

69.a  
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EXAM SEAT NO: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

CSC1702 ADVANCE MICROPROCESSOR

FS BE IV (CSE)

wed.

Date: 13/11/2019

Time: 3:00 pm to 6:00 pm

Max Marks: 80

N.B.:

- Make suitable assumptions whenever required and mention clearly
- Write both sections in separate answer books
- Programs and instruction are to be written in assembly level language

### SECTION I

Q.1

- (a) Compare Intel Processors with ARM Processors. [5]
- (b) Describe the importance of contents of a segment register during protected mode operation. In protected mode, which information is available on the descriptor? [7]

Q.2

- (a) Explain the following assembler directives with suitable example. [5]
- LABEL
  - EQU
  - DQ

OR

- (a) i. What does PUSH instruction accomplish? [5]  
ii. What does WAIT instruction do?
- (b) Write a procedure in assembly language that generates Fibonacci series of the numbers. Write a main program which passes the number of elements to be generated in the above procedure. [7]

NB: First SIX elements of Fibonacci series are: 1, 1, 2, 3, 5, 8

Q.3

Attempt ANY FOUR

[16]

- (i) What is the address range for relative address programming?
- (ii) Give one example each for following addressing mode:  
Register Relative addressing, Base Relative-Plus-Index addressing, Register Indirect addressing
- (iii) What is the flat mode memory system?
- (iv) What does INT21H accomplish, if AH contains 4CH? Give an example to illustrate segment override prefix.
- (v) Whenever an interrupt is acknowledged, which flags are cleared? Why?

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SECTION II

Q.4

- (a) Design 8086 based system to interface 512K bytes of SRAM with starting address 80000H and 512K bytes of EPROM with ending address 8FFFFH. Assume- de-multiplexed address and data lines are available and clock generator is available. [6]
- (b) How much time is allowed for memory access when the 8086/8088 is operated with a 5 MHz clock? What should be done if memory is slower? [5]
- (c) Discuss internal registers of the DMA controller. [5]

Q.5

Answer ANY SIX:

[24]

- (i) Explain the function of following pins of IC 8284A:
- $\overline{E}FI$  and  $F/\overline{C}$
  - PCLK and OSC
- (ii) Discuss EDO memory and DDR memory.
- (iii) Discuss two methods available for memory selection.
- (iv) Compare memory mapped I/O system with an isolated I/O system?
- (v) How many interrupts IC 8259 can handle? What is an OCW? What is an ICW?
- (vi) The 82C55 has how many programmable I/O pin connections? What is special about port C of the 82C55?
- (vii) i) Which group of pins is used during bi-directional operation of IC 82C55?  
ii) For mode 1 input operation of the 82C55, what does the STB line do?

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35-02  
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Slip No. : 1

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA  
F.S. OF BE-IV (CSE)

Examination Day: **Thursday**

Date: **15/12/2022**

Time: **3.00 PM to 6:00 PM**

Subject: **ARTIFICIAL INTELLIGENCE(CSE1703)**

**Maximum Marks: 80**

**Note:**

- Write answer of each section in separate answer books.
- This paper contains two sections of 40 marks each.

**SECTION-I**

Q1 a) What is Artificial Intelligence? Explain state space problem with example. [7]

b) Consider the following initial and goal configuration for 8-puzzle problem. Draw the search tree. Apply A\* algorithm to reach from initial state to goal state and show the solution. Consider Manhattan distance as a heuristic function(i.e. sum of the distance that the tiles are out of the place.). [7]

Initial state

1	2	3
7	8	4
6	--	5

Goal state

1	2	3
8	--	4
7	6	5

Q2 a) Using Constraint satisfaction procedure solve the following crypt-arithmetic problem [7]

$$\begin{array}{r} \text{LOGIC} \\ + \text{LOGIC} \\ \hline \text{PROLOG} \end{array}$$

b) Explain hill climbing algorithm? Discuss its disadvantage and how to overcome it. [6]

**OR**

b) Explain Genetic algorithm with example. [6]

Q3 a) Discuss Iterative Deepening Search. Also give one example to explain. [7]

b) Explain the Best-first search algorithm with example. [6]

**OR**

b) Explain BFS and DFS algorithm with example. [6]

P. T. O.

35 b  
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Slip No. : 2

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F.S. OF BE-IV (CSE)

Examination Day: **Thursday**

Date: **15/12/2022**

Time: **3.00 PM to 6:00 PM**

Subject: **ARTIFICIAL INTELLIGENCE(CSE1703)**

**SECTION-II**

- Q4 a) Consider the following sentences [7]  
Tennis is a game. Chess is a game.  
John and Steve are students.  
John plays Tennis.  
Steve plays everything that John plays.  
Students who play Tennis, do not play Chess.
- i) Translate these sentences into predicate logic  
ii) Prove that: "Steve does not play Chess"
- b) Explain the difference between Forward and Backward Reasoning. [7]
- Q5 a) Write AO\* Algorithm? Use with suitable example how AO\* algorithm is used for problem reduction? [7]
- b) Explain conflict resolution with example. [6]
- OR**
- b) Discuss Goal stack planning with example. [6]
- Q6 a) Explain Branch and bound algorithm. Solve TSP problem using branch and bound algorithm. [7]
- b) Explain alpha-beta cut off search with an example. State a case when to do alpha pruning. [6]
- OR**
- b) Discuss Min-Max search method. [6]

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**  
**SS BE-IV (CSE) (2019) Examination (November 2022-23)**  
**Semester – VIII**  
**CSE1804: Cloud Computing**

Date: 29<sup>th</sup> November 2022 (Tuesday)

Marks: 80

Time: 03:00 PM to 06:00 PM

**Instructions:** Use separate answer sheet for different section. Give example(s) wherever required.

**SECTION – I**

- Q-1 Do as directed (ANY FIVE). [10]
- What is Cloud Computing? What are the benefits of Cloud Technology?
  - What is Virtual Machine, Guest OS, and Host OS?
  - Define the terms: elasticity and load balancing.
  - What is Docker?
  - Differentiate between the Private Cloud and Public Cloud.
  - What is Hypervisor (Virtual Machine Monitor)?
  - What is horizontal scale out?
- Q-2 Write a short note on following (ANY TWO): [10]  
 (A) Virtualization (B) XML (C) SLA
- Q-3 Attempt ANY TWO from the following. [20]
- Explain the SaaS, PaaS, and IaaS Service Models in detail with suitable example.
  - List the popular Cloud Service Providers and explain in brief different services provided by any one these Cloud Computing Platform.
  - Write a short note on Data Privacy and Security Issues in Cloud.

**SECTION – II**

- Q-4 Do as directed (ANY FIVE). [10]
- What is Green Cloud?
  - Write a short note on Open Stack.
  - List different Types of cloud deployments.
  - What is Fog Computing?
  - What is Sensor Cloud?
  - What is role of Broker for Cloud Marketplace?
  - Differentiate between authorization and authentication.
- Q-5 Write a short note on following (ANY TWO): [10]  
 (A) Fault Tolerance (B) MapReduce (C) Cloud Security
- Q-6 Attempt ANY TWO from the following. [20]
- What is Web Service? Explain the role of XML, SOAP, WSDL and UDDI in using Web Services.
  - Explain the Cost Benefit Analysis in switching to Cloud. Explain with suitable examples when it is economical to move on Cloud and when it is not economical.
  - Describe the architecture of Microsoft Azure.

Slip No. : CL

104-G  
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EXAM SEAT NO. : \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

F.S. of BE-IV ( Computer Sc. & Engg )

Examination

Day: Friday

Date: 15-11-2019

Year: 2019-20

Time: 3:00 pm to 6:00 pm

SUBJECT : COMPUTER NETWORKS (CSC1704)

Note : -- Answer to the two sections must be written in separate answer books.

Max Marks : 80

**Section - I**

Q-1. Answer the following in brief :

- a) State main features of packet-switching technique. [03]
- b) Wireless LANs implement the Acknowledged Connectionless service at the DLL as default. State True or False giving reason. [02]
- c) Define/Explain the following terms : [04]
  - i) Receiver Window
  - ii) Logical Address
  - iii) Frame
  - iv) Carrier Sensing
- d) Give the advantage and disadvantage of the Pipelining technique. [02]
- e) State main features of Fast Ethernet. [02]
- f) An 802.3 frame contains 15 bytes of data. What is the amount of padding used ? [01]

- Q-2. a) Explain the Bit-stuffing method of framing with an example and also state its advantages. [05]
- b) State the main features of 'Point-to-Point' transmission technology and what type of networks use it giving example. [03]
- c) Explain the term Pipelining. Describe the sliding window protocol with the go back 'n' strategy. [06]

**OR**

- Q-2. a) Explain the concept of Layers, Services, Interface and Protocols with respect to network architecture. [05]
- b) Write a brief note on : NIC [02]
- c) Describe briefly the PPP protocol used in the Internet at the DLL. [07]

Q-3. Attempt any two from the following : [12]

- a) Describe briefly the 802.11 Frame format.
- b) Explain the Hidden and Exposed Station problems and Describe briefly the MACA protocol used in wireless LANs.
- c) Describe briefly the 802.16 MAC Sublayer.

— P.T.O. —

Slip No. : 52

EXAM SEAT NO. : \_\_\_\_\_

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

F.S. of BE-IV ( Computer Sc. & Engg )

Examination

Day : Friday

Date : 15-11-2019

Year : 2019-20

Time : 3:00 pm to 6:00 pm

SUBJECT : COMPUTER NETWORKS ( CSC1704 )

**Section – II**

Q-4. Answer the following :

- a) Define / Explain the following terms : [04]  
i) Symmetric connection release ii) Optimality Principle  
iii) Source quench packet iv) Echo packet
- b) The address consisting of \_\_\_\_\_ is used as a Broadcast Address. [01]
- c) The maximum machines that can be assigned to a class C network is \_\_\_\_\_. [01]
- d) Explain the concept of initial connection protocol and process server with respect to TCP. [03]
- e) State the function of the ARP protocol and give its significance. [02]
- f) State main features of DNS and explain briefly how it is used. [03]

- Q-5. a) Describe briefly IPv4 protocol header. [06]  
b) Describe briefly Transparent fragmentation giving its advantages/drawbacks. [04]  
c) Explain briefly the DHCP protocol. [04]

**OR**

- Q-5. a) Explain Congestion. List various approaches to congestion control. Describe briefly two of the Reactive approaches. [06]  
b) Explain briefly various attributes desirable in a routing algorithm. [04]  
c) Explain the term 'Overprovisioning' giving its advantages/drawbacks. [04]  
List various issues that must be addressed to ensure Quality of Service.

Q-6. Attempt **any two** from the following : [12]

- a) Draw the TCP Segment Header and explain the purpose of various one-bit flags.  
b) Explain connectionless service and its significance. Describe briefly the UDP protocol.  
c) Explain briefly the TCP service model.

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The Maharaja Sayajirao University of Baroda

Semester: FSBE-III  
Subject: Computer Organization  
Subject Code: CSE1503

Date: 19<sup>th</sup> Dec 2022 *Monday*  
Max Marks: 80  
Time: 3:00-6:00 pm

**Section-A**

**Ques 1.** Design a circuit for a  $4 \times 4$  First In First Out Buffer and explain its functionality  
(8 marks)

**Ques 2. A.** With the help of a neat diagram explain the match logic for one word of associative memory.

**OR**

**B.** What are the various forms available for establishing an interconnection network in a multi-processor system?  
(8 marks)

**Ques 3.** Show the step-by-step multiplication process using Booth algorithm when the following binary numbers are multiplied.  $(+33) \times (-12)$   
(8 marks)

**Ques 4. A.** Does pipelining get affected by data dependencies among the instruction? Justify your answer with lucid examples.

**OR**

**B.** Compare and Contrast the Computer Design and Computer Architecture. (6 marks)

**Ques 5.** A digital computer has a memory unit of  $64K \times 16$  and a cache memory of 1K words.

The cache uses direct mapping with a block size of 4 words.

(a) How many bits are there in the tag, index, block and word fields of the address format?

(b) How many bits are there in each word of cache and how are they divided into function?

Include a valid bit.

(10 marks)

**Section-B**

**Ques 6. A.** Draw a space time diagram for six segment pipeline showing the time it takes to process eight tasks.

**OR**

**B.** Consider the multiplication of two  $40 \times 40$  matrices using a vector processor.

i) How many product terms are there in each inner product and how many inner products must be evaluated?

ii) How many multiply add operations are needed to calculate the product matrix?

(10 marks)

**Ques 7.** Show to construction of bus system with four registers and explain various functions used to select registers by bus.

(10 marks)

**Ques 8.** Discuss the role of micro program sequencer in reading and executing micro instruction.  
(10 marks)

**Ques 9.** Describe the hardware implementation and hardware algorithm for addition and subtraction of signed magnitude data with an example  
(10 marks)

— X —



45/10

Slip No:1

EXAM SEAT NO: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

SSBE III (Computer Science and Engineering)

CSC1607 PARALLEL PROCESSING

Date: 14/10/2019

Time: 3:00 to 6:00

Max Marks: 80

Monday

PM PM

N.B.: Make suitable assumptions whenever required and mention clearly

**SECTION I**

- Q.1 Discuss the data parallelism method for solving the problem in parallel. Also find out the necessary equation describing the speedup in the processing. [08]
- Q.2
- (a) Discuss the architecture and functionality of Pentium Processor. [08]
- (b) Discuss with example the delay due to data dependency in instruction level parallel processing. [08]

**OR**

- Q.2
- (a) Explain Branch Target Buffer method to reduce the delay due to branches. [08]
- (b) What do you mean by Super Scalar processing? - Explain with example. [08]
- Q.3 Attempt any TWO [16]
- (a) Mention the advantages and disadvantages of Temporal Parallelism method.
- (b) Explain VLIW processor.
- (c) Discuss the ideal conditions for pipelining of processing elements. Also discuss the non-ideal situations arise because of various practical reasons.

**SECTION II**

- Q.4 Discuss Amdahl's law. [08]
- Q.5
- (a) Discuss the concept of hardware multi-threading. [08]
- (b) How to achieve the synchronization of processes in Shared Memory computers? [08]
- Q.6 Attempt Any TWO [16]
- (a) Compare UMA and NUMA parallel computer structures.
- (b) What do we mean by Superlinear Speedup? Mention the possible situations when it becomes possible.
- (c) Discuss generalized structure of parallel computer. Also discuss the different variations based on different parameters.

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The Maharaja Sayajirao University of Baroda

Semester: SSBE-IV  
Subject: Computer Vision & Applications  
Subject Code: CSE1806

Date: 3<sup>rd</sup> Dec 2022  
Max Marks: 80  
Time: 3:00-6:00 pm

**Section A**

- Ques 1.** Explain the ways in which an image can be classified. (6marks)
- Ques 2.** What is temporal aliasing? Explain the methods to control temporal aliasing. (6marks)
- Ques 3.** Explain the need for interpolation techniques. What is the significance of Image entropy? (8 marks)
- Ques 4. A.** Derive the inverse scaling transformation matrix. (5 marks)  
**B.** What is the difference between 8-connectivity & m-connectivity? (5 marks)  
**C.** What is the role of data structures in imaging applications? (5 marks)  
**D.** Design a Gaussian mask for any two sigma values. (5 marks)

**Section B**

- Ques 5. A. a.** Show that KL transform is useful for reducing the dimensions of an image. (5marks)  
**b.** Apply DFT to the following sequence and verify whether it works:  
 $x = \{ 1 \ 2 \ 8 \ 9 \}$  (8 marks)
- Ques 6. A. a.** Design a Gaussian mask for any two sigma values. Differentiate between lossless and lossy compression. (7Marks)
- Ques 7. A. a.** What would be the effect of repeated application of histogram equalization to an image? Is this repeated operation helpful in any way? (5 Marks)  
**b.** Consider a one-dimensional image  $f(x)=60 \ 60 \ 60 \ 100 \ 100 \ 100$ . What are the first and second derivatives? (5 Marks)
- Ques 8. a.** What are the different ways in which the segmentation algorithms can be classified? (5 Marks)  
**b.** Explain in detail the stages of edge detection algorithms. (5 Marks)

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Slip No: 18.4

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F. S. B. E.-II (CSE)

Examination

Day: Monday Date: 11/11/2019 Year 2019 Time: 11:30 am to 2:30 pmSUBJECT: Data Structure (CSE1302)

Note: (1) Answer both the sections in separate answer books  
(2) Q1 and Q4 are compulsory.

Max. Marks: 80

**Section – I****Q.1 Answer the following questions:** [12]

- (a) Explain the relation between DS and algorithm.  
(b) Explain average case timing analysis for linear and binary search algorithm.  
(c) Write the output of the following with justification.  
int main() {  
    int a[2][4] = {4, 7, 10, 13, 16, 19, 22, 25};  
    count << (\*a[1]+2) << \*((a+1)+2) << 2[1[a]];  
    return 0; }
- (d) How many stacks are needed to implement a queue? Explain with example. Assume that no other data structure is available.

**Q.2 (a) Write an algorithm to convert an infix expression to postfix expression.** [07]

Show the working of the algorithm for the following expression.

 $A/B^C+D^*E-A^*C$ 

- (b) Write an algorithm to delete all the nodes at even positions and append it to end of the list. [07]

**OR****Q.2 (a) Write an algorithm to find the transpose of square matrix.** [05]

- (b) Write an algorithm to add two polynomials using linked list. Also show the memory representation of polynomial. [05]

- (c) Compare the average and worst time complexity of following sorting algorithms: Bubble sort, selection sort, merge sort and quick sort. [04]

**Q.3 (a) Sort the given values using radix sort.** [07]

11, -99, 22, -88, 33, -77, 44, -66, 55, 0, -1

- (b) Write a recursive algorithm for creating Fibonacci series of 'n' elements and show the steps of recursive function call and evaluation for n=5. [07]

**OR****Q.3 (a) Write an algorithm to implement output restricted dqueue.** [07]

- (b) Sort the given values using Quick Sort. [07]

42, 23, 74, 11, 65, 58, 94, 36, 99, 87

**Section – II****Q.4 Answer the following questions:** [12]

- (a) Explain the advantages of circular queue.  
(b) Explain threaded binary tree with its advantages and disadvantages.  
(c) Differentiate between spanning tree and minimal spanning tree.  
(d) Define the terms: Strict binary tree, priority queue, balance factor

**Q.5 (a) Given Inorder and preorder traversal, construct a binary tree and find Postorder traversal:** [06]

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F. S. B. E.-II (CSE)

Examination

Day: Monday Date: 11/11/2019 Year: 2019 Time: 11:30 am to 2:30 pm

SUBJECT: Data Structure (CSE1302)

Inorder : Y B K C F A G X E D H Z

Preorder : G B Y A C K F X D E Z H

- (b) Construct an AVL tree for the following data: [08]  
42, 06, 54, 62, 88, 50, 22, 32, 12, 33

OR

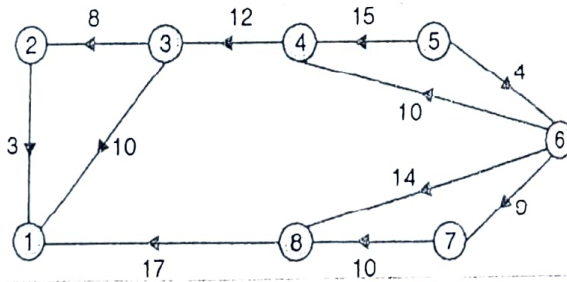
- Q.5 (a) Construct a binary search tree for the following data: [06]  
10, 3, 15, 22, 6, 45, 65, 23, 78, 34, 5

Also show the tree after each deletion of the node 3 and 45.

- (b) Explain the difference between B and B+ trees? Construct a B tree for [08]  
(78, 21, 14, 11, 97, 85, 74, 63, 45, 42, 57, 20, 16, 19, 32, 30, 31, 99) of the order 5. Also show the tree after deletion of 74 and 32.

- Q.6 (a) Explain Dijkstra's algorithm for shortest path with suitable example. [07]

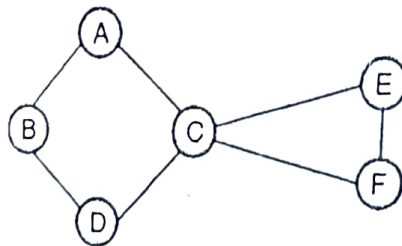
- (b) For the following graph obtain: [07]  
i) The in degree and out degree of each vertex,  
ii) Its adjacency matrix  
iii) Its adjacency list representation.



OR

- Q.6 (a) Create a min heap and Sort the following data using heap sort and show [07]  
heap at each step.  
132, 54, 96, 12, 28, 64, 53, 21, 46, 35, 9, 1

- (b) Consider the graph shown below. Find depth-first and breadth-first [07]  
traversals of this graph starting at A.



## THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

SSBE-II CSE

Examination

Day: Saturday Date: 12/10/2019 Year: 2019-20 Time: 03.00 to 06.00 PM

SUBJECT: CSC1404 Data Structure

PM,

- Instructions: 1) This paper contains two sections 40 marks each.  
 2) First question in each section is compulsory.  
 3) Figures to the right indicate full marks.

## SECTION-I

- Q-1 Perform step by step sorting of the following numbers: (20)  
 111 -999 222 -888 333 -777 444 -666 555 -111  
 using i) Selection Sort ii) Bubble Sort iii) Merge Sort iv) Quick Sort
- Q-2 Answer the following questions (Any two). (20)  
 (i) Write a program to implement stack as queue using two stacks.  
 (ii) Create a priority queue and perform its operations.  
 (iii) Write an algorithm for linear and binary search in array and compare its complexities.

## SECTION-II

- Q-3 From A to Z, for all even numbered alphabets (10)  
 (i) Create a Binary Search Tree (10)  
 (ii) Create AVL Tree
- Q-4 Answer the following questions (Any two). (20)  
 (i) Write a C/C++ program to create a sorted linked list.  
 (ii) Create a B and B<sup>+</sup> tree of order 5 for all even numbered alphabets in question 3.  
 (iii) Explain all types of rotations in AVL tree.

Slip No: 1

Exam Seat No.: \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE – III (CSE)

Examination

Day: Monday Date: 7<sup>th</sup> Oct Year: 2019 Time: 3:00 to 6:00 p.m.

SUBJECT: DATABASE MANAGEMENT SYSTEM (CSC1604)

Note: 1) Answer each section separately.  
2) Clearly state all your assumptions.

Max. Marks: 80

**SECTION - I**

- Q1) A. For each of the following relations, 08
- Find the key(s)
  - Find the normal form
1. R(ABCDE)  
A→BC  
BC→E  
C→D
2. R(ABCDEF)  
AB→CDEF  
B→F  
A→DE  
C→A  
E→B
- B. What are views? Explain in detail. 05
- Q2) A. Write a PL/SQL Block which takes as input the employee no and gives a 10% increase in salary to that employee. (Assume the EMP and DEPT tables) 08
- B. What are segments? 05
- OR**
- Q2) A. Write a PL/SQL Block which takes as input the dept. no and displays the total no. of employees working in that dept. (Assume the EMP and DEPT tables) 08
- B. What are cursors? 05
- Q3) Write short notes: (Any two) 14
1. 2NF
  2. Redo log files
  3. IS A Relation
  4. Tablespace

**P.T.O.**

Slip No: 2

Exam Seat No.: \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE – III (CSE)

Examination

Day: Monday Date: 7<sup>th</sup> Oct Year: 2019 Time: 3:00 to 6:00 p.m.

SUBJECT: DATABASE MANAGEMENT SYSTEM (CSC1604)

**SECTION – II**

- Q4) A. Explain the following commands with examples: 08  
1. GRANT  
2. HAVING  
3. ORDER BY  
4. DISTINCT
- B. Explain the column level and table level constraints and their differences. 05
- Q5) A. Explain the following relational algebraic operators: 06  
1.  $\sigma$   
2. /  
3.  $\bowtie$
- B. Draw an E-R Diagram for a Hospital Management System. 07
- OR**
- Q5) A. Explain the Relational Model and why a table is called a relation. 06
- B. Draw an E-R Diagram for the Railway Reservation System. 07
- Q6) Write short notes: (Any two) 14  
1. SGA and PGA  
2. Locking in Oracle  
3. Indexes  
4. Functional Dependency
-

Slip No: \_\_\_\_\_

Exam Seat No.: \_\_\_\_\_

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE II (CSE) Examination

Day: Friday Date: 09/12 Year: 2022 Time: 11:30 AM to 2:30 PM

**SUBJECT:** Design and Analysis of Algorithms (CSE1402)

**Max. Marks: 80**

**Note:** (1) Answer both the sections in separate answer books  
(2) Q1 and Q4 are compulsory.

**SECTION I**

SECTION I		
<b>Q1</b>	<b>Answer the following questions:</b>	
1	What are the four distinct areas of study of algorithms	[04]
2	Analyze the best, average and worst case complexity for Quick Sort.	[03]
3	State Master's theorem.	[02]
4	Describe the travelling salesman problem and discuss how to solve it using dynamic programming	[04]
<b>Q2</b>	<b>Answer in brief: (Any three)</b>	[09]
1	Determine the frequency counts for all statements in the following algorithm segment $i:=1;$ <b>while</b> ( $i \leq n$ ) <b>do</b> { $x:=x+1;$ $i:=i+1;$ } 	
2	Solve the recurrence relation using substitution method $T(n) = \begin{cases} T(1) & n=1 \\ aT(n/b)+f(n) & n>1 \end{cases}$ , where $a=5, b=4$ , and $f(n)=cn^2$ . 	
3	What is backtracking? Where is backtracking used to solve the problem.	
4	State the binary search algorithm and analyse its efficiency.	
5	State and explain the time complexity of bubblesort algorithm.	
<b>Q3.</b>	<b>Answer the following (Any Three):</b>	[18]
1	a) State the greedy Knapsack Problem b) Find an optimal solution to the knapsack instance $n=4$ objects and the capacity of the knapsack $m=15$ , profits (10,5,7,11) and weights are (3,4,3,5)	
2	Derive time complexity of job sequencing with deadlines. Obtain the optimal solution when $n=5$ , $(p_1, p_2, \dots) = (20, 15, 10, 5, 1)$ and $(d_1, d_2, \dots) = (2, 2, 1, 3, 3)$ .	
3	Distinguish between Greedy method and dynamic programming	
4	What is DFS? Explain with example. Show the ordering of vertices produced by topological sort for the following graph:	

P-T.O



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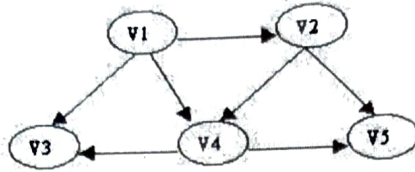
Exam Seat No.: \_\_\_\_\_

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE II (CSE)

Examination

Day: Friday Date: 09/12 Year: 2022 Time: 11:30 AM to 2:30 PMSUBJECT: Design and Analysis of Algorithms (CSE1402)

- 5 Find the longest common subsequence for the following two sequences using dynamic programming. Show the complete process.
- X = 100101001
- Y = 101001

## SECTION II

## Q4. Answer the following:

- 1 Explain subset-sum problem and discuss the possible solution strategies using backtracking. [03]
- 2 Explain the various criteria used for analyzing algorithms. [03]
- 3 Define P, NP, NP-Hard and NP-Complete Problem [04]
- 4 What is stable sorting method? Is merge sort a stable sorting method? Justify. [03]
- 5 Explain Graph Coloring [03]

## Q5 Answer the following in brief: (Any four) [09]

- 1 Define graph, complete graph and connected graph.
- 2 Explain Dijkstra algorithm to find the shortest path
- 3 State the principle of optimality. State two problems for which the principle does not hold.
- 4 What are the advantages of dynamic programming method over divide and conquer method?
- 5 Arrange following growth rates in increasing order.  
 $O(n^{1/4})$ ,  $O(n^{1.5})$ ,  $O(n^3 \lg n)$ ,  $O(n^{1.02})$ ,  $\Omega(n^6)$ ,  $\Omega(n!)$ ,  $O(\sqrt{n})$ ,  $O(n^{6/2})$ ,  $\Omega(2n)$

## Q6 Answer the following: (Any Three) [15]

- 1 What is Recursion? Give Recursive algorithm for Tower of Hanoi Problem and give analysis of it.
- 2 Differentiate branch and bound and back tracking algorithm.
- 3 Solve all pair shortest path problem for the following graph using Floyd's algorithm.

Conti. (B)

Slip No: \_\_\_\_\_

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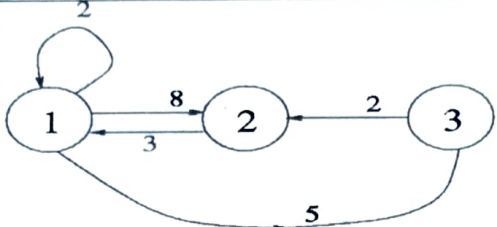
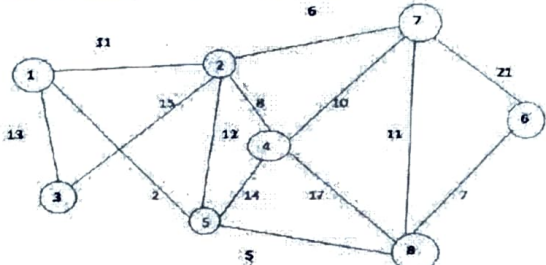
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THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S. S. BE II (CSE) Examination

Day: Friday Date: 09/12 Year: 2022 Time: 11:30 AM to 2:30 PM

SUBJECT: Design and Analysis of Algorithms (CSE1402)

		
4	Describe the algorithm for Hamiltonian cycles and determine the order of magnitude of the worst-case computing time for the backtracking procedure that finds all Hamiltonian cycles.	
5	Define spanning tree. Compute a minimum cost spanning tree for the graph of figure using kruskal's algorithm. 	

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Exam Seat No.: \_\_\_\_\_

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE IV (CSE) Examination

Day: Saturday Date: 03/12 Year: 2022 Time: 3:00 PM to 6:00 PM

SUBJECT: Machine Learning (CSE1807)

**Note: (1) Answer both the sections in separate answer books  
(2) Q1 and Q4 are compulsory.**

**Max. Marks: 80**

**SECTION I**

**Q1 Answer in brief: [15]**

- 1 Write a brief note on supervised algorithms.
- 2 Distinguish between classification and regression.
- 3 Define (i) F1 Score (ii) Precision (iii) Recall (iv) Information Gain (v) Machine Learning

**Q2**

**A 1 The following table shows the results of a recently conducted study on the [06]**

correlation of the number of hours spent driving with the risk of developing acute backache. Find the equation of the best fit line for the data.

Number of hours spent driving (x)	Risk score on a scale of 0-100 (y)
10	95
9	80
2	10
15	50
10	45
16	98
11	38
16	93

**2 Write a note on regularization [04]**

**OR**

**B 1 Discuss PCA. [05]**

**2 Discuss Logistic Regression. [05]**

**Q3 Answer the following(Any Three): [15]**

- 1 State the advantages and disadvantages of decision trees.
- 2 Explain the naive bayes classifier.
- 3 Define bias , variance, nominal variable, ordinal variable, Gini Index .
- 4 What is a learning algorithm? What is a training set and a test set?

**SECTION II**

**Q4 Answer the following: [15]**

- 1 Write a note on Agglomerative Hierarchical clustering.
- 2 Discuss the concept of boosting.
- 3 Write a note on deep neural networks

Slip No: \_\_\_\_\_

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Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S. S. BE IV (CSE) Examination

Day: Saturday Date: 03/12 Year: 2022 Time: 3:00 PM to 6:00 PM

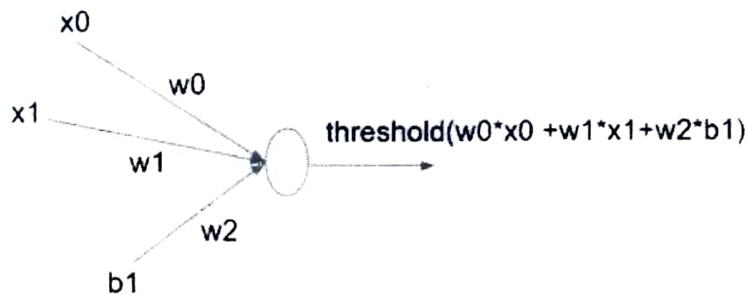
SUBJECT: Machine Learning (CSE1807)

Q5 A Answer in brief: (Any three) [09]

- 1 Write a brief note on reinforcement learning.
- 2 Discuss in brief any two loss functions.
- 3 What are autoencoders?
- 4 Write in brief about feed forward neural networks.
- 5 Write a note on underfitting and discuss possible solutions.

Q6 Answer the following: (Any Four) [16]

- 1 Write a note on ensemble learning.
- 2 Write a note on Linear Regression.
- 3 What is cross entropy? What is its use in machine learning?
- 4 Discuss Support Vector Machine.
- 5



Consider the neural network above. Find the appropriate weights for  $w_0, w_1$  and  $w_2$  to represent the AND function.

Threshold function = { 1, if output > 0 ; 0 otherwise }

$x_0$  and  $x_1$  are the inputs and  $b_1=1$  is the bias.

\*\*\*\*\*

Slip No: \_\_\_\_\_ 01 \_\_\_\_\_

Exam seat No: \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

**F.S.B.E.-I (All branches) Examination**

**Day: Thursday Date: 21/11/2019 Year: 2019 Time: 11.30 am to 2.30 pm**

**SUBJECT: MATERIALS SCIENCE [MME 1101]**

**Notes:**

1. Answers to the TWO sections must be written in TWO separate answers books.
2. Draw figure / sketches whenever necessary.
3. Figures to the right indicate full marks for each question.

**Maximum Marks: 100**

**SECTION – I**

- Q-1 (a)** Define engineering materials. Classify and explain various engineering materials. (08)
- (b)** Draw the following planes and directions in separate cubic unit cell. (08)
- $(\bar{1} 0 1)$        $[\bar{1} 1 \bar{2}]$        $(1 2 1)$        $[1 2 3]$

- Q-2 (a)** List out all seven types of crystal system. Draw unit cell and mention interfacial angles along with lattice parameters for all crystal systems. (08)
- (b)** What is atomic packing factor? Calculate the atomic packing factor (APF) for hexagonal close packed (HCP) crystal structure. (08)

**OR**

- Q-2 (a)** Define/Explain terms: Engineering stress, Engineering strain, True stress. Derive relationship between engineering stress- true stress and engineering strain-true strain. (08)
- (b)** What is line defect? Explain briefly different types of line imperfections. (08)
- Q-3** Attempt **AnyThree** of the followings. (18)
- (a) State and explain Gibb's phase rule. Calculate degree of freedom at various states (liquid, solid and melting/freezing point) in pure metal's cooling curve.
  - (b) Write short note on: Allotropy of pure iron.
  - (c) The interplanar spacing for (220) plane of the FCC Aluminium (Al) is  $1.42\text{\AA}$ . Calculate its density. Given, atomic weight of Al is 26.98 gm/mole and avogadro's number is  $6.023 \times 10^{23}$  atoms/mole.
  - (d) A cylindrical specimen of steel is tensile tested to fracture and found to have an engineering fracture stress 370 Mpa and true stress at fracture point is 620 Mpa. Determine.
    - 1) The ductility in terms of % of reduction in area.
    - 2) If the cross sectional diameter at fracture point is 10.5 mm, then what is the load at fracture point?

**(P.T.O.)**

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**SECTION – II**

- Q-4 (a) Explain briefly different types of galvanic cells. (08)  
(b) Compare and contrast CMC and PMC (04)  
(c) Discuss about solidification of glass. (04)

- Q-5 (a) What is Nano material? Explain any one method used for the synthesis of the nano material. (08)  
(b) Explain in detail about superconductive material. (08)

**OR**

- Q-5 (a) What do you mean by solid solution? Explain different factors which are responsible for making substitutional solid solution. (08)  
(b) Briefly discuss cathodic protection methods. (08)

- Q-6 Differentiate **Any Three** of the following: (18)  
(a) Soft and hard magnetic materials.  
(b) p-type and n type semiconductors.  
(c) Frankel and Schottky defects.  
(d) Crystalline and amorphous materials

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Slip No. : 1

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S.S. OF BE-III (CSE)

Examination

Day: Friday Date: 11-10-2019 Year: 2019-2020 Time: 03:00 pm to 06:00 pm

Subject: Microcontroller (CSC1605)

Maximum Marks: 80

Note:

- i. Write answer of each section in separate answer books.
- ii. Q-1 and Q-4 are compulsory questions.
- iii. Draw necessary diagram with pencil and clearly.

SECTION-I

Q-1) Answer the following:

- a) How are the different banks in the 8051 selected? (02)
- b) Explain the main features of IC 8051 microcontroller Architecture. (03)
- c) Explain POP and PUSH instruction using stack memory and stack pointer. (03)
- d) Define: i) Comment ii) Label iii) Operand iv) OpCode (02)

Q-2) Explain following instructions. (Any 5) (10)

- a) XCH @R1 b) JC 02 c) DEC 51h d) MOV R7,#50H
- e) SUBB A, direct f) SWAP A g) ANL 34h,#69h

Q-3)

- a) Define Addressing mode. Explain all the addressing modes with example. (07)

Or

- a) Write program to Interface seven segment display to 8051. (07)

- b) Divide the data in RAM location 42h by the number 17h; put the quotient in R3 and remainder in R4. (05)

- c) Write the working of 8051 Oscillator and clock with proper diagram. (08)

Or

- i) Write a program to load accumulator A, DPH and DPL with FCh. (03)

- ii) What would be the contents of the accumulator after executing the following sequence ? (03)

MOV 53h,#54h  
MOV 53, #5Ch  
MOV A,53

- iii) Enlist all the instructions that use stack memory. (02)

P.T.O

Slip No. : 2

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S.S. OF BE-III (CSE)

Examination

Day: Friday Date: 11-10-2019 Year: 2019-2020 Time: 03:00 pm to 06:00 pm

Subject: Microcontroller (CSC1605)

SECTION-II

- Q-4) Do as Directed:
- a) How many interrupts are there in 8051? What is the nature of 8051 interrupts? (03)
  - b) Describe the dual role of port 0 in 8051 microcontroller. (03)
  - c) Put a random number in R5 and decrement it until it equals DCh. (04)

- Q-5)
- a) Count the number of 1s in any number in register R2 and put the count in R6. (07)
  - b) What is the difference between a long jump (LJMP), a short jump (SJMP) and absolute jump (AJMP)? (08)
- Or**
- b) Draw & explain block diagram of internal architecture of 8051. (08)

- Q-6)
- a) i) Explain the difference between MOVX and MOV instruction. (02)
  - ii) Explain the Registers: 1) PC 2) PSW 3) DPTR. (03)
  - b) Set the carry flag to one if the number in A is even. Set the carry flag to zero if the number in A is odd. (05)
- Or**
- b) Store the least significant nibble of A in both nibble of RAM address 4Dh. (05)  
e.g. if A = A8h then (4Dh) = 88h
  - c) Explain Timer/ Counter Control Logic with proper Diagram (05)
- Or**
- c) Explain the serial port registers: i) SCON ii) SBUF iii) SMOD (05)
- .....



## THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S. S. BE III (CSE)

Examination

Day: Thursday Date: 08/12/2022 Year: 2022 Time: 03:00 PM to 6:00 PMSUBJECT: .NET Technologies (CSE1605)

Note: (1) Answer both the sections in separate answer books  
(2) Q1 and Q4 are compulsory.

Max. Marks: 80

## SECTION I

Q1 Answer the questions given below: [14]

- 1 What are the benefits of storing metadata with MSIL itself?
- 2 What is Roslyn?
- 3 What are value types?
- 4 With an example demonstrate creating and using two dimensional arrays in c#?
- 5 What will be the output of the given code snippet?  

```
double a = 3;
double b = 4;
Console.WriteLine($"Area of the right triangle with legs of {a} and {b} is {0.5 * a * b}");
Console.WriteLine($"Length of the hypotenuse of the right triangle with legs of {a} and {b}
is {CalculateHypotenuse(a,b)}");
double CalculateHypotenuse(double leg1, double leg2) => Math.Sqrt( leg1 * leg1 + leg2 *
leg2);
```
- 6 static void Swap<T>(ref T lhs, ref T rhs)

```
{
    T temp;
    temp = lhs;
    lhs = rhs;
    rhs = temp;
}
```

```
public static void Main()
{
    int a = 1;
    int b = 2;
    Swap<int>(ref a, ref b);
    System.Console.WriteLine(a + " " + b);
}
```

What will be output of the above given code?
- 7 With an example explain foreach loop in c#?

Q2 Answer in brief: (Any three) [12]

- 1 Explain with example, exception handling in .NET ?
- 2 Explain Generics, with its applicability and examples.
- 3 Write a note on Func<T> and Action<T> delegates. Give suitable examples.
- 4 What are lambda expressions? Explain with suitable examples.
- 5 Write a note on assemblies.

Q3. Answer the following (Any Two): [14]

- 1 Explain with suitable code examples, object oriented features in C#.
- 2 (i) Write a C# program and compute the sum of the digits of an integer.  
(ii) Explain properties with suitable examples.
- 3 Write a note on .NET Core and its critical components

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Slip No: 2

Exam Seat No.: \_\_\_\_\_

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S. S. BE III (CSE) Examination

Day: Thursday Date: 08/12/2022 Year: 2022 Time: 03:00 PM to 6:00 PM

SUBJECT: .NET Technologies (CSE1605)

**SECTION II**

**Q4. Answer the questions given below: [14]**

- 1 Differentiate between ADO.NET and Entity Framework Core?
- 2 What is the benefit of using hot reload in ASP.NET Core MVC application?
- 3 What is .NET CLI?
- 4 What is the use of \_Layout.cshtml in mvc application?
- 5 What will be the output of the following code?  

```
static void Main(string[] args)
{
    int i, s = 0;
    for (i = 1; i <= 10; s = s + i, i++);
    {
        Console.WriteLine(s);
    }
    Console.ReadLine();
}
```
- 6 What are the benefits of using views in an ASP.NET MVC application?
- 7 Write code to define constant float value 7.9 in C#. What is the difference between float and double?

**Q5 Answer the following in brief: (Any four) [16]**

- 1 Explain Middleware in asp.net core?
- 2 What are tag helpers? What is their use explain clearly? Give suitable examples.
- 3 Explain the data annotations in model files and its benefits.
- 4 Explain the features and advantages of creating a MVC based web application in ASP.NET ?
- 5 Write a brief note on LINQ?

**Q6 Answer the following: (Any Two) [10]**

- 1 Explain routing in ASP.NET Core MVC application? What is the default route normally set? Where (in which file/method) is the default route set?
- 2 Write a note on webservers that can be used to host an ASP.NET Core MVC application.
- 3 Write a brief note on Entity Framework Core.

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Slip No. : 01

EXAM SEAT NO. : \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S.S. of BE – IV ( Computer )

Examination

Day : Saturday

Date : 12-10-2019

Year : 2019

Time : 3:00 to 6:00 pm

SUBJECT : NETWORK SECURITY ( CSC1805 )

Note : -- Answer to the two sections must be written in separate answer books.

Max Marks : 80

**Section - I**

- Q-1. A) Explain briefly Active and Passive attacks. [04]  
B) Explain the terms Diffusion and Confusion with respect to product cipher. [03]  
C) Decrypt the following ciphertext which has been encrypted using the Playfair cipher with the key = "NETWORKSECURITY". [03]  
M W Q T W N D C E R B X H A C V  
D) Explain briefly the Repudiation attack. [02]
- Q-2. A) Explain polyalphabetic substitution. Describe briefly any one polyalphabetic cipher. [06]  
B) Explain briefly the concept of Asymmetric-Key cryptography. [03]  
C) List and explain the various ways in which the claimant can be verified in Entity Authentication [04]

**OR**

- Q-2. A) Explain in brief the Key Generation process used in DES with diagram. [05]  
B) Describe with the help of a figure AES Round and explain briefly any two Transformations. [07]  
C) Define the term : False Negative. [01]

Q-3. Attempt **any three** from the following : [15]

- A) Explain briefly the message initialization process in SHA-512.  
B) Describe briefly the RSA cryptosystem.  
C) Describe the Diffie-Hellman key agreement.  
D) List the different modes of operation for modern block cipher. Explain briefly CFB mode of operation giving its advantages / disadvantages.  
E) What is a KDC ? Explain a simple protocol for creating a session key using a KDC.

— P.T.O. —

70-6  
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Slip No. : 02

EXAM SEAT NO. : \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S.S. of BE – IV ( Computer )

Examination

Day : Saturday

Date : 12-10-2019

Year : 2019-20

Time : 3:00 to 6:00 pm

**SUBJECT :** NETWORK SECURITY ( CSC1805 )

**Section – II**

- Q-4. A) Define : Intrusion. Explain various classes of Intruders. [04]  
B) Explain briefly the concept of Certification Revocation and its importance. [03]  
C) What is the significance of IPSec ? Briefly explain the Transport and Tunnel mode in IPSec. [06]

Q-5. Attempt **any three** from the following : [15]

- A) List different types of PGP packets. Explain any three of them in brief.  
B) Describe the Statistical Anomaly Detection approach to Intrusion Detection.  
C) List different types of Viruses. Explain them in a line or two.  
D) Explain Audit Record as a tool for Intrusion Detection.  
E) Explain ESP protocol of IPSec.

- Q-6. A) What is DDoS attack ? Explain various forms of DDoS attack. [06]  
B) Write a short note on : Honeypots [04]  
C) What do you understand by a Security Association. [02]

**OR**

- Q-6. A) Categorize different kinds of malicious software. Explain 'Backdoor' and 'Trojan Horses' in brief. [06]  
B) What is SSL ? What are the various services provided by it ? [04]  
C) Differentiate between Message Authentication and Entity Authentication. [02]

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Slip No: 73-9/05

Exam Seat No.: \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

F. S. BE IV (CSE) Examination

Day: Thursday Date: 22/12 Year: 2022 Time: 3:00 PM to 6:00 PMSUBJECT: Python Programming (CSE1710)

**Note:** (1) Answer both the sections in separate answer books  
 (2) Q1 and Q4 are compulsory.

**Max. Marks: 80****SECTION I****Q1 Answer the given questions: [15]**

- 1 What will be the output of the following code:  
`names = ("desk","rewire","madam","freer")`  
`selectedNames = list(filter(lambda word: word== word[::-1],names))`  
`print(selectedNames)`
- 2 Explain the //, %, and \*\* operators in Python
- 3 List the different types in python. What are mutable and immutable types?
- 4 With an example, explain/demonstrate the use of following dictionary methods:  
`get()`, `keys()`, `pop()`
- 5 Explain any two methods of OS module with proper examples.

**Q2**

- A**
- 1 Explain different access level of class attributes in python? How can we get or set values of private attributes in python? [05]
  - 2 Explain command line arguments and write a program to demonstrate use of command line arguments. [05]

**OR**

- B**
- 1 Given the list `lst = ['ravi','raja','rome','rita']`. Write code that will output the following `['RAVI','RAJA','ROME','RITA']` [05]
  - 2 What is an abstract class? Explain with simple example how can you implement an abstract class in python? [05]

**Q3 Answer the following(Any Three): [15]**

- 1 Write Python program that accepts a sentence and calculate the number of words, digits, uppercase letters and lowercase letters.
- 2 Explain the use of `join()`, `split()`, `strip()` string methods with examples.
- 3 Write Python program to sort numbers in a list in ascending order using any sorting algorithm. Please don't use inbuilt sort method even if available here.
- 4 What is tkinter? Discuss its use and working.
- 5 Write Python Program to count the number of characters in a string using dictionaries. Display the keys and their values in alphabetical Order.

**SECTION II****Q4 Answer the following questions:**

- 1 Explain slicing in python using proper examples. (Atleast two examples) [04]
- 2 Explain with proper example how operator overloading can be done in python. Write complete code. [05]
- 3 List any four functions of the date and time module [01]

**Q5 A Answer in brief: (Any four) [16]**

- 1 Can a function return multiple values? How? Give a code example of such function.
- 2 Explain with sample code event handling using tkinter?
- 3 What are the different layouts that can be created using tkinter in python? Explain any one of them using code.

PTO

Slip No: \_\_\_\_\_

73-b/35

Exam Seat No.: \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

F. S. BE IV (CSE) Examination

Day: Thursday Date: 22/12 Year: 2022 Time: 3:00 PM to 6:00 PM

**SUBJECT:** Python Programming (CSE1710)

- 4 Explain the available looping statements in python with example?
- 5 What do you understand by local and global scope of variables? How can you access a global variable inside the function, if function has a variable with same name.
- 6 Write a program to count the words "to" and "the" present in a text file "Poem.txt"

**Q6**

**Answer the following: (Any Two)**

**[14]**

- 1 Explain how object oriented principles are achieved in python program? Write a code example. Write about the possibilities and limitations.
- 2 What is data compression? What is loss less compression? List any five libraries available for data compression using python? Write sample code using any one library available to compress and decompress a file using python.
- 3 Write a note on storing complex data in files using python program and reading the stored data back to a python program.
- 4 Write a Python program to check the validity of a password given by the user.  
The Password should satisfy the following criteria:
  1. Contain at least 1 letter between a and z
  2. Contain at least 1 number between 0 and 9
  3. Contain at least 1 letter between A and Z
  4. Contain at least 1 character from \$, #, @
  5. Minimum length of password: 6
  6. Maximum length of password: 12

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**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

SS BE-III (CSE) (2019) Examination

Semester - VI

**CSE1604: Software Engineering****Date: 06<sup>th</sup> December 2022 (Tuesday)****Max. Marks: 80****Time: 03:00 PM to 06:00 PM****Instructions: Use separate answer sheet for different section. Give example(s) wherever required.****SECTION – I**

- Q-1 Do as directed (ANY FIVE). [10]**
- A. List advantages of SRS.
  - B. What is UML?
  - C. List Quality Parameters for Software and explain any one of them in brief.
  - D. The goal of coding should be to reduce the Testing and Maintenance efforts. Justify.
  - E. Explain in brief symbols used to draw the Data Flow Diagram.
  - F. What is Regression Testing?
  - G. List effort in percentages required by different phases of Software Development.
- Q-2 Write a short note on following (ANY TWO). [10]**
- A. Coupling and Cohesion
  - B. Scrum Software Development Methodology
  - C. Structure Chart
- Q-3 Explain the following UML Diagrams with suitable examples (ANY TWO). [20]**
- A. Use Case Diagram
  - B. Class Diagram
  - C. Activity Diagram

**SECTION – II**

- Q-4 Do as directed (ANY FIVE). [10]**
- A. What is CMM?
  - B. List Golden Rules of UI Design.
  - C. What are few top Risks in Software Project?
  - D. Differentiate Adaptive Maintenance and Corrective Maintenance.
  - E. What is the objective of SCM Process?
  - F. List different activities in Software Project Management.
  - G. What is Metric? Explain with suitable example.
- Q-5 Write a short note on following (ANY TWO). [10]**
- A. Levels of Testing
  - B. COCOMO
  - C. CASE Tools
- Q-6 Explain the following concepts in detail. (ANY TWO). [20]**
- A. White Box Testing and Black Box Testing
  - B. Coding Standards, Dos and Don'ts.
  - C. PERT/CPM

28-9/25

Slip No. : 1

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F.S. OF BE-III (CSE)

Examination Day: Saturday Date: 16/11/2019 Year: 2019 Time: 03:00 pm to 06:00 pm

Subject: Software Engineering (CSC1505)

**Note:**

- i. Write answer of each section in separate answer books.
- ii. Q.1 and Q.5 are compulsory questions.
- iii. Draw necessary diagram with pencil and clearly.

**SECTION-I**

- Q.1 a) What is Software Engineering? What is Process? What is Product? 03  
b) Explain Unit Testing in Detail. 03  
c) Draw use-case diagram for ATM machine. 04

- Q.2 For a library management application, consider the functionalities of students registering themselves to the library, borrowing books after providing their library cards. Moreover librarian checks for the availability of books and also checks the maximum number of books that the students can issue. Librarian issues the books as well as sees that the issued books are returned within a span of 15 days. If the student fails to return the book, sms reminder is sent to the student and fine is levied accordingly. Addition of new books to library is also taken care of by librarian. Librarian also submits a list of required books. Draw its class diagram, use-case diagram and sequence diagram 10

**OR**

- Q.2 A store is in the business of selling paints and hardware items. A number of reputed companies supply items to the store. New suppliers can also register with the store after providing necessary details. The customer can place the order with the shop telephonically. In case items are not available customers are informed. The detail of every new customer is stored in the company's database for future reference. Regular customers are offered discounts. Additionally details of daily transactions are also maintained. The suppliers from time to time also come up with attractive schemes for the dealers. In case, scheme is attractive for a particular item, the store places order with the company. Details of past schemes are also maintained by the store. The details of each item i.e. item code, quantity available etc. is also maintained. Draw level-1 DFD and provide data dictionary and context diagram for the same. 10





8850/75

Slip No. : 2

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F.S. OF BE-III (CSE)

Examination Day: Saturday Date: 16/11/2019 Year: 2019 Time: 03:00 pm to 06:00 pm

Subject: Software Engineering (CSC1505)

- Q.3 a) Differentiate between function oriented design and object oriented design approaches. 04
- b) Explain coupling and cohesion and different types of cohesions. 04
- c) What is Software Requirement Specification (SRS)? Why is it important? List the characteristic of a good quality SRS? What contents can we include in it? 06

OR

- Q.3 a) Describe Integration testing and unit testing with its types. 06
- b) What do you mean by alpha testing and Beta testing? 02
- c) Compare Black box Testing and white Box testing. 03
- d) Give the disadvantages of DFD model. 03

- Q.4 Explain Spiral model in detail with its advantages and disadvantages. Also mention how it differs from prototype model. 06

OR

- Q.4 Explain iterative waterfall model with its advantages and disadvantages. Also mention the disadvantages of classical waterfall model it overcomes. 06

SECTION-II

Q.5 Short Questions: 14

- a. What is the difference between Verification and Validation?
- b. What is software quality assurance?
- c. What is SDLC?
- d. Which methods are used for software cost estimation?
- e. What do you mean by Error Seeding?
- f. Software does not "wear out" but it does deteriorate. Why?
- g. What is the difference between system and Application software?
- h. Context diagram represents system as a whole. True / False.
- i. What is a sequence diagram in UML?
- j. What is the difference between uncertainty and loss?
- k. What is the use of debugging?
- l. What is Security testing?
- m. What do you mean by control flow oriented design technique?
- n. What is data dictionary?

886  
75

Slip No. : 3

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F.S. OF BE-III (CSE)

Examination Day: Saturday Date: 16/11/2019 Year: 2019 Time: 03:00 pm to 06:00 pm

Subject: Software Engineering (CSC1505)

Q.6 Determine cyclomatic complexity and basis set of linearly independent paths for the following code: 07

```
public static boolean
is_prime(int n)
{
    boolean prime=TRUE;
    int i=2;
    while (i<n)
    {
        if(n%i ==0)
        {
            prime=false;
        }
        i++;
    }
    return (prime);
}
```

OR

Q.6 Consider the program given below 07

```
int computeGCD(int x,int y)
{
    while (x != y)
    {
        if (x>y) then x=x-y; else y=y-x;
    }
    return x;
}
```

Draw the flow graph. Determine the cyclomatic complexity. Arrive at all the independent paths.

- Q.7
- a) What are the steps in software Project Planning? What is effort estimation? 03
  - b) Prepare DFD for Employee Attendance System. 04
  - c) What do you mean by debugging? Explain various debugging approaches. 07



88/175

Slip No. : 4

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

F.S. OF BE-III (CSE)

Examination Day: Saturday Date: 16/11/2019 Year: 2019 Time: 03:00 pm to 06:00 pm

Subject: Software Engineering (CSC1505)

OR

- Q.7 a) Explain Functional Requirement and Non Functional Requirement with example of Online Examination System. 07
- b) (i) Draw the network diagram. 07  
(ii) Calculate ES, EF, LS and LF. Estimate project cost by critical path method.

Task ID	Task Description	Task Predecessors	Task Duration (hours)
A	Project start		0
B	Buy materials for A	A	10
C	Buy materials for B	A	20
D	Build A	B, C	30
E	Build B	B, C	20
F	Polish and finish B	E	40
G	Join A and B	D, F	20
H	Project finish	G	0

Q.8 Explain COCOMO Model in detail. 05

OR

Discuss Prototype Lifecycle model with its advantages and disadvantages. 05

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W-a  
80

## The Maharaja Sayajirao University of Baroda

Semester: FSBE-IV  
Subject: Statistics in Data Science  
Subject Code: CSE1705

Date: 15<sup>th</sup> Dec 2022  
Max Marks: 80  
Time: 3:00-6:00 pm

### Section A

**Ques 1. A.** Compare & contrast Primary and Secondary data on the basis of originality, source, time factor, cost factor, reliability & suitability, precautions and organisation factor in a tabular format

**OR**

**B.** List and explain the types of non-Random sampling techniques. **(8 marks)**

**Ques 2. A.** Draw a pie diagram to represent the following medium of transport in a town:

Medium of Transport	Private Vehicles	Taxi	Buses	Auto-Rickshaw
Number of Vehicles	4200	2000	1800	2000

**(4 marks)**

**B.** Draw a 'less-than' ogive and 'more-than' ogive curves for the following frequency distributions:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Number of students	3	4	8	10	3	2

**(4 marks)**

**Ques 3.** In a bulb factory, three machines, A, B, C, manufacture 60%, 25% and 15% of the total production respectively. Of their respective outputs, 1%, 2% and 1% are defective. A bulb is drawn at random from the total product and it is found to be defective. Find the probability that it was manufactured by machine C. **(6 marks)**

**Ques 4. A.** What is the difference between the following? Explain giving an example of each:

- Null & Alternate Hypothesis
- Rejection and Nonrejection Regions

**(6 marks)**

**B.** Identify and name the type of 'One-dimensional diagram' from the following statements:

- It is used for representing net changes in data like net profit, net exports, net imports etc
- It comprises of groups of rectangular bars of equal width for each category of data.
- It represents the percentage of total for each component instead of their magnitude.
- It is used when the value of some variable is very high or low as compared to others.

**(4 marks)**

**Ques 5.** Compare & contrast Primary and Secondary data on the basis of originality, source, time factor, cost factor, reliability & suitability, precautions and organisation factor in a tabular format

**OR**

List the statistical concepts required to become a Data Scientist and write a line about each describing their function **(8 marks)**

L1-b  
80

Section B

**Ques 6.** Explain Durbin-Watson Test for Autocorrelation for Interpretation of the Statistic with an example. (8 marks)

**Ques 7. A.** The management of Priority Health Club claims that its members lose an average of 10 pounds or more within the first month after joining the club. A consumer agency that wanted to check this claim took a random sample of 36 members of this health club and found that they lost an average of 9.2 pounds within the first month of membership with a standard deviation of 2.4 pounds. Find the  $p$  - value for this test. What will your decision be if  $\alpha = .01$ ? What if  $\alpha = .05$ ?

OR

**B.** The TIV Telephone Company provides long-distance telephone service in an area. According to the company's records, the average length of all long-distance calls placed through this company in 1999 was 12.44 minutes. The company's management wanted to check if the mean length of the current long-distance calls is different from 12.44 minutes. A sample of 150 such calls placed through this company produced a mean length of 13.71 minutes with a standard deviation of 2.65 minutes. Using the 5% significance level, can you conclude that the mean length of all current long-distance calls is different from 12.44 minutes? (10 marks)

**Ques 8.** What are the characteristics of the Chi-Square Distribution? Explain the Goodness-of-fit Test for Equal Expected Frequencies giving a suitable example. (8 marks)

**Ques 9.** Calculate the regression coefficient and obtain the lines of regression for the following data

X	1	2	3	4	5	6	7
Y	9	8	10	12	11	13	14

(8 marks)

**Ques 10. A.** Prove that the first  $n$  natural numbers' standard deviation equals

$$\sigma = \sqrt{\frac{n^2-1}{12}}$$

OR

**B.** In a town, 25% of the persons earned more than ₹ 45,000, whereas 75% earned more than ₹ 18,000. Calculate the absolute and relative values of dispersion. (6 marks)

—X—

Slip No. : \_\_\_\_\_

EXAM SEAT NO. : \_\_\_\_\_

**THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA**

S.S of BE III ( Computer Science & Engineering ) Examination

Day : WEDNESDAY Date : 16/10/2019 Year : 2019-20 Time : 03:00 to 06:00 PM

SUBJECT : Theory of Computation (CSC1606)

\* State and make necessary assumption where ever required.

Max Marks: 80

**SECTION-I**

Q.1 [A] Explain Kleen's theorem with Example. [10]

OR

Explain Optimization of DFA.

[B] Explain conversion (NFA to DFA) with example. [10]

Q.2 Design DFA for following regular expression: ( Any Two ) [20]

- 1)  $(a+b)^* ab$
- 2)  $a(aa+bb)^* aba$
- 3)  $(00+101)^* + (01 + 0)^*$

**SECTION-II**

Q.3 [A] Design and explain Push Down automata for even length palindrome strings. [10]

[B] Explain types of grammar with corresponding machine that can recognize it. [10]

OR

Explain context free and elimination of left recursion.

Q.4 [A] Design a Turing Machine for reversing a given string. [10]

OR

Design a Turing Machine for finding substring in a given string.

[B] Explain halting problem with example. [10]

— X —

Slip No. : 1

12-6/03

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S.S. OF BE-IV (CSE)

Examination Day: Saturday

Date: 19-10-2019

Year: 2019

Time: 3.00 PM to 6:00 PM

Subject: **Web Technology (CSC1831)**

**Maximum Marks: 80**

**Note:**

- i. Write answer of each section in separate answer books.
- ii. This paper contains two sections of 40 marks each.

**SECTION-I**

Q1 (A) Write HTML code to accept input from a user for registering a music course portal. The required inputs: First name, Last name, Gender, Date of Birth, Contact Number, Batch time. [7]

Q1 (B) What is an HTML form? Design simple form to register for new semester. [7]

OR

Q1 (B) What is HTML table? Write HTML code to print following table. [7]

	Height	Weight	Other category
males	1.9	0.003	yyy
females	1.7	0.002	xxx

Q1 (C) Give the document structure for the XHTML document and give the characteristics which differentiate it from HTML. [6]

OR

Q1 (C) Explain static web page, Dynamic web page and active web page [6]

Q2 (A) What is CSS? Explain different ways to write the CSS with example [7]

Q2 (B) Develop an XML document that will hold a book collection with fields for book name, author, ISBN number and quantity. Write suitable document type definition for the XML. [7]

OR

Q2 (B) Compare and contrast between HTML and XML. Write any XML document and DTD to describe its structure including elements, attributes and entities. [7]

Q2 (C) What is state management? Explain it using session, cookie, hidden variable. [6]

OR

Q2 (C) Explain SQL Injection and cross site scripting in detail. [6]

P.T.O.

Slip No. : 2

12-10/05

Exam Seat No.: \_\_\_\_\_

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

S.S. OF BE-IV (CSE)

Examination Day: Saturday

Date: 19-10-2019

Year: 2019

Time: 3.00 PM to 6:00 PM

Subject: **Web Technology (CSC1831)**

**SECTION-II**

Q3 (A) Write a note on Website Development cycle. [7]

Q3 (B) Write an HTML and JavaScript program which accepts N as input and displays first N Fibonacci numbers as list. [7]

OR

Q3 (B) Write down HTML and java script code to check mobile number (mobile number should start with 9 or 8). [7]

Q3 (C) Explain element selector, id selector and class selector in jQuery with example. [6]

OR

Q3 (C) Explain fadeIn(), fadeout(), and fadeTo() effects in jQuery with example. [6]

Q4 (A) List various HTML5 multimedia elements. Explain with example any four of them. [7]

Q4 (B) Explain digital signature in detail. [7]

OR

Q4 (B) Explain digital certificate in detail. [7]

Q4 (C) Explain following XSL element with example. [6]

1. sort
2. if
3. for-each

OR

Q4 (C) Differentiate between DTD and XML Schema. [6]

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