# CBCS SCHEME

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## Seventh Semester B.E. Degree Examination, Jan./Feb.2021
## Web Technology and Its Applications

Time: 3 hrs.                                                     Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. What are the 3 aims of HTML5? **(04 Marks)**
   b. Explain the need of cascade in CSS. Explain the 3 principles of cascade with suitable CSS script segments. **(08 Marks)**
   c. Explain two types of URL referencing techniques with suitable scripts in HTML5. **(08 Marks)**

**OR**

2  a. List and explain the different selectors available in CSS. **(08 Marks)**
   b. Discuss the HTML5 semantic structure elements. **(08 Marks)**
   c. List the different text properties with a description. **(04 Marks)**

### Module-2

3  a. Explain different form widgets created with the <input> tag. **(08 Marks)**
   b. Write HTML code for following table:

| Day | SEMIENAR | | |
|---|---|---|---|
| | SCHEDULE | | TEOPIC |
| | BEGIN | END | |
| MONDAY | 8:00 am | 5:00 pm | Introduction to XML |
| | | | Validity : DTD & NG |
| TUESDAY | 11:00 am | 2:00 pm | XPAT4 |
| | 11:00 am | 2:00 pm | XSL transformations |
| | 2:00 pm | 5:00 pm | |
| WEDNESDAY | 8:00 am | 5:00 pm | XSL Formatting Objects |

**(12 Marks)**

**OR**

4  a. Explain liquid layout design for websites with an example. List the fluid layout benefits and limitations. **(08 Marks)**
   b. Explain different ways of positioning elements in CSS layout techniques. **(08 Marks)**
   c. What are the importances of responsive design? Explain briefly. **(04 Marks)**

### Module-3

5  a. Write a Javascript code that displays text "CORONA VIRUS" with increasing font size in the interval of 100 ms in blue color, when font size reaches 50 pt in teal color and should stop. **(08 Marks)**
   b. Explain the advantages and disadvantages of client side scripting. **(06 Marks)**
   c. With suitable diagram, explain APACHE modules in PHP. **(06 Marks)**

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**OR**

6   a.   With suitable code segment, explain 2 approaches for event handling in Java script.

                                                           **(08 Marks)**

    b.   Write PHP program to greet the user based on time.                 **(08 Marks)**

    c.   Explain 2 methods in Java Script to access DOM nodes with examples.     **(04 Marks)**

## Module-4

7   a.   List and explain different superglobal arrays.                       **(08 Marks)**

    b.   Explain the different error handling methods, with suitable code segments.   **(08 Marks)**

    c.   How do you read or write file on server from PHP? Give example.       **(04 Marks)**

**OR**

8   a.   Write a PHP program to create a class Employee with the following specifications:

        Data members : Name, ID, Payment.

        Member function : Read (geTters) and write (setters)

        Use the above specification to read and print the information of 10 students.   **(08 Marks)**

    b.   Explain the support for inheritance in PHP with UML class diagram.     **(06 Marks)**

    c.   Explain 3 approaches to restrict file size in file upload with suitable code segments.

                                                           **(06 Marks)**

## Module-5

9   a.   Explain different types of caching used to improve performance of web application.

                                                             **(08 Marks)**

    b.   With suitable PHP script, explain loading and processing an XML document in Java script.

                                                           **(08 Marks)**

    c.   Explain creating and reading cookies with suitable PHP scripts.         **(04 Marks)**

**OR**

10   a.   Define AJAX. Expalin AJAX request by writing UML diagram.         **(08 Marks)**

    b.   Explain JavaScript pseudo-classes with examples.                **(08 Marks)**

    c.   Explain converting a JSON string to JSON object in JavaScript with suitable code segments.

                                                             **(04 Marks)**

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### Seventh Semester B.E. Degree Examination, Jan./Feb.2021
## Advanced Computer Architectures

Time: 3 hrs.                                              Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1   a.   With the help of block diagrams, explain Flynn's classification of computer architectures.
                                                                      **(10 Marks)**
    b.   Describe the shared-memory multiprocessor models.            **(10 Marks)**

**OR**

2   a.   Define the types of data dependence. Also compute the dependence graph for the following
         code segment:
         $S_1$ : Load R1, A
         $S_2$ : Add R2, R1
         $S_3$ : Move R1, R3
         $S_4$ : Store B, R1                                          **(10 Marks)**
    b.   Explain the characteristics of the following static connection networks :
         (i) Linear array.    (ii) Ring.    (iii) Binary tree.    (iv) Mesh.    **(10 Marks)**

### Module-2

3   a.   Distinguish between RISC and CISC processor architectures, with block diagrams.
                                                                      **(10 Marks)**
    b.   Explain VLIW processor architecture and its pipeline operations.    **(10 Marks)**

**OR**

4   a.   Compare the two virtual memory models for multiprocessor systems.    **(10 Marks)**
    b.   Illustrate four level memory hierarchy.                      **(04 Marks)**
    c.   Define the various page replacement policies.               **(06 Marks)**

### Module-3

5   a.   Illustrate daisy-chained and distributed arbitration techniques.    **(10 Marks)**
    b.   List the various Cache mapping schemes. Also explain any two schemes.    **(10 Marks)**

**OR**

6   a.   Consider the following pipeline reservation table:

Time →

| Stages | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| $S_1$ | X | | | | | | X |
| $S_2$ | | X | | X | | | |
| $S_3$ | | | X | | X | | |

   (i)    What are the forbidden latencies?
   (ii)   What is the initial collision vector?
   (iii)  Draw the state transition diagram
   (iv)   List all the simple cycles.
   (v)    List all the greedy cycles.
   (vi)   Determine the minimal average Latency.                     **(10 Marks)**
    b.   Explain the usage of prefetch buffers in instruction pipelining.    **(06 Marks)**
    c.   Illustrate internal data forwarding technique.               **(04 Marks)**

1 of 2

## Module-4

7 a. Define the two approaches of snoopy bus cache coherence protocol. Also write the state transition graphs for write through and write back cache. **(10 Marks)**

   b. Explain in detail, three types of cache directory protocols. **(10 Marks)**

### OR

8 a. Explain the flow control methods for resolving a collision between two packets requesting the same outgoing channel. **(10 Marks)**

   b. Distinguish between store-and-forward routing and wormhole routing schemes. **(04 Marks)**

   c. Define the various vector instruction types. **(06 Marks)**

## Module-5

9 a. Explain the mechanisms used for interprocess communication. **(06 Marks)**

   b. Describe the compilation phases in parallel code generation. **(08 Marks)**

   c. Explain the sole-access protocols used in synchronization. **(06 Marks)**

### OR

10 a. Explain the concept of recorder buffer as a processor element. **(06 Marks)**

   b. With the help of a block diagram, explain the role of reservation stations used in Tomasulo's algorithm. **(08 Marks)**

   c. Write and explain state transition diagram of 2 bit branch predictor. **(06 Marks)**

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs.                                                    Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1   a. Define machine learning. Mention five applications of machine learning. **(06 Marks)**
    b. Explain concept learning task with an example. **(06 Marks)**
    c. Apply candidate elimination algorithm and obtain the version space considering the training examples given Table Q1(c).

| Eyes | Nose | Head | Fcolor | Hair? | Smile?(TC) |
|------|------|------|--------|-------|------------|
| Round | Triangle | Round | Purple | Yes | Yes |
| Square | Square | Square | Green | Yes | No |
| Square | Triangle | Round | Yellow | Yes | Yes |
| Round | Triangle | Round | Green | No | No |
| Square | Square | Round | Yellow | Yes | Yes |

Table Q1(c)                                                    **(08 Marks)**

## OR

2   a. Explain the following with respect to designing a learning system :
       i)   Choosing the training experience
       ii)  Choosing the target function
       iii) Choosing a representation for the target function. **(09 Marks)**
    b. Write Find–S algorithm. Apply the Find–S for Table Q1(c) to find maximally specific hypothesis. **(06 Marks)**
    c. Explain the concept of inductive bias. **(05 Marks)**

## Module-2

3   a. Explain the concept of decision tree learning. Discuss the necessary measures required to select the attributed for building a decision tree using ID3 algorithm. **(11 Marks)**
    b. Explain the following with respect to decision tree learning :
       i)   Incorporating continuous valued attributes
       ii)  Alternative measures for selecting attributes
       iii) Handling training examples with missing attribute values. **(09 Marks)**

## OR

4   a. Construct decision tree using ID3 considering the following training examples :

| Weekend | Weather | Parental availability | Wealthy | Decision class |
|---------|---------|----------------------|---------|----------------|
| $H_1$ | Sunny | Yes | Rich | Cinema |
| $H_2$ | Sunny | No | Rich | Tennis |
| $H_3$ | Windy | Yes | Rich | Cinema |
| $H_4$ | Rainy | Yes | Poor | Cinema |
| $H_5$ | Rainy | No | Rich | Home |
| $H_6$ | Rainy | Yes | Poor | Cinema |
| $H_7$ | Windy | No | Poor | Cinema |
| $H_8$ | Windy | No | Rich | Shopping |
| $H_9$ | Windy | Yes | Rich | Cinema |
| $H_{10}$ | Sunny | No | Rich | Tennis |

Table Q4(b)                                                    **(12 Marks)**

    b. Discuss the issues of avoiding overfitting the data, and handling attributes with differing costs. **(08 Marks)**

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## Module-3

5  a. Discuss the application of neural network which is used to steer an autonomous vehicle.
   **(06 Marks)**
   b. Write Gradient descent algorithm to train a linear unit along with the derivation. **(08 Marks)**
   c. Discuss the issues of convergence, local minima and generalization, overfitting and stopping criterion. **(06 Marks)**

### OR

6  a. List the appropriate problems for neural network learning. **(05 Marks)**
   b. Define preceptron and discuss its training rule. **(05 Marks)**
   c. Show the derivation of back propagation training rule for output unit weights. **(10 Marks)**

## Module-4

7  a. Explain Bayes theorem and mention the features of Bayesian learning. **(07 Marks)**
   b. Prove that a maximum likelihood hypotheses cab be used to predict probabilities. **(08 Marks)**
   c. Explain Naïve Bayes classifier. **(05 Marks)**

### OR

8  a. Describe MAP learning algorithm. **(08 Marks)**
   b. Classify the test data and {Red, SUV, Domestic} using Naine Bayes classifier for the dataset shown in Table Q8(b).

| Color | Type | Origin | Stolen |
|-------|------|--------|--------|
| Red | Sports | Domestic | Yes |
| Red | Sports | Domestic | No |
| Red | Sports | Domestic | Yes |
| Yellow | Sports | Domestic | No |
| Yellow | Sports | Imported | Yes |
| Yellow | SUV | Imported | No |
| Yellow | SUV | Imported | Yes |
| Yellow | SUV | Domestic | No |
| Red | SUV | Imported | No |
| Red | Sports | Imported | Yes |

Table Q8(b) **(06 Marks)**

   c. Write and explain EM algorithm. **(06 Marks)**

## Module-5

9  a. Define :
   i)   Sample error
   ii)  True error
   iii) Confidence intervals. **(06 Marks)**
   b. Explain K-nearest neighbor learning algorithm. **(08 Marks)**
   c. Write a note no Q – learning. **(06 Marks)**

### OR

10 a. Define mean value, variance, standard deviation and estimation bias of a random variable.
   **(04 Marks)**
   b. Explain locally weighted linear regression and radial basis functions. **(10 Marks)**
   c. What is reinforcement learning? How it differs from other function approximation tasks?
   **(06 Marks)**

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Cloud Computing and Its Applications

Time: 3 hrs.                                                    Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1   a. Define cloud computing. With a neat diagram, explain major deployment models for cloud computing.                                                    **(08 Marks)**
    b. Explain cloud computing reference model with a neat diagram.         **(08 Marks)**
    c. Discuss major milestones which have lead to cloud computing.         **(04 Marks)**

### OR

2   a. Describe the characteristics of virtualized environments with the required diagrams.
                                                                           **(08 Marks)**
    b. With a neat diagram, explain Xen architecture and guest OS management.   **(06 Marks)**
    c. Explain live migration and server consolidation with a neat diagram.   **(06 Marks)**

## Module-2

3   a. Explain cloud computing architecture with a neat diagram.           **(08 Marks)**
    b. Discuss how SaaS provides access to application through the internet as a web based service.                                                        **(04 Marks)**
    c. Describe the various open challenges in clod computing.             **(08 Marks)**

### OR

4   a. Discuss the anatomy of Aneka container in detail.                   **(12 Marks)**
    b. Explain Aneka hybrid cloud deployment mode with a neat diagram.     **(08 Marks)**

## Module-3

5   a. What is a thread? Discuss different thread APIs.                     **(06 Marks)**
    b. With a neat diagram compare thread life cycle in system threading and Aneka threading.
                                                                           **(08 Marks)**
    c. Explain Aneka thread application model with a listing for application creation and configuration.                                                    **(06 Marks)**

### OR

6   a. Explain MPI reference scenario and MPI program structure with the required diagrams.
                                                                           **(08 Marks)**
    b. Explain task programming model with a neat diagram.                  **(06 Marks)**
    c. Discuss how workflows are managed in Aneka with required diagram.    **(06 Marks)**

## Module-4

7   a. What is data intensive computing? Explain Amazon dynamo architecture with a neat diagram.                                                           **(10 Marks)**
    b. Explain map reduce computation workflow with a neat diagram.         **(10 Marks)**

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**OR**

8  a. Discuss the variations and extensions of map reduce.                    (06 Marks)
   b. Describe Aneka map reduce infrastructure with a neat diagram.           (08 Marks)
   c. Discuss distributed life system support for execution of map reduce job with a neat diagram.
                                                                              (06 Marks)

## Module-5

9  a. Discuss the storage services provided by AWS.                          (12 Marks)
   b. Explain SQL Azure architecture with a neat diagram.                    (08 Marks)

**OR**

10 a. Describe how cloud computing can be applied to remote ECG monitoring with a required
      diagram.                                                                (10 Marks)
   b. Explain CRM and ERP implementations with three examples and the required diagrams.
                                                                              (10 Marks)

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## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Storage Area Networks

Time: 3 hrs.                                                    Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. Explain the key characteristics of Data centre with neat diagram.      (08 Marks)
   b. Explain the core elements of Data center.                              (04 Marks)
   c. Discuss the process of mapping user files to disk storage with neat diagram.  (08 Marks)

**OR**

2  a. Describe the concept of Mirroring and Parity.                          (04 Marks)
   b. What is RAID? Explain the RAID levels with reference to nested RAID, RAID 3 and RAID 5 with neat diagram.  (08 Marks)
   c. Discuss the components of an intelligent storage system with neat diagram.  (08 Marks)

### Module-2

3  a. List and explain different Fibre channel connectivity options with neat diagram.  (08 Marks)
   b. Define FCOE. Explain components of an FCOE network.                    (08 Marks)
   c. Define Zoning. Explain types of Zoning.                                (04 Marks)

**OR**

4  a. Discuss components of NAS with neat diagram.                           (06 Marks)
   b. List and explain benefits of NAS.                                      (06 Marks)
   c. Explain object storage and Retrival in OSD with diagram.              (08 Marks)

### Module-3

5  a. Define Business Continuity. Explain BC terminology in detail.          (06 Marks)
   b. Discuss different Backup Topologies.                                   (08 Marks)
   c. Explain the concept of Backup in virtualized Environments.            (06 Marks)

**OR**

6  a. Explain local Replication technology using Host based methods.         (08 Marks)
   b. Discuss synchronous + Asynchronous and Synchronous + Disk Buffered of three site replication.  (06 Marks)
   c. Explain the concept of Remote replication and migration in a Virtualized Environment.  (06 Marks)

### Module-4

7  a. Define Cloud Computing. List and explain the essential characteristics of cloud computing.  (08 Marks)
   b. List the cloud service models and discuss any two of them.            (08 Marks)
   c. List and explain benefits of cloud computing.                         (04 Marks)

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**OR**

8  a. Explain Cloud Deployment models in detail.     **(10 Marks)**
    b. Explain Cloud Computing infrastructure in detail.     **(10 Marks)**

## Module-5

9  a. List and explain the different types of security threats.     **(06 Marks)**
    b. Discus IPSAN CHAP protocol with neat diagram.     **(06 Marks)**
    c. Discuss security solutions for FC-SAN and NAS.     **(08 Marks)**

**OR**

10 a. List and describe storage infrastructure management activities.     **(04 Marks)**
    b. Explain Information lifecycle management with proper example.     **(08 Marks)**
     Discuss two methods of storage tiering.     **(08 Marks)**

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Web Technology and its Applications

Time: 3 hrs.

Max. Marks: 80

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. What is HTML? Explain the structure of HTML documents. (06 Marks)
   b. Explain the following HTML elements with example : i) images  ii) list. (04 Marks)
   c. Write the division <div> based HTML semantic structure elements. (06 Marks)

**OR**

2  a. Define CSS. Explain the location of styles. (08 Marks)
   b. Illustrate the CSS Box model besuge to label each of the components of the box. (04 Marks)
   c. What are class sectors and id selectors? (04 Marks)

### Module-2

3  a. Explain the basic table structure. Create an HTML document for the Fig.Q3(a). (06 Marks)

| ONE | TWO | |
|-----|-------|------|
|     | THREE | FOUR |

Fig.Q3(a)

   b. With the sample HTML form, explain how forms work. (06 Marks)
   c. List the various form-related HTML elements. (04 Marks)

**OR**

4  a. Explain positioning elements in CSS. (08 Marks)
   b. What is responsive design? Explain the four key components that make responsive design work. (08 Marks)

### Module-3

5  a. What is Javascript? Explain the advantages and disadvantages of client side scripting. (04 Marks)
   b. How Javascript can be linked to an HTML. (04 Marks)
   c. Briefly describe the document Object Model. (08 Marks)

**OR**

6  a. What are javascript events? Explain Event Handler approaches and Even Types. (08 Marks)
   b. Define PHP? Explain the PHP quote usage and concatenation approaches. (08 Marks)

### Module-4

7  a. Define Array. Briefly explain the array operations in PHP with example. (06 Marks)
   b. Illustrate how data will flow from HTML form to PHP $_GET and $_POST array. (06 Marks)
   c. Write a note on $_SERVER Array. (04 Marks)

**OR**

8  a. Define class. Describe the accessibility of a class member. (06 Marks)
   b. Explain three main error reporting flags. (06 Marks)
   c. Write a note on PHP error and exception handling. (04 Marks)

### Module-5

9  a. What are cookies? Explain how it works. (08 Marks)
   b. What is caching? Explain two basic strategies of caching web application. (08 Marks)

**OR**

10 a. Write a note on Arynchronous file transformation. (04 Marks)
   b. What is XML? Write the syntax rule for XML. (04 Marks)
   c. Describe how XML processing in PHP and Javascript. (08 Marks)

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## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Advanced Computer Architectures

Time: 3 hrs.  Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1 a. Describe with a neat diagram different shared memory multiprocessor models. **(09 Marks)**
  b. A 400 MHz processor was used to execute a program with the following instruction mix and clock cycle counts:

| Instruction Type | Instruction Count | Clock Cycle Count |
|---|---|---|
| Integer Arithmetic | 450000 | 1 |
| Data Transfer | 320000 | 2 |
| Floating Point | 150000 | 2 |
| Control Transfer | 80000 | 2 |

  Determine the effective CPI, MIPS rate and execution time for this program. **(07 Marks)**

**OR**

2 a. Explain the different types of data dependences. Draw the dependence graph for the following code segment:
  $S_1$ : Load $R_1$, A          /$R_1 \leftarrow$ Memory (A)/
  $S_2$ : Add $R_2$, $R_1$          /$R_2 \leftarrow (R_1) + (R_2)$/
  $S_3$ : Move $R_1$, $R_3$          /$R_1 \leftarrow (R_3)$/
  $S_4$ : Store B, $R_1$          /Memory(B) $\leftarrow (R_1)$/ **(08 Marks)**
  b. List the different types of static connection networks and explain any three in detail. **(08 Marks)**

### Module-2

3 a. Differentiate between CISC and RISC architecture. **(06 Marks)**
  b. Explain in detail Inclusion, coherence and Locality properties. **(10 Marks)**

**OR**

4 a. Explain with a neat diagram Hierarchical Memory Technology. **(08 Marks)**
  b. Explain the architecture of VLIW processor and its pipeline operation. **(08 Marks)**

### Module-3

5 a. What is arbitration? Describe central arbitration and distributed arbitration with relevant sketches. **(09 Marks)**
  b. Explain direct mapping cache organization. Mention its advantages and disadvantages. **(07 Marks)**

**OR**

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**6** a. Consider the following reservation table for a three-stage pipeline.

|       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|---|---|---|---|---|---|---|---|
| $S_1$ | X |   |   |   |   | X |   | X |
| $S_2$ |   | X |   | X |   |   |   |   |
| $S_3$ |   |   | X |   | X |   | X |   |

   (i)   What are the forbidden latencies and initial collision vector?
   (ii)  Draw the state transition diagram.
   (iii) List all simple cycles and greedy cycles.
   (iv)  Determine MAL.
   (v)   Determine the pipeline throughput. **(10 Marks)**

   b. List the different mechanisms for instruction pipelining. Explain any one in detail. **(06 Marks)**

## Module-4

**7** a. What is cache coherence problem? What are the different causes of cache inconsistencies? Explain n detail. **(10 Marks)**

   b. Explain store and forward routing and wormhole routing related to message routing. **(06 Marks)**

## OR

**8** a. Describe with relevant sketches three types of cache directory protocols. **(10 Marks)**

   b. Explain the context switching policies. **(06 Marks)**

## Module-5

**9** a. Explain synchronous message passing and asynchronous passing related to message passing model. **(08 Marks)**

   b. Explain object oriented programming model. **(08 Marks)**

## OR

**10** a. Explain the concept of operand forwarding with suitable example. **(08 Marks)**

   b. Describe in brief Tomasulo's algorithm. **(08 Marks)**

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs.  Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1 a. Define machine learning. Explain with specific examples. (06 Marks)
 b. How you will design a learning system? Explain with examples. (06 Marks)
 c. List and explain perspectives and issues in Machine Learning. (04 Marks)

### OR

2 a. Define concept learning. Explain the task of concept learning. (06 Marks)
 b. How the concept learning can be viewed as the task of searching? Explain. (04 Marks)
 c. Explain with examples:
    i) Find-S algorithm
    ii) Candidate Elimination algorithm (06 Marks)

### Module-2

3 a. Define decision tree learning. List and explain appropriate problems for decision tree learning. (06 Marks)
 b. Explain the basic decision tree learning algorithm. (05 Marks)
 c. Describe Hypothesis space search in decision tree learning. (05 Marks)

### OR

4 a. Define inductive bias. Explain inductive bias in decision tree learning. (06 Marks)
 b. Give the differences between the hypothesis space search in ID3 and candidate elimination algorithm. (04 Marks)
 c. List and explain issues in decision tree learning. (06 Marks)

### Module-3

5 a. Define Artificial neural networks. Explain biological learning systems. (05 Marks)
 b. Explain representations of Neural network. (05 Marks)
 c. Describe the characteristics of Back propagation algorithm. (06 Marks)

### OR

6 a. Define Perceptron. Explain representational power of Perceptrons. (05 Marks)
 b. Explain gradient descent algorithm. (06 Marks)
 c. Describe derivation of the back propagation rule. (05 Marks)

### Module-4

7 a. List and explain features of Bayesian learning methods. (06 Marks)
 b. Describe Brute-Force map learning algorithm. (05 Marks)
 c. Explain maximum likelihood and least-squared error hypothesis. (05 Marks)

**OR**

8   a. Describe maximum likelihood hypotheses for predicting probabilities. (05 Marks)
    b. Define Bayesian belief networks. Explain with an example. (06 Marks)
    c. Explain EM algorithm. (05 Marks)

## Module-5

9   a. Define the following with examples:
       i) Sample error   ii) True error   iii) Mean   iv) Variance. (08 Marks)
    b. Explain central limit Theorem. (04 Marks)
    c. Explain K-Nearest neighbor algorithm. (04 Marks)

**OR**

10  a. Explain case-based reasoning. (06 Marks)
    b. List and explain important differences of reinforcement algorithm with other function approximation tasks. (04 Marks)
    c. Explain Q Learning Algorithm. (06 Marks)

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### Seventh Semester B.E. Degree Examination, Jan./Feb.2021
## Web Technology and Its Applications

Time: 3 hrs.                                                      Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1  a. What are the 3 aims of HTML5? **(04 Marks)**
   b. Explain the need of cascade in CSS. Explain the 3 principles of cascade with suitable CSS script segments. **(08 Marks)**
   c. Explain two types of URL referencing techniques with suitable scripts in HTML5. **(08 Marks)**

**OR**

2  a. List and explain the different selectors available in CSS. **(08 Marks)**
   b. Discuss the HTML5 semantic structure elements. **(08 Marks)**
   c. List the different text properties with a description. **(04 Marks)**

## Module-2

3  a. Explain different form widgets created with the <input> tag. **(08 Marks)**
   b. Write HTML code for following table:

| Day | SEMIENAR | | |
|---|---|---|---|
| | SCHEDULE | | TEOPIC |
| | BEGIN | END | |
| MONDAY | 8:00 am | 5:00 pm | Introduction to XML |
| | | | Validity : DTD & NG |
| TUESDAY | 11:00 am | 2:00 pm | XPAT4 |
| | 11:00 am | 2:00 pm | |
| | 2:00 pm | 5:00 pm | XSL transformations |
| WEDNESDAY | 8:00 am | 5:00 pm | XSL Formatting Objects |

**(12 Marks)**

**OR**

4  a. Explain liquid layout design for websites with an example. List the fluid layout benefits and limitations. **(08 Marks)**
   b. Explain different ways of positioning elements in CSS layout techniques. **(08 Marks)**
   c. What are the importances of responsive design? Explain briefly. **(04 Marks)**

## Module-3

5  a. Write a Javascript code that displays text "CORONA VIRUS" with increasing font size in the interval of 100 ms in blue color, when font size reaches 50 pt in teal color and should stop. **(08 Marks)**
   b. Explain the advantages and disadvantages of client side scripting. **(06 Marks)**
   c. With suitable diagram, explain APACHE modules in PHP. **(06 Marks)**

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**OR**

6 a. With suitable code segment, explain 2 approaches for event handling in Java script.
(08 Marks)
   b. Write PHP program to greet the user based on time. (08 Marks)
   c. Explain 2 methods in Java Script to access DOM nodes with examples. (04 Marks)

## Module-4

7 a. List and explain different superglobal arrays. (08 Marks)
   b. Explain the different error handling methods, with suitable code segments. (08 Marks)
   c. How do you read or write file on server from PHP? Give example. (04 Marks)

**OR**

8 a. Write a PHP program to create a class Employee with the following specifications:
   Data members : Name, ID, Payment.
   Member function : Read (geTters) and write (setters)
   Use the above specification to read and print the information of 10 students. (08 Marks)
   b. Explain the support for inheritance in PHP with UML class diagram. (06 Marks)
   c. Explain 3 approaches to restrict file size in file upload with suitable code segments.
(06 Marks)

## Module-5

9 a. Explain different types of caching used to improve performance of web application.
(08 Marks)
   b. With suitable PHP script, explain loading and processing an XML document in Java script.
(08 Marks)
   c. Explain creating and reading cookies with suitable PHP scripts. (04 Marks)

**OR**

10 a. Define AJAX. Expalin AJAX request by writing UML diagram. (08 Marks)
   b. Explain JavaScript pseudo-classes with examples. (08 Marks)
   c. Explain converting a JSON string to JSON object in JavaScript with suitable code segments.
(04 Marks)

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USN | | | | | | | | | |                    17CS72

### Seventh Semester B.E. Degree Examination, Jan./Feb.2021
### Advanced Computer Architectures

Time: 3 hrs.                                    Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

#### Module-1

1  a. With the help of block diagrams, explain Flynn's classification of computer architectures.
                                                                            (10 Marks)
   b. Describe the shared-memory multiprocessor models.                     (10 Marks)

**OR**

2  a. Define the types of data dependence. Also compute the dependence graph for the following code segment:
   $S_1$ : Load R1, A
   $S_2$ : Add R2, R1
   $S_3$ : Move R1, R3
   $S_4$ : Store B, R1                                                       (10 Marks)
   b. Explain the characteristics of the following static connection networks :
   (i) Linear array.   (ii) Ring.   (iii) Binary tree.   (iv) Mesh.         (10 Marks)

#### Module-2

3  a. Distinguish between RISC and CISC processor architectures, with block diagrams.
                                                                            (10 Marks)
   b. Explain VLIW processor architecture and its pipeline operations.      (10 Marks)

**OR**

4  a. Compare the two virtual memory models for multiprocessor systems.     (10 Marks)
   b. Illustrate four level memory hierarchy.                               (04 Marks)
   c. Define the various page replacement policies.                         (06 Marks)

#### Module-3

5  a. Illustrate daisy-chained and distributed arbitration techniques.      (10 Marks)
   b. List the various Cache mapping schemes. Also explain any two schemes.  (10 Marks)

**OR**

6  a. Consider the following pipeline reservation table:

Time →

|        |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------|---|---|---|---|---|---|---|---|
|        | $S_1$ | X |   |   |   |   |   | X |
| Stages | $S_2$ |   | X |   | X |   |   |   |
|        | $S_3$ |   |   | X |   | X |   |   |

   (i)    What are the forbidden latencies?
   (ii)   What is the initial collision vector?
   (iii)  Draw the state transition diagram
   (iv)   List all the simple cycles.
   (v)    List all the greedy cycles.
   (vi)   Determine the minimal average Latency.                            (10 Marks)
   b. Explain the usage of prefetch buffers in instruction pipelining.      (06 Marks)
   c. Illustrate internal data forwarding technique.                        (04 Marks)

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## Module-4

7  a. Define the two approaches of snoopy bus cache coherence protocol. Also write the state transition graphs for write through and write back cache. **(10 Marks)**

   b. Explain in detail, three types of cache directory protocols. **(10 Marks)**

## OR

8  a. Explain the flow control methods for resolving a collision between two packets requesting the same outgoing channel. **(10 Marks)**

   b. Distinguish between store-and-forward routing and wormhole routing schemes. **(04 Marks)**

   c. Define the various vector instruction types. **(06 Marks)**

## Module-5

9  a. Explain the mechanisms used for interprocess communication. **(06 Marks)**

   b. Describe the compilation phases in parallel code generation. **(08 Marks)**

   c. Explain the sole-access protocols used in synchronization. **(06 Marks)**

## OR

10  a. Explain the concept of recorder buffer as a processor element. **(06 Marks)**

   b. With the help of a block diagram, explain the role of reservation stations used in Tomasulo's algorithm. **(08 Marks)**

   c. Write and explain state transition diagram of 2 bit branch predictor. **(06 Marks)**

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# CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs.                                                                                    Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1  a. Define machine learning. Mention five applications of machine learning. **(06 Marks)**
   b. Explain concept learning task with an example. **(06 Marks)**
   c. Apply candidate elimination algorithm and obtain the version space considering the training examples given Table Q1(c).

| Eyes | Nose | Head | Fcolor | Hair? | Smile?(TC) |
|------|------|------|--------|-------|------------|
| Round | Triangle | Round | Purple | Yes | Yes |
| Square | Square | Square | Green | Yes | No |
| Square | Triangle | Round | Yellow | Yes | Yes |
| Round | Triangle | Round | Green | No | No |
| Square | Square | Round | Yellow | Yes | Yes |

Table Q1(c)                                                                    **(08 Marks)**

## OR

2  a. Explain the following with respect to designing a learning system :
   i) Choosing the training experience
   ii) Choosing the target function
   iii) Choosing a representation for the target function. **(09 Marks)**
   b. Write Find–S algorithm. Apply the Find–S for Table Q1(c) to find maximally specific hypothesis. **(06 Marks)**
   c. Explain the concept of inductive bias. **(05 Marks)**

## Module-2

3  a. Explain the concept of decision tree learning. Discuss the necessary measures required to select the attributed for building a decision tree using ID3 algorithm. **(11 Marks)**
   b. Explain the following with respect to decision tree learning :
   i) Incorporating continuous valued attributes
   ii) Alternative measures for selecting attributes
   iii) Handling training examples with missing attribute values. **(09 Marks)**

## OR

4  a. Construct decision tree using ID3 considering the following training examples :

| Weekend | Weather | Parental availability | Wealthy | Decision class |
|---------|---------|----------------------|---------|----------------|
| $H_1$ | Sunny | Yes | Rich | Cinema |
| $H_2$ | Sunny | No | Rich | Tennis |
| $H_3$ | Windy | Yes | Rich | Cinema |
| $H_4$ | Rainy | Yes | Poor | Cinema |
| $H_5$ | Rainy | No | Rich | Home |
| $H_6$ | Rainy | Yes | Poor | Cinema |
| $H_7$ | Windy | No | Poor | Cinema |
| $H_8$ | Windy | No | Rich | Shopping |
| $H_9$ | Windy | Yes | Rich | Cinema |
| $H_{10}$ | Sunny | No | Rich | Tennis |

Table Q4(b)                                                                    **(12 Marks)**

   b. Discuss the issues of avoiding overfitting the data, and handling attributes with differing costs. **(08 Marks)**

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## Module-3

5 a. Discuss the application of neural network which is used to steer an autonomous vehicle. (06 Marks)

   b. Write Gradient descent algorithm to train a linear unit along with the derivation. (08 Marks)

   c. Discuss the issues of convergence, local minima and generalization, overfitting and stopping criterion. (06 Marks)

### OR

6 a. List the appropriate problems for neural network learning. (05 Marks)

   b. Define preceptron and discuss its training rule. (05 Marks)

   c. Show the derivation of back propagation training rule for output unit weights. (10 Marks)

## Module-4

7 a. Explain Bayes theorem and mention the features of Bayesian learning. (07 Marks)

   b. Prove that a maximum likelihood hypotheses cab be used to predict probabilities. (08 Marks)

   c. Explain Naïve Bayes classifier. (05 Marks)

### OR

8 a. Describe MAP learning algorithm. (08 Marks)

   b. Classify the test data and {Red, SUV, Domestic} using Naine Bayes classifier for the dataset shown in Table Q8(b).

| Color | Type | Origin | Stolen |
|-------|------|--------|--------|
| Red | Sports | Domestic | Yes |
| Red | Sports | Domestic | No |
| Red | Sports | Domestic | Yes |
| Yellow | Sports | Domestic | No |
| Yellow | Sports | Imported | Yes |
| Yellow | SUV | Imported | No |
| Yellow | SUV | Imported | Yes |
| Yellow | SUV | Domestic | No |
| Red | SUV | Imported | No |
| Red | Sports | Imported | Yes |

Table Q8(b) (06 Marks)

   c. Write and explain EM algorithm. (06 Marks)

## Module-5

9 a. Define :
   i) Sample error
   ii) True error
   iii) Confidence intervals. (06 Marks)

   b. Explain K-nearest neighbor learning algorithm. (08 Marks)

   c. Write a note no Q – learning. (06 Marks)

### OR

10 a. Define mean value, variance, standard deviation and estimation bias of a random variable. (04 Marks)

   b. Explain locally weighted linear regression and radial basis functions. (10 Marks)

   c. What is reinforcement learning? How it differs from other function approximation tasks? (06 Marks)

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USN | | | | | | | | | | |                     17CS742

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Cloud Computing and Its Applications

Time: 3 hrs.                                              Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. Define cloud computing. With a neat diagram, explain major deployment models for cloud computing. **(08 Marks)**
   b. Explain cloud computing reference model with a neat diagram. **(08 Marks)**
   c. Discuss major milestones which have lead to cloud computing. **(04 Marks)**

### OR

2  a. Describe the characteristics of virtualized environments with the required diagrams. **(08 Marks)**
   b. With a neat diagram, explain Xen architecture and guest OS management. **(06 Marks)**
   c. Explain live migration and server consolidation with a neat diagram. **(06 Marks)**

### Module-2

3  a. Explain cloud computing architecture with a neat diagram. **(08 Marks)**
   b. Discuss how SaaS provides access to application through the internet as a web based service. **(04 Marks)**
   c. Describe the various open challenges in clod computing. **(08 Marks)**

### OR

4  a. Discuss the anatomy of Aneka container in detail. **(12 Marks)**
   b. Explain Aneka hybrid cloud deployment mode with a neat diagram. **(08 Marks)**

### Module-3

5  a. What is a thread? Discuss different thread APIs. **(06 Marks)**
   b. With a neat diagram compare thread life cycle in system threading and Aneka threading. **(08 Marks)**
   c. Explain Aneka thread application model with a listing for application creation and configuration. **(06 Marks)**

### OR

6  a. Explain MPI reference scenario and MPI program structure with the required diagrams. **(08 Marks)**
   b. Explain task programming model with a neat diagram. **(06 Marks)**
   c. Discuss how workflows are managed in Aneka with required diagram. **(06 Marks)**

### Module-4

7  a. What is data intensive computing? Explain Amazon dynamo architecture with a neat diagram. **(10 Marks)**
   b. Explain map reduce computation workflow with a neat diagram. **(10 Marks)**

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**OR**

8  a. Discuss the variations and extensions of map reduce. (06 Marks)
   b. Describe Aneka map reduce infrastructure with a neat diagram. (08 Marks)
   c. Discuss distributed life system support for execution of map reduce job with a neat diagram. (06 Marks)

## Module-5

9  a. Discuss the storage services provided by AWS. (12 Marks)
   b. Explain SQL Azure architecture with a neat diagram. (08 Marks)

**OR**

10 a. Describe how cloud computing can be applied to remote ECG monitoring with a required diagram. (10 Marks)
   b. Explain CRM and ERP implementations with three examples and the required diagrams. (10 Marks)

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USN ☐☐☐☐☐☐☐☐☐☐ **17CS754**

### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Storage Area Networks

Time: 3 hrs.             Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

#### Module-1

1  a. Explain the key characteristics of Data centre with neat diagram.    (08 Marks)
   b. Explain the core elements of Data center.    (04 Marks)
   c. Discuss the process of mapping user files to disk storage with neat diagram.    (08 Marks)

#### OR

2  a. Describe the concept of Mirroring and Parity.    (04 Marks)
   b. What is RAID? Explain the RAID levels with reference to nested RAID, RAID 3 and RAID 5 with neat diagram.    (08 Marks)
   c. Discuss the components of an intelligent storage system with neat diagram.    (08 Marks)

#### Module-2

3  a. List and explain different Fibre channel connectivity options with neat diagram.    (08 Marks)
   b. Define FCOE. Explain components of an FCOE network.    (08 Marks)
   c. Define Zoning. Explain types of Zoning.    (04 Marks)

#### OR

4  a. Discuss components of NAS with neat diagram.    (06 Marks)
   b. List and explain benefits of NAS.    (06 Marks)
   c. Explain object storage and Retrival in OSD with diagram.    (08 Marks)

#### Module-3

5  a. Define Business Continuity. Explain BC terminology in detail.    (06 Marks)
   b. Discuss different Backup Topologies.    (08 Marks)
   c. Explain the concept of Backup in virtualized Environments.    (06 Marks)

#### OR

6  a. Explain local Replication technology using Host based methods.    (08 Marks)
   b. Discuss synchronous + Asynchronous and Synchronous + Disk Buffered of three site replication.    (06 Marks)
   c. Explain the concept of Remote replication and migration in a Virtualized Environment.    (06 Marks)

#### Module-4

7  a. Define Cloud Computing. List and explain the essential characteristics of cloud computing.    (08 Marks)
   b. List the cloud service models and discuss any two of them.    (08 Marks)
   c. List and explain benefits of cloud computing.    (04 Marks)

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**OR**

| | | | |
|---|---|---|---|
| 8 | a. | Explain Cloud Deployment models in detail. | (10 Marks) |
| | b. | Explain Cloud Computing infrastructure in detail. | (10 Marks) |

## Module-5

| | | | |
|---|---|---|---|
| 9 | a. | List and explain the different types of security threats. | (06 Marks) |
| | b. | Discus IPSAN CHAP protocol with neat diagram. | (06 Marks) |
| | c. | Discuss security solutions for FC-SAN and NAS. | (08 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 10 | a. | List and describe storage infrastructure management activities. | (04 Marks) |
| | b. | Explain Information lifecycle management with proper example. | (08 Marks) |
| | | Discuss two methods of storage tiering. | (08 Marks) |

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USN ☐☐☐☐☐☐☐☐☐☐      **15CS71**

### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
# Web Technology and its Applications

Time: 3 hrs.                                       Max. Marks: 80

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1   a.   What is HTML? Explain the structure of HTML documents.    (06 Marks)
    b.   Explain the following HTML elements with example : i) images   ii) list.    (04 Marks)
    c.   Write the division <div> based HTML semantic structure elements.    (06 Marks)

**OR**

2   a.   Define CSS. Explain the location of styles.    (08 Marks)
    b.   Illustrate the CSS Box model besuge to label each of the components of the box. (04 Marks)
    c.   What are class sectors and id selectors?    (04 Marks)

## Module-2

3   a.   Explain the basic table structure. Create an HTML document for the Fig.Q3(a).    (06 Marks)

Fig.Q3(a)

| ONE | TWO | |
|-----|-------|------|
| | THREE | FOUR |

    b.   With the sample HTML form, explain how forms work.    (06 Marks)
    c.   List the various form-related HTML elements.    (04 Marks)

**OR**

4   a.   Explain positioning elements in CSS.    (08 Marks)
    b.   What is responsive design? Explain the four key components that make responsive design work.    (08 Marks)

## Module-3

5   a.   What is Javascript? Explain the advantages and disadvantages of client side scripting.    (04 Marks)
    b.   How Javascript can be linked to an HTML.    (04 Marks)
    c.   Briefly describe the document Object Model.    (08 Marks)

**OR**

6   a.   What are javascript events? Explain Event Handler approaches and Even Types.    (08 Marks)
    b.   Define PHP? Explain the PHP quote usage and concatenation approaches.    (08 Marks)

## Module-4

7   a.   Define Array. Briefly explain the array operations in PHP with example.    (06 Marks)
    b.   Illustrate how data will flow from HTML form to PHP $_GET and $_POST array. (06 Marks)
    c.   Write a note on $_SERVER Array.    (04 Marks)

**OR**

8   a.   Define class. Describe the accessibility of a class member.    (06 Marks)
    b.   Explain three main error reporting flags.    (06 Marks)
    c.   Write a note on PHP error and exception handling.    (04 Marks)

## Module-5

9   a.   What are cookies? Explain how it works.    (08 Marks)
    b.   What is caching? Explain two basic strategies of caching web application.    (08 Marks)

**OR**

10   a.   Write a note on Arynchronous file transformation.    (04 Marks)
    b.   What is XML? Write the syntax rule for XML.    (04 Marks)
    c.   Describe how XML processing in PHP and Javascript.    (08 Marks)

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# CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

15CS72

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Advanced Computer Architectures

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1 a. Describe with a neat diagram different shared memory multiprocessor models. **(09 Marks)**

   b. A 400 MHz processor was used to execute a program with the following instruction mix and clock cycle counts:

| Instruction Type | Instruction Count | Clock Cycle Count |
|---|---|---|
| Integer Arithmetic | 450000 | 1 |
| Data Transfer | 320000 | 2 |
| Floating Point | 150000 | 2 |
| Control Transfer | 80000 | 2 |

Determine the effective CPI, MIPS rate and execution time for this program. **(07 Marks)**

**OR**

2 a. Explain the different types of data dependences. Draw the dependence graph for the following code segment:

   $S_1$ : Load $R_1$, A        /$R_1 \leftarrow$ Memory (A)/

   $S_2$ : Add $R_2$, $R_1$        /$R_2 \leftarrow (R_1) + (R_2)$

   $S_3$ : Move $R_1$, $R_3$        /$R_1 \leftarrow (R_3)$/

   $S_4$ : Store B, $R_1$        /Memory(B) $\leftarrow (R_1)$/        **(08 Marks)**

   b. List the different types of static connection networks and explain any three in detail. **(08 Marks)**

### Module-2

3 a. Differentiate between CISC and RISC architecture. **(06 Marks)**

   b. Explain in detail Inclusion, coherence and Locality properties. **(10 Marks)**

**OR**

4 a. Explain with a neat diagram Hierarchical Memory Technology. **(08 Marks)**

   b. Explain the architecture of VLIW processor and its pipeline operation. **(08 Marks)**

### Module-3

5 a. What is arbitration? Describe central arbitration and distributed arbitration with relevant sketches. **(09 Marks)**

   b. Explain direct mapping cache organization. Mention its advantages and disadvantages. **(07 Marks)**

**OR**

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6  a.  Consider the following reservation table for a three-stage pipeline.

|       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|---|---|---|---|---|---|---|---|
| $S_1$ | X |   |   |   |   | X |   | X |
| $S_2$ |   | X |   | X |   |   |   |   |
| $S_3$ |   |   | X |   | X |   | X |   |

     (i)   What are the forbidden latencies and initial collision vector?
     (ii)  Draw the state transition diagram.
     (iii) List all simple cycles and greedy cycles.
     (iv) Determine MAL.
     (v)  Determine the pipeline throughput.　　**(10 Marks)**

   b.  List the different mechanisms for instruction pipelining. Explain any one in detail. **(06 Marks)**

## Module-4

7  a.  What is cache coherence problem? What are the different causes of cache inconsistencies? Explain n detail.　　**(10 Marks)**

   b.  Explain store and forward routing and wormhole routing related to message routing.

　　　　　　　　　　　　　　　　　　　　　　　　　　　**(06 Marks)**

## OR

8  a.  Describe with relevant sketches three types of cache directory protocols.　**(10 Marks)**

   b.  Explain the context switching policies.　　**(06 Marks)**

## Module-5

9  a.  Explain synchronous message passing and asynchronous passing related to message passing model.　　**(08 Marks)**

   b.  Explain object oriented programming model.　　**(08 Marks)**

## OR

10  a.  Explain the concept of operand forwarding with suitable example.　　**(08 Marks)**

    b.  Describe in brief Tomasulo's algorithm.　　**(08 Marks)**

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# CBCS SCHEME

### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs. 　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1　a.　Define machine learning. Explain with specific examples. 　　　　　(06 Marks)
　　b.　How you will design a learning system? Explain with examples. 　　(06 Marks)
　　c.　List and explain perspectives and issues in Machine Learning. 　　(04 Marks)

### OR

2　a.　Define concept learning. Explain the task of concept learning. 　　(06 Marks)
　　b.　How the concept learning can be viewed as the task of searching? Explain. 　(04 Marks)
　　c.　Explain with examples:
　　　　i)　Find-S algorithm
　　　　ii)　Candidate Elimination algorithm 　　　　　　　　　　　　　(06 Marks)

### Module-2

3　a.　Define decision tree learning. List and explain appropriate problems for decision tree learning. 　　　　　　　　　　　　　　　　　　　　　　　　　(06 Marks)
　　b.　Explain the basic decision tree learning algorithm. 　　　　　　　(05 Marks)
　　c.　Describe Hypothesis space search in decision tree learning. 　　　(05 Marks)

### OR

4　a.　Define inductive bias. Explain inductive bias in decision tree learning. 　(06 Marks)
　　b.　Give the differences between the hypothesis space search in ID3 and candidate elimination algorithm. 　　　　　　　　　　　　　　　　　　　　　(04 Marks)
　　c.　List and explain issues in decision tree learning. 　　　　　　　　(06 Marks)

### Module-3

5　a.　Define Artificial neural networks. Explain biological learning systems. 　(05 Marks)
　　b.　Explain representations of Neural network. 　　　　　　　　　　　(05 Marks)
　　c.　Describe the characteristics of Back propagation algorithm. 　　　(06 Marks)

### OR

6　a.　Define Perceptron. Explain representational power of Perceptrons. 　(05 Marks)
　　b.　Explain gradient descent algorithm. 　　　　　　　　　　　　　　(06 Marks)
　　c.　Describe derivation of the back propagation rule. 　　　　　　　　(05 Marks)

### Module-4

7　a.　List and explain features of Bayesian learning methods. 　　　　　(06 Marks)
　　b.　Describe Brute-Force map learning algorithm. 　　　　　　　　　(05 Marks)
　　c.　Explain maximum likelihood and least-squared error hypothesis. 　(05 Marks)

**OR**

8  a. Describe maximum likelihood hypotheses for predicting probabilities.        (05 Marks)
   b. Define Bayesian belief networks. Explain with an example.        (06 Marks)
   c. Explain EM algorithm.        (05 Marks)

## Module-5

9  a. Define the following with examples:
   i) Sample error    ii) True error    iii) Mean    iv) Variance.        (08 Marks)
   b. Explain central limit Theorem.        (04 Marks)
   c. Explain K-Nearest neighbor algorithm.        (04 Marks)

**OR**

10  a. Explain case-based reasoning.        (06 Marks)
    b. List and explain important differences of reinforcement algorithm with other function approximation tasks.        (04 Marks)
    c. Explain Q Learning Algorithm.        (06 Marks)

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USN | | | | | | | | | |                                          **17CS71**

## Seventh Semester B.E. Degree Examination, Jan./Feb.2021
## Web Technology and Its Applications

Time: 3 hrs.                                                Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. What are the 3 aims of HTML5? **(04 Marks)**
   b. Explain the need of cascade in CSS. Explain the 3 principles of cascade with suitable CSS script segments. **(08 Marks)**
   c. Explain two types of URL referencing techniques with suitable scripts in HTML5. **(08 Marks)**

### OR

2  a. List and explain the different selectors available in CSS. **(08 Marks)**
   b. Discuss the HTML5 semantic structure elements. **(08 Marks)**
   c. List the different text properties with a description. **(04 Marks)**

### Module-2

3  a. Explain different form widgets created with the <input> tag. **(08 Marks)**
   b. Write HTML code for following table:

| Day | SEMIENAR | | |
|---|---|---|---|
| | SCHEDULE | | TEOPIC |
| | BEGIN | END | |
| MONDAY | 8:00 am | 5:00 pm | Introduction to XML |
| | | | Validity : DTD & NG |
| TUESDAY | 11:00 am | 2:00 pm | XPAT4 |
| | 11:00 am | 2:00 pm | |
| | 2:00 pm | 5:00 pm | XSL transformations |
| WEDNESDAY | 8:00 am | 5:00 pm | XSL Formatting Objects |

**(12 Marks)**

### OR

4  a. Explain liquid layout design for websites with an example. List the fluid layout benefits and limitations. **(08 Marks)**
   b. Explain different ways of positioning elements in CSS layout techniques. **(08 Marks)**
   c. What are the importances of responsive design? Explain briefly. **(04 Marks)**

### Module-3

5  a. Write a Javascript code that displays text "CORONA VIRUS" with increasing font size in the interval of 100 ms in blue color, when font size reaches 50 pt in teal color and should stop. **(08 Marks)**
   b. Explain the advantages and disadvantages of client side scripting. **(06 Marks)**
   c. With suitable diagram, explain APACHE modules in PHP. **(06 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**OR**

6  a.  With suitable code segment, explain 2 approaches for event handling in Java script.

(08 Marks)

   b.  Write PHP program to greet the user based on time. (08 Marks)

   c.  Explain 2 methods in Java Script to access DOM nodes with examples. (04 Marks)

## Module-4

7  a.  List and explain different superglobal arrays. (08 Marks)

   b.  Explain the different error handling methods, with suitable code segments. (08 Marks)

   c.  How do you read or write file on server from PHP? Give example. (04 Marks)

**OR**

8  a.  Write a PHP program to create a class Employee with the following specifications:
       Data members : Name, ID, Payment.
       Member function : Read (geTters) and write (setters)
       Use the above specification to read and print the information of 10 students. (08 Marks)

   b.  Explain the support for inheritance in PHP with UML class diagram. (06 Marks)

   c.  Explain 3 approaches to restrict file size in file upload with suitable code segments.

(06 Marks)

## Module-5

9  a.  Explain different types of caching used to improve performance of web application.

(08 Marks)

   b.  With suitable PHP script, explain loading and processing an XML document in Java script.

(08 Marks)

   c.  Explain creating and reading cookies with suitable PHP scripts. (04 Marks)

**OR**

10  a.  Define AJAX. Expalin AJAX request by writing UML diagram. (08 Marks)

    b.  Explain JavaScript pseudo-classes with examples. (08 Marks)

    c.  Explain converting a JSON string to JSON object in JavaScript with suitable code segments.

(04 Marks)

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### Seventh Semester B.E. Degree Examination, Jan./Feb.2021
## Advanced Computer Architectures

Time: 3 hrs.                                              Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a.  With the help of block diagrams, explain Flynn's classification of computer architectures.
                                                                      **(10 Marks)**
   b.  Describe the shared-memory multiprocessor models.              **(10 Marks)**

**OR**

2  a.  Define the types of data dependence. Also compute the dependence graph for the following code segment:
       $S_1$ : Load R1, A
       $S_2$ : Add R2, R1
       $S_3$ : Move R1, R3
       $S_4$ : Store B, R1                                            **(10 Marks)**
   b.  Explain the characteristics of the following static connection networks :
       (i) Linear array.    (ii) Ring.    (iii) Binary tree.    (iv) Mesh.    **(10 Marks)**

### Module-2

3  a.  Distinguish between RISC and CISC processor architectures, with block diagrams.
                                                                      **(10 Marks)**
   b.  Explain VLIW processor architecture and its pipeline operations.    **(10 Marks)**

**OR**

4  a.  Compare the two virtual memory models for multiprocessor systems.    **(10 Marks)**
   b.  Illustrate four level memory hierarchy.                        **(04 Marks)**
   c.  Define the various page replacement policies.                  **(06 Marks)**

### Module-3

5  a.  Illustrate daisy-chained and distributed arbitration techniques.    **(10 Marks)**
   b.  List the various Cache mapping schemes. Also explain any two schemes.    **(10 Marks)**

**OR**

6  a.  Consider the following pipeline reservation table:

Time →

|        |       | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------|-------|---|---|---|---|---|---|---|
|        | $S_1$ | X |   |   |   |   |   | X |
| Stages | $S_2$ |   | X |   | X |   |   |   |
|        | $S_3$ |   |   | X |   | X |   |   |

   (i)    What are the forbidden latencies?
   (ii)   What is the initial collision vector?
   (iii)  Draw the state transition diagram
   (iv)   List all the simple cycles.
   (v)    List all the greedy cycles.
   (vi)   Determine the minimal average Latency.                     **(10 Marks)**
   b.  Explain the usage of prefetch buffers in instruction pipelining.    **(06 Marks)**
   c.  Illustrate internal data forwarding technique.                **(04 Marks)**

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## Module-4

7  a.  Define the two approaches of snoopy bus cache coherence protocol. Also write the state transition graphs for write through and write back cache. **(10 Marks)**

   b.  Explain in detail, three types of cache directory protocols. **(10 Marks)**

### OR

8  a.  Explain the flow control methods for resolving a collision between two packets requesting the same outgoing channel. **(10 Marks)**

   b.  Distinguish between store-and-forward routing and wormhole routing schemes. **(04 Marks)**

   c.  Define the various vector instruction types. **(06 Marks)**

## Module-5

9  a.  Explain the mechanisms used for interprocess communication. **(06 Marks)**

   b.  Describe the compilation phases in parallel code generation. **(08 Marks)**

   c.  Explain the sole-access protocols used in synchronization. **(06 Marks)**

### OR

10 a.  Explain the concept of recorder buffer as a processor element. **(06 Marks)**

   b.  With the help of a block diagram, explain the role of reservation stations used in Tomasulo's algorithm. **(08 Marks)**

   c.  Write and explain state transition diagram of 2 bit branch predictor. **(06 Marks)**

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# CBCS SCHEME

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs. Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1  a. Define machine learning. Mention five applications of machine learning. **(06 Marks)**
   b. Explain concept learning task with an example. **(06 Marks)**
   c. Apply candidate elimination algorithm and obtain the version space considering the training examples given Table Q1(c).

| Eyes | Nose | Head | Fcolor | Hair? | Smile?(TC) |
|------|------|------|--------|-------|------------|
| Round | Triangle | Round | Purple | Yes | Yes |
| Square | Square | Square | Green | Yes | No |
| Square | Triangle | Round | Yellow | Yes | Yes |
| Round | Triangle | Round | Green | No | No |
| Square | Square | Round | Yellow | Yes | Yes |

Table Q1(c) **(08 Marks)**

## OR

2  a. Explain the following with respect to designing a learning system :
   i) Choosing the training experience
   ii) Choosing the target function
   iii) Choosing a representation for the target function. **(09 Marks)**
   b. Write Find–S algorithm. Apply the Find–S for Table Q1(c) to find maximally specific hypothesis. **(06 Marks)**
   c. Explain the concept of inductive bias. **(05 Marks)**

## Module-2

3  a. Explain the concept of decision tree learning. Discuss the necessary measures required to select the attributed for building a decision tree using ID3 algorithm. **(11 Marks)**
   b. Explain the following with respect to decision tree learning :
   i) Incorporating continuous valued attributes
   ii) Alternative measures for selecting attributes
   iii) Handling training examples with missing attribute values. **(09 Marks)**

## OR

4  a. Construct decision tree using ID3 considering the following training examples :

| Weekend | Weather | Parental availability | Wealthy | Decision class |
|---------|---------|-----------------------|---------|----------------|
| H1 | Sunny | Yes | Rich | Cinema |
| H2 | Sunny | No | Rich | Tennis |
| H3 | Windy | Yes | Rich | Cinema |
| H4 | Rainy | Yes | Poor | Cinema |
| H5 | Rainy | No | Rich | Home |
| H6 | Rainy | Yes | Poor | Cinema |
| H7 | Windy | No | Poor | Cinema |
| H8 | Windy | No | Rich | Shopping |
| H9 | Windy | Yes | Rich | Cinema |
| H10 | Sunny | No | Rich | Tennis |

Table Q4(b) **(12 Marks)**

   b. Discuss the issues of avoiding overfitting the data, and handling attributes with differing costs. **(08 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

## Module-3

5 a. Discuss the application of neural network which is used to steer an autonomous vehicle.
(06 Marks)

b. Write Gradient descent algorithm to train a linear unit along with the derivation. (08 Marks)

c. Discuss the issues of convergence, local minima and generalization, overfitting and stopping criterion. (06 Marks)

**OR**

6 a. List the appropriate problems for neural network learning. (05 Marks)

b. Define preceptron and discuss its training rule. (05 Marks)

c. Show the derivation of back propagation training rule for output unit weights. (10 Marks)

## Module-4

7 a. Explain Bayes theorem and mention the features of Bayesian learning. (07 Marks)

b. Prove that a maximum likelihood hypotheses cab be used to predict probabilities. (08 Marks)

c. Explain Naïve Bayes classifier. (05 Marks)

**OR**

8 a. Describe MAP learning algorithm. (08 Marks)

b. Classify the test data and {Red, SUV, Domestic} using Naine Bayes classifier for the dataset shown in Table Q8(b).

| Color | Type | Origin | Stolen |
|--------|--------|----------|--------|
| Red | Sports | Domestic | Yes |
| Red | Sports | Domestic | No |
| Red | Sports | Domestic | Yes |
| Yellow | Sports | Domestic | No |
| Yellow | Sports | Imported | Yes |
| Yellow | SUV | Imported | No |
| Yellow | SUV | Imported | Yes |
| Yellow | SUV | Domestic | No |
| Red | SUV | Imported | No |
| Red | Sports | Imported | Yes |

Table Q8(b)
(06 Marks)

c. Write and explain EM algorithm. (06 Marks)

## Module-5

9 a. Define :
   i) Sample error
   ii) True error
   iii) Confidence intervals. (06 Marks)

b. Explain K-nearest neighbor learning algorithm. (08 Marks)

c. Write a note no Q – learning. (06 Marks)

**OR**

10 a. Define mean value, variance, standard deviation and estimation bias of a random variable.
(04 Marks)

b. Explain locally weighted linear regression and radial basis functions. (10 Marks)

c. What is reinforcement learning? How it differs from other function approximation tasks?
(06 Marks)

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Cloud Computing and Its Applications

Time: 3 hrs.                                                    Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1   a.   Define cloud computing. With a neat diagram, explain major deployment models for cloud computing.   **(08 Marks)**
    b.   Explain cloud computing reference model with a neat diagram.   **(08 Marks)**
    c.   Discuss major milestones which have lead to cloud computing.   **(04 Marks)**

### OR

2   a.   Describe the characteristics of virtualized environments with the required diagrams.   **(08 Marks)**
    b.   With a neat diagram, explain Xen architecture and guest OS management.   **(06 Marks)**
    c.   Explain live migration and server consolidation with a neat diagram.   **(06 Marks)**

### Module-2

3   a.   Explain cloud computing architecture with a neat diagram.   **(08 Marks)**
    b.   Discuss how SaaS provides access to application through the internet as a web based service.   **(04 Marks)**
    c.   Describe the various open challenges in clod computing.   **(08 Marks)**

### OR

4   a.   Discuss the anatomy of Aneka container in detail.   **(12 Marks)**
    b.   Explain Aneka hybrid cloud deployment mode with a neat diagram.   **(08 Marks)**

### Module-3

5   a.   What is a thread? Discuss different thread APIs.   **(06 Marks)**
    b.   With a neat diagram compare thread life cycle in system threading and Aneka threading.   **(08 Marks)**
    c.   Explain Aneka thread application model with a listing for application creation and configuration.   **(06 Marks)**

### OR

6   a.   Explain MPI reference scenario and MPI program structure with the required diagrams.   **(08 Marks)**
    b.   Explain task programming model with a neat diagram.   **(06 Marks)**
    c.   Discuss how workflows are managed in Aneka with required diagram.   **(06 Marks)**

### Module-4

7   a.   What is data intensive computing? Explain Amazon dynamo architecture with a neat diagram.   **(10 Marks)**
    b.   Explain map reduce computation workflow with a neat diagram.   **(10 Marks)**

## OR

8   a.   Discuss the variations and extensions of map reduce.                                    (06 Marks)
    b.   Describe Aneka map reduce infrastructure with a neat diagram.                           (08 Marks)
    c.   Discuss distributed life system support for execution of map reduce job with a neat diagram.
                                                                                                 (06 Marks)

## Module-5

9   a.   Discuss the storage services provided by AWS.                                           (12 Marks)
    b.   Explain SQL Azure architecture with a neat diagram.                                     (08 Marks)

## OR

10  a.   Describe how cloud computing can be applied to remote ECG monitoring with a required diagram.                                                                                      (10 Marks)
    b.   Explain CRM and ERP implementations with three examples and the required diagrams.
                                                                                                 (10 Marks)

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Storage Area Networks

Time: 3 hrs.                                         Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

#### Module-1

1  a. Explain the key characteristics of Data centre with neat diagram.      (08 Marks)
   b. Explain the core elements of Data center.                               (04 Marks)
   c. Discuss the process of mapping user files to disk storage with neat diagram.  (08 Marks)

#### OR

2  a. Describe the concept of Mirroring and Parity.                          (04 Marks)
   b. What is RAID? Explain the RAID levels with reference to nested RAID, RAID 3 and RAID 5 with neat diagram.  (08 Marks)
   c. Discuss the components of an intelligent storage system with neat diagram.  (08 Marks)

#### Module-2

3  a. List and explain different Fibre channel connectivity options with neat diagram.  (08 Marks)
   b. Define FCOE. Explain components of an FCOE network.                    (08 Marks)
   c. Define Zoning. Explain types of Zoning.                                (04 Marks)

#### OR

4  a. Discuss components of NAS with neat diagram.                           (06 Marks)
   b. List and explain benefits of NAS.                                      (06 Marks)
   c. Explain object storage and Retrival in OSD with diagram.              (08 Marks)

#### Module-3

5  a. Define Business Continuity. Explain BC terminology in detail.          (06 Marks)
   b. Discuss different Backup Topologies.                                   (08 Marks)
   c. Explain the concept of Backup in virtualized Environments.            (06 Marks)

#### OR

6  a. Explain local Replication technology using Host based methods.         (08 Marks)
   b. Discuss synchronous + Asynchronous and Synchronous + Disk Buffered of three site replication.  (06 Marks)
   c. Explain the concept of Remote replication and migration in a Virtualized Environment.  (06 Marks)

#### Module-4

7  a. Define Cloud Computing. List and explain the essential characteristics of cloud computing.  (08 Marks)
   b. List the cloud service models and discuss any two of them.            (08 Marks)
   c. List and explain benefits of cloud computing.                         (04 Marks)

**OR**

| | | | |
|---|---|---|---|
| 8 | a. | Explain Cloud Deployment models in detail. | **(10 Marks)** |
| | b. | Explain Cloud Computing infrastructure in detail. | **(10 Marks)** |

## Module-5

| | | | |
|---|---|---|---|
| 9 | a. | List and explain the different types of security threats. | **(06 Marks)** |
| | b. | Discus IPSAN CHAP protocol with neat diagram. | **(06 Marks)** |
| | c. | Discuss security solutions for FC-SAN and NAS. | **(08 Marks)** |

**OR**

| | | | |
|---|---|---|---|
| 10 | a. | List and describe storage infrastructure management activities. | **(04 Marks)** |
| | b. | Explain Information lifecycle management with proper example. | **(08 Marks)** |
| | | Discuss two methods of storage tiering. | **(08 Marks)** |

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## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Web Technology and its Applications

Time: 3 hrs.                                              Max. Marks: 80

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

| | | | |
|---|---|---|---|
| 1 | a. | What is HTML? Explain the structure of HTML documents. | (06 Marks) |
| | b. | Explain the following HTML elements with example : i) images ii) list. | (04 Marks) |
| | c. | Write the division <div> based HTML semantic structure elements. | (06 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 2 | a. | Define CSS. Explain the location of styles. | (08 Marks) |
| | b. | Illustrate the CSS Box model besuge to label each of the components of the box. | (04 Marks) |
| | c. | What are class sectors and id selectors? | (04 Marks) |

### Module-2

| | | | |
|---|---|---|---|
| 3 | a. | Explain the basic table structure. Create an HTML document for the Fig.Q3(a). | (06 Marks) |

Fig.Q3(a)

| ONE | TWO | |
|---|---|---|
| | THREE | FOUR |

| | | | |
|---|---|---|---|
| | b. | With the sample HTML form, explain how forms work. | (06 Marks) |
| | c. | List the various form-related HTML elements. | (04 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 4 | a. | Explain positioning elements in CSS. | (08 Marks) |
| | b. | What is responsive design? Explain the four key components that make responsive design work. | (08 Marks) |

### Module-3

| | | | |
|---|---|---|---|
| 5 | a. | What is Javascript? Explain the advantages and disadvantages of client side scripting. | (04 Marks) |
| | b. | How Javascript can be linked to an HTML. | (04 Marks) |
| | c. | Briefly describe the document Object Model. | (08 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 6 | a. | What are javascript events? Explain Event Handler approaches and Even Types. | (08 Marks) |
| | b. | Define PHP? Explain the PHP quote usage and concatenation approaches. | (08 Marks) |

### Module-4

| | | | |
|---|---|---|---|
| 7 | a. | Define Array. Briefly explain the array operations in PHP with example. | (06 Marks) |
| | b. | Illustrate how data will flow from HTML form to PHP $_GET and $_POST array. | (06 Marks) |
| | c. | Write a note on $_SERVER Array. | (04 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 8 | a. | Define class. Describe the accessibility of a class member. | (06 Marks) |
| | b. | Explain three main error reporting flags. | (06 Marks) |
| | c. | Write a note on PHP error and exception handling. | (04 Marks) |

### Module-5

| | | | |
|---|---|---|---|
| 9 | a. | What are cookies? Explain how it works. | (08 Marks) |
| | b. | What is caching? Explain two basic strategies of caching web application. | (08 Marks) |

**OR**

| | | | |
|---|---|---|---|
| 10 | a. | Write a note on Arynchronous file transformation. | (04 Marks) |
| | b. | What is XML? Write the syntax rule for XML. | (04 Marks) |
| | c. | Describe how XML processing in PHP and Javascript. | (08 Marks) |

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Advanced Computer Architectures

Time: 3 hrs.                                                    Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1  a. Describe with a neat diagram different shared memory multiprocessor models.  **(09 Marks)**
   b. A 400 MHz processor was used to execute a program with the following instruction mix and clock cycle counts:

| Instruction Type | Instruction Count | Clock Cycle Count |
|---|---|---|
| Integer Arithmetic | 450000 | 1 |
| Data Transfer | 320000 | 2 |
| Floating Point | 150000 | 2 |
| Control Transfer | 80000 | 2 |

   Determine the effective CPI, MIPS rate and execution time for this program.  **(07 Marks)**

### OR

2  a. Explain the different types of data dependences. Draw the dependence graph for the following code segment:
   $S_1$ : Load $R_1$, A          /$R_1 \leftarrow$ Memory (A)/
   $S_2$ : Add $R_2$, $R_1$        /$R_2 \leftarrow (R_1) + (R_2)$/
   $S_3$ : Move $R_1$, $R_3$        /$R_1 \leftarrow (R_3)$/
   $S_4$ : Store B, $R_1$          /Memory(B) $\leftarrow (R_1)$/  **(08 Marks)**
   b. List the different types of static connection networks and explain any three in detail.  **(08 Marks)**

### Module-2

3  a. Differentiate between CISC and RISC architecture.  **(06 Marks)**
   b. Explain in detail Inclusion, coherence and Locality properties.  **(10 Marks)**

### OR

4  a. Explain with a neat diagram Hierarchical Memory Technology.  **(08 Marks)**
   b. Explain the architecture of VLIW processor and its pipeline operation.  **(08 Marks)**

### Module-3

5  a. What is arbitration? Describe central arbitration and distributed arbitration with relevant sketches.  **(09 Marks)**
   b. Explain direct mapping cache organization. Mention its advantages and disadvantages.  **(07 Marks)**

### OR

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6  a.  Consider the following reservation table for a three-stage pipeline.

|       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|---|---|---|---|---|---|---|---|
| $S_1$ | X |   |   |   |   | X |   | X |
| $S_2$ |   | X |   | X |   |   |   |   |
| $S_3$ |   |   | X |   | X |   | X |   |

   (i)    What are the forbidden latencies and initial collision vector?
   (ii)   Draw the state transition diagram.
   (iii)  List all simple cycles and greedy cycles.
   (iv)   Determine MAL.
   (v)    Determine the pipeline throughput.                                    (10 Marks)
   b.  List the different mechanisms for instruction pipelining. Explain any one in detail. (06 Marks)

## Module-4

7  a.  What is cache coherence problem? What are the different causes of cache inconsistencies? Explain n detail.                                                            (10 Marks)
   b.  Explain store and forward routing and wormhole routing related to message routing.
                                                                               (06 Marks)

## OR

8  a.  Describe with relevant sketches three types of cache directory protocols.    (10 Marks)
   b.  Explain the context switching policies.                                   (06 Marks)

## Module-5

9  a.  Explain synchronous message passing and asynchronous passing related to message passing model.                                                                       (08 Marks)
   b.  Explain object oriented programming model.                                (08 Marks)

## OR

10 a.  Explain the concept of operand forwarding with suitable example.          (08 Marks)
   b.  Describe in brief Tomasulo's algorithm.                                   (08 Marks)

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# CBCS SCHEME

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### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Machine Learning

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

## Module-1

1. a. Define machine learning. Explain with specific examples. (06 Marks)
   b. How you will design a learning system? Explain with examples. (06 Marks)
   c. List and explain perspectives and issues in Machine Learning. (04 Marks)

### OR

2. a. Define concept learning. Explain the task of concept learning. (06 Marks)
   b. How the concept learning can be viewed as the task of searching? Explain. (04 Marks)
   c. Explain with examples:
      i) Find-S algorithm
      ii) Candidate Elimination algorithm (06 Marks)

## Module-2

3. a. Define decision tree learning. List and explain appropriate problems for decision tree learning. (06 Marks)
   b. Explain the basic decision tree learning algorithm. (05 Marks)
   c. Describe Hypothesis space search in decision tree learning. (05 Marks)

### OR

4. a. Define inductive bias. Explain inductive bias in decision tree learning. (06 Marks)
   b. Give the differences between the hypothesis space search in ID3 and candidate elimination algorithm. (04 Marks)
   c. List and explain issues in decision tree learning. (06 Marks)

## Module-3

5. a. Define Artificial neural networks. Explain biological learning systems. (05 Marks)
   b. Explain representations of Neural network. (05 Marks)
   c. Describe the characteristics of Back propagation algorithm. (06 Marks)

### OR

6. a. Define Perceptron. Explain representational power of Perceptrons. (05 Marks)
   b. Explain gradient descent algorithm. (06 Marks)
   c. Describe derivation of the back propagation rule. (05 Marks)

## Module-4

7. a. List and explain features of Bayesian learning methods. (06 Marks)
   b. Describe Brute-Force map learning algorithm. (05 Marks)
   c. Explain maximum likelihood and least-squared error hypothesis. (05 Marks)

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**OR**

8  a.  Describe maximum likelihood hypotheses for predicting probabilities.    (05 Marks)
   b.  Define Bayesian belief networks. Explain with an example.    (06 Marks)
   c.  Explain EM algorithm.    (05 Marks)

## Module-5

9  a.  Define the following with examples:
       i) Sample error    ii) True error    iii) Mean    iv) Variance.    (08 Marks)
   b.  Explain central limit Theorem.    (04 Marks)
   c.  Explain K-Nearest neighbor algorithm.    (04 Marks)

**OR**

10  a.  Explain case-based reasoning.    (06 Marks)
    b.  List and explain important differences of reinforcement algorithm with other function approximation tasks.    (04 Marks)
    c.  Explain Q Learning Algorithm.    (06 Marks)

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