

# CBCS SCHEME

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15CS71

## Seventh Semester B.E. Degree Examination, Dec.2019/Jan.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. Explain the role of <ul> and <ol> HTML tags with syntax and examples. (06 Marks)
- b. Explain the need of 'cascade' in CSS. Illustrate three principles of cascade with suitable CSS script segments. (06 Marks)
- c. Explain class selector and pseudo selectors of CSS with relevant scripts. (04 Marks)

OR

- 2 a. Explain two types of URL referencing techniques with suitable scripts in HTML5. (04 Marks)
- b. Explain the role of the following semantic elements of HTML5 with syntax and script segments:  
(i) <nav> (ii) <section> (iii) <aside> (06 Marks)
- c. Explain the following CSS properties with suitable examples:  
(i) float (ii) position (iii) overflow. (06 Marks)

### Module-2

- 3 a. Compare radio and check box controls of HTML5 with examples. (06 Marks)
- b. Explain the structure of <form> element with an example. Illustrate the role of action and method attributes. (06 Marks)
- c. Explain the role of display and visibility properties in CSS with examples. (04 Marks)

OR

- 4 a. Explain different forms of text input controls with examples. (04 Marks)
- b. Explain the role of CSS position property. With suitable examples, explain absolute and relative positioning. (06 Marks)
- c. Explain liquid (fluid) layout design for websites with an example. List Liquid layout benefits and limitations. (06 Marks)

### Module-3

- 5 a. Explain three forms of linking JavaScript to HTML page with suitable code segments. (08 Marks)
- b. With suitable diagrams, explain PHP module in apache. Describe the role of apache threads in web application execution. (08 Marks)

OR

- 6 a. Explain two methods in JavaScript to access DOM nodes with examples. (04 Marks)
- b. Explain two approaches for event handling in Java Script with suitable code segments. (06 Marks)
- c. With relevant code segments, explain two approaches to embed PHP script in HTML. (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.

**Module-4**

- 7 a. With data flow diagrams, explain the role of PHP's \$\_GET and \$\_POST arrays. (08 Marks)  
b. Explain procedural error handling and object oriented exception handling with suitable code segments. (08 Marks)

OR

- 8 a. Explain the support for inheritance in PHP with UML class diagram. (08 Marks)  
b. Explain three approaches to restrict the file size in file upload with suitable code segments. (08 Marks)

**Module-5**

- 9 a. With suitable PHP scripts, explain creating and reading Cookies. (04 Marks)  
b. With suitable examples, explain four basic jQuery selectors. (06 Marks)  
c. With suitable script, explain loading and processing an XML document in JavaScript. (06 Marks)

OR

- 10 a. With suitable PHP scripts, explain checking session existence and accessing session state. (06 Marks)  
b. With suitable scripts, explain AJAX GET requests and POST requests. (06 Marks)  
c. With suitable code segments, explain converting a JSON string to JSON object in JavaScript and a PHP object in PHP. (04 Marks)

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# CBCS SCHEME

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1KSI6CSI15

15CS72

## 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 <sub>1</sub>	X								X
S <sub>2</sub>		X	X					X	
S <sub>3</sub>				X					
S <sub>4</sub>					X	X			
S <sub>5</sub>							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 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)  $A \text{ XOR } B$  (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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## Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 Natural Language Processing

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Define NLP. What makes NLP difficult? (08 Marks)  
 b. Explain transformational grammar with example. (08 Marks)

**OR**

- 2 a. Write a note on the following with example:  
 (i)  $\bar{X}$  theory (04 Marks)  
 (ii) Theta theory (06 Marks)  
 b. Explain Lexical Functional Grammar [LFG]. (06 Marks)  
 c. Write the c-structure and f-structure for the following sentence "she saw stars". Consider the CFG rules.  
 $S \rightarrow NP VP$   
 $VP \rightarrow V \{NP\} \{NP\} PP^* \{S'\}$   
 $PP \rightarrow P NP$   
 $NP \rightarrow Det N \{PP\}$   
 $S' \rightarrow comp S$  (06 Marks)

### Module-2

- 3 a. What is morphological parsing? Explain 2-level morphological model with an example. (08 Marks)  
 b. Comment on the validity of the following statements:  
 (i) Rule-based taggers are non-deterministic.  
 (ii) Stochastic taggers are language dependent (04 Marks)  
 c. Construct the parse tree for the sentence: "The girl plucked the flower with a long stick"  
 Discuss the ambiguity arises from the parse tree. (04 Marks)

**OR**

- 4 a. Explain Levenstein minimum edit distance algorithm. (08 Marks)  
 b. Compute minimum edit distance between peaceful and peaceful. (08 Marks)

### Module-3

- 5 a. Explain shortest dependency path hypothesis. Show various shortest dependency path among the relations in the "Jellisc created an atmosphere of terror in the camp by killing abusing and threatening the detainees". (08 Marks)  
 b. Explain how the relation patterns can be captured using string kernel. (08 Marks)

**OR**

- 6 a. Compute the common features between x and y, where x = "his actions in Brocko" and y = "his arrival in Beijing" (06 Marks)  
 b. Explain the strategies used in active learning approach for acquiring labels using committee based classification scheme. (10 Marks)

**Module-4**

- 7 a. Explain the semantically guided model for effective text mining. (08 Marks)  
b. Explain in detail the high-level representation approaches in text mining. (08 Marks)

OR

- 8 a. Define: (i) cohesion (ii) coh-matrix (iii) LSI (06 Marks)  
b. Write a note on various approaches to analyzing texts. (10 Marks)

**Module-5**

- 9 a. Explain design features of IR with a neat diagram. (08 Marks)  
b. How stemming affects the performance of IR systems? (04 Marks)  
c. "Stop words elimination may be harmful". Justify. (04 Marks)

OR

- 10 a. A user submitted a query to an IR system. Out of the 1<sup>st</sup> 15 documents returned by the system, those ranked 1, 2, 5, 8, 12 were relevant. Compute non-interpolated average precision for this retrieval. Assume there are six relevant documents. (06 Marks)  
b. Explain word net. List the applications of word net. (06 Marks)  
c. Write the hypernym chain for "RIVER" extracted from wordnet 2.0. (04 Marks)

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15CS743

## Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 Information and Network Security

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 crypto as a block box. (05 Marks)  
b. Using vernam cipher encrypt the Plaintext "heihilter" to cipher text and from Ciphertext to plaintext using the key  
110 101 110 101 111 100 000 101 110 000  
And the corresponding binary representation of letter as below table :

Letter	e	h	i	k	l	r	s	t
Binary	000	001	010	011	100	101	110	111

- c. Explain the taxonomy of cryptography. (05 Marks)

### OR

- 2 a. Write a brief note on double transposition with an example. (05 Marks)  
b. Explain the taxonomy of cryptanalysis. (06 Marks)  
c. Write a short notes on :  
i) Project VENONA  
ii) Codebook cipher. (05 Marks)

### Module-2

- 3 a. What is cryptographic hash function? What are the needs that cryptographic hash function must provide? (06 Marks)  
b. With a diagram, explain Tiger hash outer round and inner round for  $F_m$ . (06 Marks)  
c. What are the techniques used in information hiding? Explain. (04 Marks)

### OR

- 4 a. With a neat diagram, explain secret sharing in detail and its types. (08 Marks)  
b. With an example, explain HMAC function in detail. (08 Marks)

### Module-3

- 5 a. Explain different types of freshness mechanisms. (08 Marks)  
b. Explain the idea behind the dynamic password scheme. With a neat diagram, explain the example of dynamic password scheme. (08 Marks)

### OR

- 6 a. List and explain the stages and challenges of the protocol design. (06 Marks)  
b. With a neat diagram, explain the reflection attack against protocol – 3. (05 Marks)  
c. What are the typical AKE protocol goals? Explain. (05 Marks)

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**Module-4**

- 7 a. What are the reasons for cryptographic key with finite lifetime? What are the measures taken for choosing a key length? Explain. (08 Marks)
- b. With a neat diagram, explain generic unique key per transaction schemes and its types. (08 Marks)

**OR**

- 8 a. What are the various techniques that can be used to provide tamper resistance? Explain. (05 Marks)
- b. With a neat diagram, explain key storage risk zones. (06 Marks)
- c. With a neat diagram, explain identify-based public-key cryptography. (05 Marks)

**Module-5**

- 9 a. With a neat diagram, explain simple SSL handshake protocol description. (05 Marks)
- b. What are the serious problem with WEP management? (04 Marks)
- c. With a neat diagram, explain GSM authentication and encryption. (07 Marks)

**OR**

- 10 a. Explain the process of issuing eID card with a neat diagram. (06 Marks)
- b. What are the challenging tasks for key management for video broadcasting? (05 Marks)
- c. What are the potential security concern for file protection and Email? (05 Marks)

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15CS754

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.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 with neat diagram the Evolution of storage Architecture. (06 Marks)  
b. Discuss core Elements of Data center and key characteristics of Data center. (10 Marks)

OR

- 2 a. Describe with neat block diagram the components of Intelligent storage system. (08 Marks)  
b. With diagram explain different RAID Techniques. (08 Marks)

### Module-2

- 3 a. Explain with neat diagram the components of Fiber Channels (FC) storage Area Networks. (08 Marks)  
b. What is zoning? Explain its types. (08 Marks)

OR

- 4 a. Discuss different iSCSI Topologies with neat diagrams. (08 Marks)  
b. Write short notes on Fiber Channel Over Ethernet (FCOE). (08 Marks)

### Module-3

- 5 a. Discuss different back up Topologies. (08 Marks)  
b. What is data deduplication? Explain its implementation methods. (08 Marks)

OR

- 6 a. Explain local Replication technology using Host based methods. (06 Marks)  
b. Write a short notes on the following ;  
i) Three site Replications ii) Network based Remote Replication. (10 Marks)

### Module-4

- 7 a. Explain the characteristics of clouds computing. (04 Marks)  
b. Discuss cloud Deployment models. (06 Marks)  
c. Explain Cloud computing Infrastructure. (06 Marks)

OR

- 8 a. Discuss the steps involved in transitioning from classic data center to cloud computing Environment service. (08 Marks)  
b. Write a short notes on the following :  
i) Business drives for cloud computing  
ii) Cloud migration considerations. (08 Marks)

### Module-5

- 9 a. Explain the different types of security threats. (06 Marks)  
b. Discuss security solutions for FC – SAN and IP-SAN. (10 Marks)

OR

- 10 a. Explain the various information infrastructure components in classic and virtual Environments. (08 Marks)  
b. Write a short notes on the following :  
i) Information Life Cycle Management (ILM). ii) Storage Tiering. (08 Marks)

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