) Find the colors of the boats reserved by the sailor rubber

# B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

## INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Time: Three hours                                                                           Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)

Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

   (a) Define intelligent agent.                                                                    CO1
   (b) What is uninformed search strategy?                                                          CO1
   (c) Define heuristic function.                                                                   CO1
   (d) What do you mean by rationality?                                                             CO1
   (e) Which is the best way to go for game playing                                                 CO2
       problem?
   (f) A* algorithm is based on which search method?                                                CO2
   (g) Define the term backtracking search.                                                        CO2
   (h) What is alpha-beta pruning?                                                                  CO3
   (i) What are the standard quantifiers of First Order                                             CO3
       Logic?
   (j) Define Existential Quantifier with an example.                                               CO3
   (k) Differentiate forward chaining and backward                                                  CO3
       chaining.
   (l) Give Existential instantiation of ∃x Cap(x) ∧                                                CO4
       OnHead(x, Johnny).
   (m) What does Partial order in planning involve?                                                 CO4
   (n) Define resolution.                                                                           CO4

## UNIT – I

2. (a) Distinguish between breadth first search and                                          (7M) CO1
       depth first search.
   (b) Outline the PEAS descriptors for the problem                                          (7M) CO1
       tomato classification system.

(OR)

3. (a) You are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has unlimited water which you can use to fill the jug and the ground on which water may be poured. Neither jug has any measuring markings on it. How can you get exactly 2 gallons of water in the 4-gallon jug? Write any one solution to the given problem. (7M) CO1

(b) Explain utility based agents with a block diagram. (7M) CO1

UNIT – II

4. (a) Explain MinMax algorithm and draw game tree for Tic Tac Toe Game. (7M) CO2

(b) Why does the hill climbing algorithm only produce a local maximum? Explain. (7M) CO2

(OR)

5. (a) Explain the A* algorithm in detail. (7M) CO2

(b) Trace the constraint satisfaction procedure by solving this cryptharthimetic problem.

CROSS
+ ROADS
_____
DANGER

(7M) CO2

UNIT – III

6. (a) Represent the following FOL using quantifiers. (7M) CO3
(i) All birds fly.
(ii) Every man respects his parent.
(iii) Some boys play cricket.
(iv) Not all students like both Mathematics and Science.
(v) Only one student failed in Mathematics.

(b) What are the steps associated with the knowledge engineering process? (7M) CO3

(OR)

7. (a) How do you represent the knowledge base for the Wumpus world? (7M) CO3

(b) Explain the syntax and semantics of first order logic. (7M) CO3

UNIT – IV

8. (a) The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove that Colonel West is a criminal
• American(x): x is an American
• Weapon(x): x is a weapon
• Hostile(x): x is a hostile nation
• Criminal(x): x is a criminal
• Missile(x): x is a missile
• Owns(x, y): x owns y
• Sells(x, y, z): x sells y to z v
• Enemy(x, y): x is an enemy of y
• Constants: America, Nono, West
(7M) CO4

(b) Discuss about forward chaining algorithm. (7M) CO4

(OR)

9. (a) For each pair of atomic sentences give the most general unifier if it exists:
(i) P(A, B, B), P(x, y, z)
(ii) Q(y, G(A, B)), Q(G(x, x), y)
(iii) Older(Father(y), y), Older(Father(x), John)
(iv) Knows(Father(y), y), Knows(x, x)
(7M) CO4

(b) Explain the components of a good planning system. (7M) CO4

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CMMR1 (R20)

CCMR1 (R20)

B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

## PRINCIPLES OF CLOUD COMPUTING

Time: Three hours

Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

| | | |
|---|---|---|
| (a) | Define cloud. | CO1 |
| (b) | What is service- oriented computing. | CO1 |
| (c) | What is the innovative characteristic of cloud computing? | CO1 |
| (d) | What is live migration? | CO2 |
| (e) | Define isolation feature in virtualization. | CO2 |
| (f) | What is emulation? | CO2 |
| (g) | Distinguish between privileged and non-privileged instructions | CO2 |
| (h) | Classify cloud computing services? | CO3 |
| (i) | Give an example of the public cloud. | CO3 |
| (j) | List types of clouds. | CO3 |
| (k) | What does Infrastructure-as-a-Service refer to? | CO3 |
| (l) | What are Dropbox and iCloud? | CO4 |
| (m) | Define Gene expression profiling. | CO4 |
| (n) | Write some examples of media applications that use cloud technologies. | CO4 |

## UNIT – I

2. (a) What is cloud computing? And provide the characteristics and benefits of cloud computing. (7M) CO1

(b) Explain about Distributed Systems. (7M) CO1

(OR)

3. (a) Explain the Cloud Computing platforms and technologies. (7M) CO1

(b) Distinguish between parallel and distributed computing. (7M) CO1

## UNIT – II

4. (a) What is virtualization? What are the characteristics of virtualized environments? (7M) CO2
   (b) Discuss classification or taxonomy of virtualization at different levels. (7M) CO2

(OR)

5. (a) Write pros and cons of Virtualization. (7M) CO2
   (b) Illustrate Virtualization technology examples. (7M) CO2

## UNIT – III

6. (a) Classify the various types of clouds. (7M) CO3
   (b) Explain the Platform-as-a-Service reference model. (7M) CO3

(OR)

7. (a) What are the basic components of an Iaas-based solution for cloud computing? (7M) CO3
   (b) Discuss some examples of Iaas implementations. (7M) CO3

## UNIT – IV

8. (a) Discuss how cloud computing technology can be applied to support remote ECG monitoring. (7M) CO4
   (b) What fundamental advantages does cloud technology bring to scientific applications? (7M) CO4

(OR)

9. Explain about Microsoft azure platform. CO4

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**CCMR1 (R20)**

2

Hall Ticket Number:

ITH14 (R20)

B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

**MEAN WEB DEVELOPMENT**

Time: Three hours                                                           Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1.  Answer the following:

    (a)  What is Node.js?                                                              CO1
    (b)  Name the components of MEAN.                                                  CO1
    (c)  State the uses of Node Package Manager.                                       CO1
    (d)  What is the difference between blocking I/o and                              CO1
         nonblocking I/o.
    (e)  What module is used to create a http server?                                 CO1
    (f)  What is MongoDB?                                                             CO2
    (g)  Distinguish between database, collection, and                               CO2
         document.
    (h)  What is the use of Express module?                                           CO3
    (i)  Define middleware. Where middleware is used?                                 CO3
    (j)  Write the syntax for adding the cookieSession                               CO3
         middleware.
    (k)  What is the use of modules?                                                  CO4
    (l)  Give the benefits Template engines provide.                                  CO4
    (m)  State the use of Angular.                                                     CO4
    (n)  What is dependency injection?                                                CO4

UNIT – I

2.  (a)  What are the basic components of a web                                      (7M)   CO1
         development framework? Describe each
         component in detail.
    (b)  How to create a Node Packaged Module and                                    (7M)   CO1
         then use that module as a library in a Node.js
         application. Explain with an example.

## (OR)

3. (a) How to create our own custom events and implementing listener callbacks that get implemented when an event is emitted in Node. (7M) CO1

   (b) Explain Request, Response and Server Objects in detail. (7M) CO1

## UNIT – II

4. (a) How to manage collections within MongoDB database using MongoDB shell? Explain with examples. (7M) CO2

   (b) What objects are used in the MongoDB Node.js Driver? Explain briefly. (7M) CO2

## (OR)

5. (a) What are different ways to manipulate documents within collections in MongoDB database from Node.js? Explain with examples. (7M) CO2

   (b) Explain query object operators and options object options in MongoDB Node.js driver module. (7M) CO2

## UNIT – III

6. (a) What are the various ways to configure routes in Express? Explain with examples. (7M) CO3

   (b) How to implement a Template Engine in Express? Explain. (7M) CO3

## (OR)

7. (a) How to serve static files in Express? Explain with an example. (7M) CO3

   (b) What middleware are used for sending and receiving cookies in Express? Explain with code examples. (7M) CO3

## UNIT – IV

8. (a) Describe the basic Angular application creation with an example. (7M) CO4

   (b) How to build a template in Angular? Explain with examples. (7M) CO4

## (OR)

9. (a) How to implement pipes in Angular? Create custom pipe that filters out select words from a string. (7M) CO4

   (b) What are different categories of Angular directives? Explain Attribute Directives with an example. (7M) CO4

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**ITH14 (R20)**

## B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular)

## ADVANCED DATA STRUCTURES

Time: Three hours

Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

   (a) What is dictionary ADT?                                                    CO2
   (b) Give an example for clustering problem in hashing.                          CO1
   (c) What is rehashing?                                                          CO1
   (d) What is a skiplist?                                                         CO2
   (e) Draw the binary search tree (BST) after the insertion                      CO2
       of the keys 50, 25, 29, 62, 22, 56, 16, 32 into an
       initially empty tree.                                                      CO3
   (f) How rebalancing is done in a height balanced tree?                         CO3
   (g) What is splaying?                                                          CO3
   (h) List the properties of a red-black tree.                                   CO3
   (i) Draw an example multi-way search tree.                                     CO3
   (j) Give any two applications for pattern matching.                            CO3
   (k) What is the longest prefix that is also the suffix of the                  CO4
       string "cgtacgttcgtacg"?
   (l) Write the looking glass heuristic for the following text                   CO5
       and pattern:T: course on ADS; P: ADS.
   (m) State the Longest Common Subsequence (LCS)                                 CO5
       problem.                                                                   CO4
   (n) What is a priority search tree?                                            CO4

### UNIT – I

2. (a) Discuss how to represent dictionaries.                          (7M)  CO2
   (b) Assume that a dictionary is implemented using                   (7M)  CO2
       an array. Describe how to perform insertion,
       deletion and search operations on it.

(OR)

3. (a) Following elements are inserted into an empty hash table with hash function $f(x) = x\%17$ and quadratic probing 20, 10, 5, 30, 40, 57, 35, 25, 18, 22, 21. Draw the hash table for each insertion. What is the load factor after last insertion? (7M) CO1

(b) Explain extendible hashing with a suitable example. (7M) CO1

### UNIT – II

4. (a) Explain how skiplist supports randomization. With suitable examples, describe the update operations of a skiplist. (7M) CO2

(b) Perform the following sequence of operations in an initially empty splay tree and draw the tree after each set of operations.
(i) Insert keys 12, 21, 4, 16, 38, 10 in this order.
(ii) Search for keys 1, 38, 15, 16, 13, 25 in this order. (7M) CO3

(OR)

5. (a) What are the different types of imbalances that occur while inserting a node into AVL tree? How they are rectified? (8M) CO3

(b) Rose claims that the order in which a fixed set of entries is inserted into an AVL tree does not matter-the same AVL tree results every time. Give a small example that proves she is wrong. (6M) CO3

### UNIT – III

6. (a) Will the root of red-black tree always be black after performing a delete operation? Justify with an example. (6M) CO3

(b) For each of the following statements about red-black trees, determine whether it is true or

false. If you think it is true, provide a justification. If you think it is false, give a counter example.
(i) A subtree of a red-black tree is itself a red-black tree.
(ii) Every red-black tree is an AVL tree. (8M) CO3

(OR)

7. Consider the set of keys
K = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}.
(i) Draw a (2, 4) tree storing K as its keys using the fewest number of nodes.
(ii) Draw a (2, 4) tree storing K as its keys using the maximum number of nodes. CO3

### UNIT – IV

8. (a) Draw a figure illustrating the comparisons done by the KMP pattern matching algorithm for the case when the text is "aaabaadaabaaa" and the pattern is "aabaaa". Do not count the comparisons made to compute the failure function. (7M) CO4

(b) Draw the compact representation of the suffix tree for the string "minimize minime". (7M) CO4

(OR)

9. (a) Construct a priority search tree for the following set of points, assuming a 16 X 16 bounding box:
{(1, 2), (4, 10), (14, 3), (6, 6), (3, 15), (2, 2), (3, 12), (9, 4), (12, 14)}. (8M) CO3

(b) Show the longest common subsequence table L for the two strings, X = "skullandbones" Y = "lullabybabies". What is the longest common subsequence between these strings? (7M) CO5

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