CBCS SCHEME

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Seventh Semester B.E. Degree Examination, Aug./Sept.2020
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. With example explain HTML syntax. (04 Marks)
  b. Discuss the structure of HTML documents. (06 Marks)
  c. Explain any six html elements. (06 Marks)

OR

2 a. What is CSS? Explain the benefits of CSS. (06 Marks)
  b. With example explain the location of styles. (06 Marks)
  c. Explain any two selectors with respect to CSS. (04 Marks)

Module-2

3 a. Discuss <table> element along with spanning rows and columns. (08 Marks)
  b. Explain the following concerned with forms:
    i)   Form structure
    ii)   Form control elements. (08 Marks)

OR

4 a. Explain the different ways of positioning elements in CSS layout technique. (08 Marks)
  b. Discuss fixed layout and liquid layout with example for each. (08 Marks)

Module-3

5 a. Bring out the features of java script and also explain client-side scripting. (04 Marks)
  b. Explain the following concerned with java script:
    i)   Comparison operator
    ii)   Logical operators
    iii) While loops. (06 Marks)
  c. Discuss arrays of java script. (06 Marks)

OR

6 a. With example PHP tags, PHP comments, data types and constants. (04 Marks)
  b. By giving syntax and example, explain if….else in PHP. (06 Marks)
  c. Explain functions in PHP. (06 Marks)

Module-4

7 a. Explain $_GET and $_POST hyperglobal arrays. (08 Marks)
  b. With syntax and example, explain PHP classes and objects. (08 Marks)

OR

8   a.   Explain the following with respect to PHP:
i)   Data encapsulation
ii)   Inheritance
iii)   Polymorphism. (09 Marks)
   b.   Discuss errors and exceptions of PHP. (05 Marks)

Module-5

9   a.   What in a cookie? Explain. (04 Marks)
   b.   Explain the following:
i)   Serialization
ii)   Session state. (06 Marks)
   c.   Explain different types of caching used to improve performance of web applications. (06 Marks)

OR

10   a.   Explain javascript pseudo-classes with examples. (08 Marks)
   b.   What is AJAX? Explain AJAX request by writing UML diagram. (08 Marks)

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Seventh Semester B.E. Degree Examination, Aug./Sept.2020
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. What is Machine Learning? Explain different perspectives and issues in machine learning.

(06 Marks)

  b. Explain the steps in designing a learning system.

(10 Marks)

OR

2 a. Describe the Candidate-Elimination algorithm. Explain its working, taking the enjoy sport concept and training instances given below:

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Clod	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Warm	Change	Yes

(10 Marks)

  b. Explain how to model inductive systems by their equivalent deductive systems for Candidate-Elimination Algorithm.

(06 Marks)

Module-2

3 a. Explain the concepts of entropy and information gain.

(06 Marks)

  b. Describe the ID3 algorithm for decision tree learning.

(10 Marks)

OR

4 a. Apply ID3 algorithm for constructing decision tree for the following training example.

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

(10 Marks)

  b. Explain the issues in decision tree learning.

(06 Marks)

Module-3

5 a. Explain appropriate problems for Neural Network Learning with its characteristics.
                                    (10 Marks)
     b. Explain the single perceptron with its learning algorithm.   (06 Marks)

OR

6 a. Explain Back Propagation algorithm.   (10 Marks)
     b. Explain the remarks of Back propagation algorithm.   (06 Marks)

Module-4

7 a. Explain Naïve Bayes classifier.   (10 Marks)
     b. Explain Bayesian Belief Networks.   (06 Marks)

OR

8 a. Explain EM algorithm.   (08 Marks)
     b. Explain the derivation of K-means algorithm.   (08 Marks)

Module-5

9 a. Explain K-nearest neighbor learning algorithm with example. (10 Marks)
     b. Explain case based reasoning with example.   (06 Marks)

OR

10   Write short note on:
     a. Q learning
     b. Radial basis function
     c. Locally weighted regression
     d. Sampling theory.   (16 Marks)

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15CS742

Seventh Semester B.E. Degree Examination, Aug./Sept. 2020
Cloud Computing 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. Briefly explain the core technologies that play an important role in the realization of cloud computing. (08 Marks)
   b. With a neat diagram, explain the VMWare cloud solution stack. (08 Marks)

OR

2 a. Explain the paravirtualization technique supported in xen along with its architecture. (06 Marks)
   b. Explain the characteristics of virtualized environment. (06 Marks)
   c. Briefly explain the different hardware virtualization techniques. (04 Marks)

Module-2

3 a. Briefly explain the different types of clouds. (08 Marks)
   b. With a neat diagram, explain the Infrastructure as a Service (IaaS) reference implementation. (08 Marks)

OR

4 a. Explain any two services hosted inside the Aneka container. (08 Marks)
   b. With a neat diagram, explain the Cloud Computing Architecture. (08 Marks)

Module-3

5 a. What is Task Programming Model? With a neat diagram, explain the task programming model scenario. (08 Marks)
   b. What is workflow? Explain the workflow technologies for designing and executing workflow based applications. (08 Marks)

OR

6 a. Explain MPI reference scenario. Discuss the MPI program structure, with neat diagram. (10 Marks)
   b. Explain domain decomposition and functional decomposition techniques for parallel computation. (06 Marks)

Module-4

7 a. Write short notes on
      i) Google File System (GFS)
      ii) Apache Cassandra
      iii) Amazon Simple Storage Service (S3) (09 Marks)
   b. With a neat diagram, explain Amazon dynamo Architecture. (07 Marks)

OR

8 a. Explain MapReduce programming model using MapReduce computation workflow.

(10 Marks)

b. With a neat diagram, explain Aneka MapReduce Data file format. (06 Marks)

Module-5

9 a. With a neat diagram, explain the Google AppEngine Platform Architecture. (10 Marks)

b. Explain the following :
   i) Dropbox   ii) Animoto. (06 Marks)

OR

10 a. With a neat diagram, Explain the core service of windows Azure platform used for building scalable applications. (12 Marks)

b. Explain CRM and ERP applications in the cloud. (04 Marks)

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Seventh Semester B.E. Degree Examination, Aug./Sept.2020
Storage Area Networks

Time: 3 hrs.   Max. Marks: 80

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

Module-1
1   a. Explain the key characteristics of a data center, with a neat diagram.   (08 Marks)
    b. With a neat diagram, explain the structure of read and write operations in cache.   (08 Marks)

OR

2   a. List the different RAID levels where parity technique has been adopted. Explain any three.   (10 Marks)
    b. Compare virtual and traditional storage provisioning.   (06 Marks)

Module-2
3   a. What is zoning? What are the advantages of zoning? Explain the various types of zoning.   (08 Marks)
    b. Write a note on iSCSI.   (08 Marks)

OR

4   a. Explain the fibre channel Protocol stack with neat figure.   (08 Marks)
    b. Explain I/O consolidation using FCoE.   (08 Marks)

Module-3
5   a. Define the following terminologies:
        i) MTBF   ii) RPO   iii) MTTR   iv) RTO.   (08 Marks)
    b. Describe the failure analysis in BC. Mention some important BC technology solutions.   (08 Marks)

OR

6   a. Explain backup and restore operations with neat diagram.   (08 Marks)
    b. Explain Backup in virtualized environments.   (08 Marks)

Module-4
7   a. Define cloud computing. List and explain the essential characteristics of cloud computing.   (06 Marks)
    b. Classify the deployment models in cloud computing. Explain any two.   (10 Marks)

OR

8   a. List and explain the challenges facing in cloud-computing.   (06 Marks)
    b. Explain cloud infrastructure layers, with diagram.   (10 Marks)

Module-5
9   a. Write a note on: i) Risk triad   ii) Threats   (08 Marks)
    b. Explain the concept of Kerberos with neat diagram.   (08 Marks)

OR

10 a. Discuss the IPSAN security implementation in storage networking.   (06 Marks)
    b. Explain the storage infrastructure management activities in detail with example.   (10 Marks)

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Eighth Semester B.E. Degree Examination, Aug./Sept.2020
Internet of Things and Technology

Time: 3 hrs.   Max. Marks: 80

Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.
ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Define IoT and discuss the Genesis of IoT in detail.   (04 Marks)
    b.   List out the difference between IT and OT networks and their various challenges.   (06 Marks)
    c.   List out the most significant challenges and problems that IoT is currently facing.
               (06 Marks)

2   a.   List and explain the defining characteristics of fog computing.   (06 Marks)
    b.   Explain the IoT reference model published by the IoTWF.   (10 Marks)

Module-2

3   a.   Define sensor and its characteristics.   (06 Marks)
    b.   List out the most useful classification scheme for the pragmatic application of sensors in a IoT network.   (10 Marks)

4   a.   Briefly describe about communication criteria.   (08 Marks)
    b.   What are the main topologies used for IoT connecting devices?   (08 Marks)

Module-3

5   a.   What are the key advantages of the IP suite for the IoT?   (10 Marks)
    b.   What are the points to be considered while comparing the transport of DLMS/COSEM over a cellular network versus an LLN deployment?   (06 Marks)

6   a.   Explain in detail COAP message format.   (08 Marks)
    b.   Explain Message Queuing Telemetry Transport (MQTT).   (08 Marks)

Module-4

7   a.   What are the ways IoT data is categorized? Explain in detail.   (06 Marks)
    b.   Discuss the following :
       (i)   Supervised learning
       (ii)   Unsupervised learning
       (iii) Neural Networks.   (10 Marks)

8   a.   Explain any two Big data analytics tools and technologies.   (10 Marks)
    b.   Explain Lambda Architecture in details.   (06 Marks)

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Module-5

9 a. What is Arduino? What are the advantages of Arduino? (06 Marks)
   b. How to install arduino software for the windows PCs? (10 Marks)

10 a. Distinguish between Raspberry Pi and Arduino. (04 Marks)
    b. Develop a python program which monitors a temperature of an engine using DS18B20 sensor and Raspberry Pi. (12 Marks)

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Eighth Semester B.E. Degree Examination, Aug./Sept.2020
Big Data Analytics

Time: 3 hrs. Max. Marks: 80

Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.
ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What are the various systems roles in an HDFS development? Explain with a neat diagram. **(08 Marks)**
   b. Explain with a neat diagram HDFS Block replication. **(08 Marks)**

2 a. Write the code for simple mapper script and simple reducer script. **(08 Marks)**
   b. With a neat diagram explain Apache Hadoop parallel mapReduce data flow. **(08 Marks)**

Module-2

3 a. Explain the two-step Apache Sqoop data import and export method. **(08 Marks)**
   b. With a neat diagram explain YARN Application frameworks. **(08 Marks)**

4 a. Explain the Apache Ambasi dashboard view of a Hadoop cluster. **(08 Marks)**
   b. How Basic Hadoop YARN administration is carried out? Explain. **(08 Marks)**

Module-3

5 a. List any ten different Business Intelligence applications and explain them in brief. **(08 Marks)**
   b. With a neat diagram explain Data warehousing architecture. **(08 Marks)**

6 a. How do you evaluate data mining results, explain with confusion matrix. **(08 Marks)**
   b. Explain with a neat diagram different types of graphs. **(08 Marks)**

Module-4

7 a. Explain with a data set how to construct the decision tree. **(08 Marks)**
   b. Using the data given in Dataset shown in Table Q7(b), create a regression model to predict the Test 2 from Test 1 score. Then predict the score for the one who got a 46 in Test 1.

Table Q7(b)

Test 1	Test 2
59	56
52	63
44	55
51	50
42	66
42	48
41	58
45	36
27	13
63	50
54	81
44	56
50	64
47	50

(08 Marks)

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8 a. What are the different design principles of artificial neural network? Explain. **(08 Marks)**

    b. Write the advantages and disadvantages of K-means algorithm. **(04 Marks)**

    c. How association rules are represented? **(04 Marks)**

Module-5

9 a. Explain with a neat diagram text mining process. **(08 Marks)**

    b. What are the advantages and disadvantages of Naïve-Baye's algorithm? **(04 Marks)**

    c. Explain with a neat diagram SVM model. **(04 Marks)**

10 a. Explain with a neat diagram web usage mining architecture. **(08 Marks)**

    b. List and explain the applications of social network analysis. **(08 Marks)**

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15CS832

Eighth Semester B.E. Degree Examination, Aug./Sept.2020
Modern Interface Design

Time: 3 hrs.   Max. Marks: 80

Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.
ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Define HCI. Explain in detail, the importance of good design.   (08 Marks)
    b. Explain the various characteristics of Direct Manipulation.   (08 Marks)

2   a. Define Interaction Style. Explain various types of interaction styles in graphical systems.
                                                                                         (08 Marks)
    b. Explain the design goals in creating User Interface Design.   (08 Marks)

Module-2

3   a. How obstacles and Pitfalls can be eliminated in User Interface Design Process?   (08 Marks)
    b. Define Usability. Explain five Quality Components and dimensions of Usability.   (08 Marks)

4   a. Explain Direct and Indirect Methods in Information Collection.   (08 Marks)
    b. List the Interface Design Goals. Explain in detail, functions of Menus.   (08 Marks)

Module-3

5   a. List the characteristics of windows. Explain in detail, components of windows.   (08 Marks)
    b. Explain various Window Management Schemes.   (08 Marks)

6   a. Explain the characteristics of Device Based Controls.   (08 Marks)
    b. Compare the various GUI Controls.   (08 Marks)

Module-4

7   a. Explain the importance of Combining Multimedia.   (08 Marks)
    b. List the characteristics of Icons. Explain types of disabilities.   (08 Marks)

8   a. Explain the four factors that contribute to bad design.   (08 Marks)
    b. Explain in detail, providing proper feedback to the user.   (08 Marks)

Module-5

9   a. Explain the purpose and importance of usability testing.   (08 Marks)
    b. Explain the various common visualization techniques.   (08 Marks)

10 a. Explain the various software testing tools.   (08 Marks)
    b. Explain the organizational guidelines in detail.   (08 Marks)

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Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Advanced Computer Architecture

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. With a neat diagram explain the elements of modern computer system. (08 Marks)
  b. Explain Flynn's classification of computer architecture. (08 Marks)

OR

2 a. Define data dependency. Explain different functions of data dependency with the help of dependency graph. (08 Marks)
  b. A 4 MHz processor was used to execute a benchmark program with the following instruction mix and clock cycle counts.

Instruction type	Instruction count	Cycles/instruction
Integer arithmetic	45000	1
Data transfer	32000	2
Floating point	15000	2
Control transfer	8000	2

  Determine the effective CPI, MIPS rate and execution time for this program. (08 Marks)

Module-2

3 a. Explain the architecture of VLIW processor and its pipeline operations. (08 Marks)
  b. Explain the inclusion property and locality of reference along with its types in multilevel memory hierarchy. (08 Marks)

OR

4 a. Explain page replacement policies with the help of an example. (08 Marks)
  b. Give the characteristics of symbolic processors. (08 Marks)

Module-3

5 a. Explain bus arbitration and its types in multiprocessor systems. (08 Marks)
  b. Explain any two mapping techniques. (08 Marks)

OR

6 a. Explain the following terms associated with cache and memory architecture:
   (i)   Low order memory interleaving
   (ii) Atomic v/s non-atomic memory
   (iii) Physical address cache vs virtual address cache
   (iv) Memory bandwidth and fault tolerance. (08 Marks)

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b. Consider the following pipelined processor within 3 stages this pipeline has total evaluation time of 8 clock cycles. All successor stages must be used after each clock cycle.

	0	1	2	3	4	5	6	7	8
S_1	X								X
S_2		X	X					X	
S_3				X					
S_4					X	X			
S_5							X	X	

(i) List the set of forbidden latencies between task initiations
(ii) Draw the state diagram which shows all possible latency cycles
(iii) List all greedy cycles
(iv) Value of MAL. (08 Marks)

Module-4

7 a. Explain hierarchical bus system with neat diagram. (08 Marks)
   b. Explain crossbar networks along with its advantages and limitations. (08 Marks)

OR

8 a. Explain snoopy protocols with its approaches. (08 Marks)
   b. Briefly explain message routing schemes. (08 Marks)

Module-5

9 a. Define parallel programming model. Explain any two models. (08 Marks)
   b. Mention branch prediction methods and explain. (08 Marks)

OR

10 a. With the help of a neat diagram explain compilation phases in code generator. (08 Marks)
   b. Explain different language features for parallelism. (08 Marks)

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Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Advanced Computer Architecture

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   b. Explain Flynn's classification of computer architecture. (08 Marks)

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OR

4 a. Explain page replacement policies with the help of an example. (08 Marks)
   b. Give the characteristics of symbolic processors. (08 Marks)

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   b. Explain any two mapping techniques. (08 Marks)

OR

6 a. Explain the following terms associated with cache and memory architecture:
      (i) Low order memory interleaving
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S_1	X								X
S_2		X	X					X	
S_3				X					
S_4					X	X			
S_5							X	X	

(i) List the set of forbidden latencies between task initiations
(ii) Draw the state diagram which shows all possible latency cycles
(iii) List all greedy cycles
(iv) Value of MAL. **(08 Marks)**

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7 a. Explain hierarchical bus system with neat diagram. **(08 Marks)**
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Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Advanced Computer Architecture

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. With a neat diagram explain the elements of modern computer system.   (08 Marks)
   b. Explain Flynn's classification of computer architecture.   (08 Marks)

OR

2 a. Define data dependency. Explain different functions of data dependency with the help of dependency graph.   (08 Marks)
   b. A 4 MHz processor was used to execute a benchmark program with the following instruction mix and clock cycle counts.

Instruction type	Instruction count	Cycles/instruction
Integer arithmetic	45000	1
Data transfer	32000	2
Floating point	15000	2
Control transfer	8000	2

Determine the effective CPI, MIPS rate and execution time for this program.   (08 Marks)

Module-2

3 a. Explain the architecture of VLIW processor and its pipeline operations.   (08 Marks)
   b. Explain the inclusion property and locality of reference along with its types in multilevel memory hierarchy.   (08 Marks)

OR

4 a. Explain page replacement policies with the help of an example.   (08 Marks)
   b. Give the characteristics of symbolic processors.   (08 Marks)

Module-3

5 a. Explain bus arbitration and its types in multiprocessor systems.   (08 Marks)
   b. Explain any two mapping techniques.   (08 Marks)

OR

6 a. Explain the following terms associated with cache and memory architecture:
     (i) Low order memory interleaving
     (ii) Atomic v/s non-atomic memory
     (iii) Physical address cache vs virtual address cache
     (iv) Memory bandwidth and fault tolerance.   (08 Marks)

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b. Consider the following pipelined processor within 3 stages this pipeline has total evaluation time of 8 clock cycles. All successor stages must be used after each clock cycle.

	0	1	2	3	4	5	6	7	8
S_1	X								X
S_2		X	X					X	
S_3				X					
S_4					X	X			
S_5							X	X	

(i) List the set of forbidden latencies between task initiations
(ii) Draw the state diagram which shows all possible latency cycles
(iii) List all greedy cycles
(iv) Value of MAL. (08 Marks)

Module-4

7 a. Explain hierarchical bus system with neat diagram. (08 Marks)
  b. Explain crossbar networks along with its advantages and limitations. (08 Marks)

OR

8 a. Explain snoopy protocols with its approaches. (08 Marks)
  b. Briefly explain message routing schemes. (08 Marks)

Module-5

9 a. Define parallel programming model. Explain any two models. (08 Marks)
  b. Mention branch prediction methods and explain. (08 Marks)

OR

10 a. With the help of a neat diagram explain compilation phases in code generator. (08 Marks)
   b. Explain different language features for parallelism. (08 Marks)

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USN | | | | | | | | | | | 15CS73

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
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. What do you mean by well-posed learning problem? Explain with example.   (04 Marks)
   b. Explain the various stages involved in designing a learning system in brief.   (08 Marks)
   c. Write Find_S algorithm and discuss the issues with the algorithm.   (04 Marks)

OR

2 a. List the issues in machine learning.   (04 Marks)
   b. Consider the given below training example which finds malignant tumors from MRI scans.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

   Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: Malignant is +ve, Benign is −ve).   (08 Marks)
   c. Explain the concept of inductive bias in brief.   (04 Marks)

Module-2

3 a. Discuss the two approaches to prevent over fitting the data.   (08 Marks)
   b. Consider the following set of training examples:

Instance	Classification	a_1	a_2
1	1	1	1
2	1	1	1
3	0	1	0
4	1	0	0
5	0	0	1
6	0	0	1

   (i) What is the entropy of this collection of training examples with respect to the target function classification?
   (ii) What is the information gain of a_2 relative to these training examples?   (08 Marks)

OR

4 a. Define decision tree. Construct the decision tree to represent the following Boolean functions:
   i) $A \wedge \neg B$ ii) $A \vee [B \wedge C]$ iii) A XOR B   (06 Marks)
   b. Write the ID3 algorithm.   (06 Marks)
   c. What do you mean by gain and entropy? How it is used to build the decision tree. (04 Marks)

Module-3

5 a. Define perceptron. Explain the concept of single perceptron with neat diagram. **(06 Marks)**

b. Explain the back propagation algorithm. Why is it not likely to be trapped in local minima? **(10 Marks)**

OR

6 a. List the appropriate problems for neural network learning. **(04 Marks)**

b. Discuss the perceptron training rule and delta rule that solves the learning problem of perceptron. **(08 Marks)**

c. Write a remark on representation of feed forward networks. **(04 Marks)**

Module-4

7 a. Explain Naïve Bayes classifier. **(08 Marks)**

b. Explain brute force MAP learning algorithm. **(08 Marks)**

OR

8 a. Discuss Minimum Description Length principle in brief. **(08 Marks)**

b. Explain Bayesian belief networks and conditional independence with example. **(08 Marks)**

Module-5

9 a. Define: (i) Simple Error (ii) True Error **(04 Marks)**

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

c. What is reinforcement learning? **(04 Marks)**

OR

10 a. Define expected value, variance, standard deviation and estimate bias of a random variable. **(04 Marks)**

b. Explain locally weighted linear regression. **(08 Marks)**

c. Write a note on Q-learning. **(04 Marks)**

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USN | | | | | | | | | | 15CS73

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
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.   What do you mean by well-posed learning problem? Explain with example.   (04 Marks)
    b.   Explain the various stages involved in designing a learning system in brief.   (08 Marks)
    c.   Write Find_S algorithm and discuss the issues with the algorithm.   (04 Marks)

OR

2   a.   List the issues in machine learning.   (04 Marks)
    b.   Consider the given below training example which finds malignant tumors from MRI scans.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: Malignant is +ve, Benign is –ve).   (08 Marks)
    c.   Explain the concept of inductive bias in brief.   (04 Marks)

Module-2

3   a.   Discuss the two approaches to prevent over fitting the data.   (08 Marks)
    b.   Consider the following set of training examples:

Instance	Classification	a_1	a_2
1	1	1	1
2	1	1	1
3	0	1	0
4	1	0	0
5	0	0	1
6	0	0	1

   (i)   What is the entropy of this collection of training examples with respect to the target function classification?
   (ii) What is the information gain of a_2 relative to these training examples?   (08 Marks)

OR

4   a.   Define decision tree. Construct the decision tree to represent the following Boolean functions:
       i) $A \wedge \neg B$ ii) $A \vee [B \wedge C]$ iii) A XOR B   (06 Marks)
    b.   Write the ID3 algorithm.   (06 Marks)
    c.   What do you mean by gain and entropy? How it is used to build the decision tree.   (04 Marks)

Module-3

5 a. Define perceptron. Explain the concept of single perceptron with neat diagram. **(06 Marks)**

b. Explain the back propagation algorithm. Why is it not likely to be trapped in local minima? **(10 Marks)**

OR

6 a. List the appropriate problems for neural network learning. **(04 Marks)**

b. Discuss the perceptron training rule and delta rule that solves the learning problem of perceptron. **(08 Marks)**

c. Write a remark on representation of feed forward networks. **(04 Marks)**

Module-4

7 a. Explain Naïve Bayes classifier. **(08 Marks)**

b. Explain brute force MAP learning algorithm. **(08 Marks)**

OR

8 a. Discuss Minimum Description Length principle in brief. **(08 Marks)**

b. Explain Bayesian belief networks and conditional independence with example. **(08 Marks)**

Module-5

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c. What is reinforcement learning? **(04 Marks)**

OR

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                                                                                       (10 Marks)

OR

6 a. List the appropriate problems for neural network learning.   (04 Marks)
   b. Discuss the perceptron training rule and delta rule that solves the learning problem of perceptron.   (08 Marks)
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Module-4

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OR

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