

# 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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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)

- 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.  
b. Explain crossbar networks along with its advantages and limitations.

(08 Marks)

(08 Marks)

OR

- 8 a. Explain snoopy protocols with its approaches.  
b. Briefly explain message routing schemes.

(08 Marks)

(08 Marks)

**Module-5**

- 9 a. Define parallel programming model. Explain any two models.  
b. Mention branch prediction methods and explain.

(08 Marks)

(08 Marks)

OR

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

(08 Marks)

(08 Marks)

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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)  $A \text{ XOR } B$  (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)

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**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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15CS744

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

## UNIX System Programming

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. List the differences between ANSI C and K&R(K & R)C. Discuss any two differences in detail. (08 Marks)
- b. What is the necessity of `sysconf()`, `pathconf()` and `fpathconf()` functions? Write a C/C++ programme to illustrate the same. (08 Marks)

OR

- 2 a. What is error status code? List and explain the meaning of any 4 error status codes. (06 Marks)
- b. List the common functions performed by UNIX APIs. (04 Marks)
- c. Write a C program to illustrate the following using C preprocessor symbols.
  - i) to check whether the compiler is ANSI C compliant
  - ii) to get the physical line number of a source file
  - iii) to get file name
  - iv) to get date and time. (06 Marks)

### Module-2

- 3 a. List any four differences between hardlink and soft link (symbolic link). (04 Marks)
- b. Find the actual file permission if `open()` is called to create a file `/usr/names.txt`. Assume default file permission is 0666 and `umask` of the calling process is : `umask(S_IWOTHIS - IXOTHIS IWGRP)`. (04 Marks)
- c. Discuss the working of 'lseek' system call. Explain all the parameters in detail. (08 Marks)

OR

- 4 a. Discuss how 'link' and 'unlink' system calls can be used to implement 'mv' command in UNIX. (06 Marks)
- b. Using suitable diagram show the process's FDT (File Descriptor Table), FT (File Table) IT (Incode Table) contents after the operation : "A process has opened 3 files – 'xyz' for read only, 'abc' for read write and 'abc' again for write only". Discuss the same in detail. (10 Marks)

### Module-3

- 5 a. Discuss how a C program is started and terminated in various ways along with suitable diagram. (10 Marks)
- b. Write a C program to avoid Zombie process by forking twice. (06 Marks)

OR

- 6 a. What is the use of 'setjmp' and 'longjmp' function? Write a C program to illustrate the same. (08 Marks)
- b. What is Job control? List the 3 forms of support needed for Job control. (05 Marks)
- c. Compare 'fork' and 'vfork' systemcall. (03 Marks)

**Module-4**

- 7 a. Define signal. Categorize the ways in which a process can handle the signals. (05 Marks)  
b. Discuss the working of 'sigprocmask' API. Explain all the parameters in detail. (08 Marks)  
c. Mention any 3 Daemon characteristics. (03 Marks)

**OR**

- 8 a. Write a C program that checks whether SIGINT signal is present in a process signal mask and adds it to the mask if it is not there. It should clear SIGSEGV signal from the process signal mask. (08 Marks)  
b. Discuss how error logging is done by a Daemon process with suitable diagram. (08 Marks)

**Module-5**

- 9 a. Define IPC. List the IPC types supported in UNIX system. (05 Marks)  
b. How to create a pipe in UNIX programming? List the limitations of pipe. (04 Marks)  
c. Develop a code snippet that the parent sends "Hello world" message to the child process through the pipe. The child on receiving this message should display it on standard output. (07 Marks)

**OR**

- 10 a. Illustrate how FIFO is useful in client server communication. (08 Marks)  
b. Define message queue. Discuss how it is useful in inter-process communication. (08 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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15IS72

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

## Software Architecture and Design Patterns

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Define Design Pattern. Explain the four essential elements of pattern. (06 Marks)  
b. Explain, how design pattern help in specifying object implementations. (06 Marks)  
c. Write the advantages and disadvantages of delegation. (04 Marks)

OR

- 2 a. Describe the common causes of redesign along with the patterns that address them. (08 Marks)  
b. What is Object Oriented Development? Explain the key concepts of OOD. (06 Marks)  
c. Explain cohesion and coupling. (02 Marks)

### Module-2

- 3 a. Design the use case diagram of Library system and explain any two use case. (08 Marks)  
b. Define conceptual classes and relationships taking an example. (08 Marks)

OR

- 4 a. Explain the different questions need to be answered during design process. (06 Marks)  
b. Construct and explain the sequence diagram for returning books in Library System. (05 Marks)  
c. Briefly discuss Façade pattern with respect to design and implementation. (05 Marks)

### Module-3

- 5 a. Define structural patterns. Explain in detail the Adapter Pattern. (08 Marks)  
b. Explain the participants and consequences of Bridge Pattern. (04 Marks)  
c. Discuss the implementation steps of Bridge Pattern. (04 Marks)

OR

- 6 a. Explain the following with respect to the Composite pattern:  
i) Structure  
ii) Participants  
iii) Collaborations  
iv) Consequences (08 Marks)  
b. Briefly illustrate the Flyweight pattern in detail. (08 Marks)

### Module-4

- 7 a. What is Architectural Pattern? Explain the MVC pattern in detail. (08 Marks)  
b. Describe the process of designing the system in detail, taking a simple drawing program as example. (08 Marks)

**OR**

- 8 a. Explain the issues need to be highlighted, when implementing the Undo Operation. (05 Marks)  
b. Write a note on Drawing Incomplete Items. (05 Marks)  
c. What is Pattern Based Solution? Explain the characteristics of Architectural Pattern. (06 Marks)

**Module-5**

- 9 a. What are distributed systems? Explain the basic architecture of client/server system. (08 Marks)  
b. List and explain the steps to setup Remote Object System. (08 Marks)

**OR**

- 10 a. Draw and explain the State Transition Diagram for adding a book in Library System. (06 Marks)  
b. Draw and explain the Directory Structure for Servlets. (05 Marks)  
c. Write a short note on Input and Output. (05 Marks)

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