



JE - 063

Fourth Semester B.Tech. (CSE/ISE) Degree Examination, September 2022
(CBCS Scheme)

18CIPC404 : MICRO PROCESSORS AND MICRO CONTROLLERS

Time : 3 Hours

Max. Marks : 100

- Instructions :** i) Q.1 is **Compulsory**.
ii) Q.2 and Q.3 are **Compulsory**.
iii) Internal choices for Q.4 or Q.5, Q.6 or Q.7, Q.8 or Q.9.

1. Answer all the following 15 questions. Each question carries one mark. (15x1=15)
 - a) In 8086 Microprocessor the address bus is _____ bit wide.
 - b) _____ segment is used to declare the memory region.
 - c) 16 bit _____ register mainly helps in referencing the parameters variables passed to a sub routine.
 - d) _____ Flag Indicates the result of an arithmetic operation.
 - e) There are two interrupt request levels available on the ARM processor core _____ and _____.
 - f) Given two numbers 32 and 5F, subtract 32 from 5F by using unsigned subtraction method.
 - g) Find the solution of
MOV AX, 0354H
OR AX, DA78H
 - h) The processing of instructions is broken down into smaller units that can be executed in parallel by using _____ method.
 - i) The long multiply instructions produce a _____ bit result.
 - j) Given an Hexadecimal value 25H, Convert packed BCD to ASCII.
 - k) _____ is a combination of computer hardware and software.
 - l) Fill up the 5 stage Pipeline, Fetch → ... → ... → ... → ...
 - m) Scaled means the address is calculated using the base address register and _____
 - n) ROM code that is fixed on the device is called _____
 - o) _____ mode is a special version of user mode that allows full read & write access to the CPSR.

P.T.O.



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2. a) Explain the architecture of 8253 with a neat diagram.	5
b) Discuss the modes of operations of 8253 in detail.	4
c) Briefly explain pin functions of 8255.	7
3. a) Explain data processing instructions in detail.	7
b) Briefly explain Program status register instructions.	3
c) What is software interrupts and explain its importance in ARM ?	
4. a) What is microprocessor and discuss its importance in the current world ?	7
b) What do you mean by pipelined architecture, how is it implemented in 8086 ?	5
c) Briefly describe the functions of EU and BIU.	5
OR	
5. a) What is assembly language programming ? Write a sample program of addition of 5 bytes of data and saves the result.	9
b) Briefly explain the following directives. i) ORG ii) DUP iii) EQU iv) DQ	8
6. a) Write a C program to perform AND, OR and Ex-OR operations between the two data items and display each result.	10
b) What is packed and unpacked BCD ? Write a code for packed BCD to ASCII conversion.	7
OR	
7. a) Explain Logic instructions in detail.	10
b) What are Rotate Instructions ? How is it similar to Shift operations ?	4
c) Explain unsigned Division with different addressing modes.	3
8. a) What is embedded system ? Discuss its relevance in the real world.	7
b) Differentiate RISC and CISC.	5
c) What are the major design rules to implement RISC philosophy ?	5
OR	
9. a) Draw and discuss ARM core data flow model and its functional units in detail.	10
b) Explain current status program register in detail with the help of a basic layout.	7

**IV Semester B.Tech. (CSE/ISE) Degree Examination, Sept. 2022
 (CBCS Scheme)**
18CIPC 403 : DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 Hours

Max. Marks : 100

Instructions : Question No. 1, 2 and 9 are compulsory.

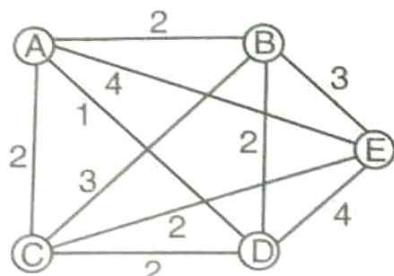
Answer Q. 3 or Q. 4, Q. 5 or Q. 6 and Q. 7 or Q. 8.

1. Answer the following : (15x1=15)

- a) Algorithms that require _____ number of operations are practical for solving only problems of very small size.
 - i) polynomial
 - ii) constant
 - iii) logarithmic
 - iv) linear
- b) Pseudocode may be defined as
 - i) Procedural solutions to problems
 - ii) A collection of connected geometric shapes containing a description of the algorithms steps
 - iii) A mixture of natural language and programming language like constructs
 - iv) A general approach to solving problems algorithmically
- c) Brute force strategy of designing algorithms relies (depends) on using
 - i) the problem statements and definitions directly
 - ii) solution of a smaller instance of the same problem
 - iii) the combined solutions of smaller sub problems
 - iv) the solution to a simpler instance of the same problem
- d) An algorithm that relies on pre-sorting its element list input is an example of
 - i) Decrease by variable size
 - ii) Transform by simplification
 - iii) Decrease by constant factor
 - iv) Decrease-and-conquer
- e) Computing space complexity includes
 - i) Data Space
 - ii) Code Space
 - iii) Stack Space
 - iv) All of the above

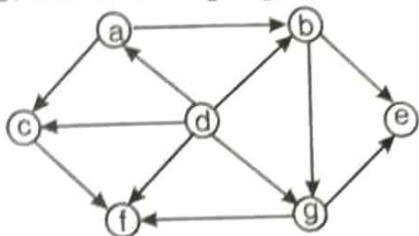


- f) _____ and _____ are the applications of Depth First Search.
- g) _____ algorithm is used to solve All Pairs Shortest Path Problem.
- h) The Solutions to Topological sort can be obtained using _____ and _____ methods.
- i) Data structure used to implement Breadth First Search is _____.
- j) What is Divide and Conquer Technique ?
- k) Define Transitive closure of a graph.
- l) Define Cost adjacency Matrix.
- m) What is an AVL tree ?
- n) What is an NP Complete Problem ?
- o) Define Minimum Spanning Tree.
2. a) With the help of flowchart, explain the various stages of design and analysis process of an algorithm. 10
- b) Solve the following recurrence relation : 7
- $x(n) = x(n - 1) + 5$
 - $x(n) = x(n/2) + n.$
3. a) Explain Closest-pair problem with an Algorithm. Derive its Time Complexity. 7
- b) Find the minimum tour cost of Travelling Salesman Problem using Exhaustive search method. 10



OR

4. a) Explain the three variations of Decrease and Conquer Technique with examples. 7
b) Write and apply DFS based Algorithm to solve the Topological Sort problem for the following digraph. 10



5. a) Write an algorithm for Quicksort and derive its time complexity. Sort the following numbers using Quicksort. 10
555, 333, 222, 777, 444, 999, 666, 111, 888.
b) Explain how divide and conquer technique can be applied to multiply two large integers. 7

OR

6. a) Construct the Max Heap and sort the following array of integers using Heap Sort. 10
155, 235, 199, 411, 188, 122, 827, 123, 267, 248.
b) Write an algorithm for constructing a shift table and search for a pattern in a text using Horspool's String Matching algorithm. 7
7. a) Write the Floyd's Algorithm and give its time complexity. Find the all pairs shortest problem for the following weight matrix. 10

0	1	2	3	4
1	0	80	30	∞
2	80	0	40	10
3	30	40	0	70
4	∞	10	70	0

- b) Write how to compute the Binomial Coefficient and derive its time complexity. 7

OR

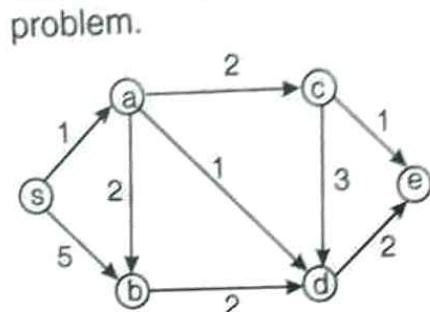


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8. a) State and explain Dijkstras Algorithm to find the single source shortest path

10



b) Construct a Huffman code for the following data :

7

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

9. a) Solve the following instance of the knapsack problem by the branch and bound algorithm :

10

Capacity W = 16

Item	Weight	Profit
1	10	100
2	7	63
3	8	56
4	4	12

b) Apply backtracking to solve the following instance of the subset sum problem
 $S = \{1, 3, 4, 5, 7\}$ and $d = 11$.

7



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IV Semester B.Tech. (CSE/ISE) Degree Examination, September 2022
(CBCS Scheme)

18CIPC 402 : FINITE AUTOMATA AND FORMAL LANGUAGES

Time : 3 Hours

Max. Marks : 100

- Instructions :**
- i) Q. No. 1 is MCQ, **compulsory**.
 - ii) Q. No. 8 and Q. No. 9 are **compulsory**.
 - iii) Answer **any one** question from Q. No. 2 and Q. No. 3.
 - iv) Answer **any one** question from Q. No. 4 and Q. No. 5.
 - v) Answer **any one** question from Q. No. 6 and Q. No. 7.

1. Multiple choice questions : (1×15=15)
- a) Which of the following is not an example of finite state machine system ?
 - i) Control mechanism of an elevator
 - ii) Combinational locks
 - iii) Traffic lights
 - iv) Digital watches
 - b) Can a DFA recognize a palindrome number ?
 - i) Yes
 - ii) No
 - c) When are 2 finite states equivalent ?
 - i) Same number of transitions
 - ii) Same number of states
 - iii) Same number of states as well as transitions
 - iv) Both are final states
 - d) A DFA cannot be represented in the following format
 - i) Transition graph
 - ii) Transition table
 - iii) C code
 - iv) None of the mentioned
 - e) A language for which no DFA exist is a
 - i) Regular language
 - ii) Non-regular language
 - iii) May be regular
 - iv) Cannot be said

P.T.O.



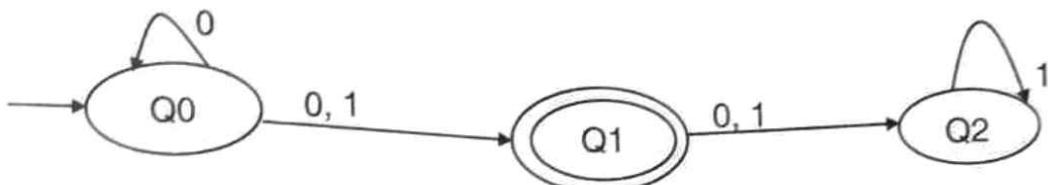
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- f) In context to the process of removing useless symbols, which of the following is correct ?
- We remove the Nullable variables
 - We eliminate the unit productions
 - We eliminate products which yield no terminals
 - All of the mentioned
- g) A turing machine operates over
- Finite memory tape
 - Infinite memory tape
 - Depends on the algorithm
 - None of the mentioned
- h) In order to simplify a context free grammar, we can skip the following operation
- Removal of null production
 - Removal of useless symbols
 - Removal of unit productions
 - None of the mentioned
- i) The password to the admins account = "administrator". The total number of states required to make a password-pass system using DFA would be
- 14 states
 - 13 states
 - 12 states
 - A password pass system cannot be created using DFA
- j) A push down automaton employs _____ data structure.
- Queue
 - Linked list
 - Hash table
 - Stack
- k) A string is accepted by a PDA when
- Stack is empty
 - Acceptance state
 - Both (i) and (ii)
 - None of the mentioned
- l) The following move of a PDA is on the basis of
- Present state
 - Input symbol
 - Both (i) and (ii)
 - None of the mentioned
- m) The class of recursively enumerable language is known as
- Turing class
 - Recursive languages
 - Universal languages
 - RE
- n) A language L is said to be turing decidable if
- Recursive
 - TM recognizes L
 - TM accepts L
 - (i) and (ii)
- o) Language classes have the following property
- Closure property
 - Decision property
 - Closure and decision property
 - None of the mentioned



2. a) Describe the applications of an Automata. 5

b) Convert the following NFA to its equivalent DFA. 7

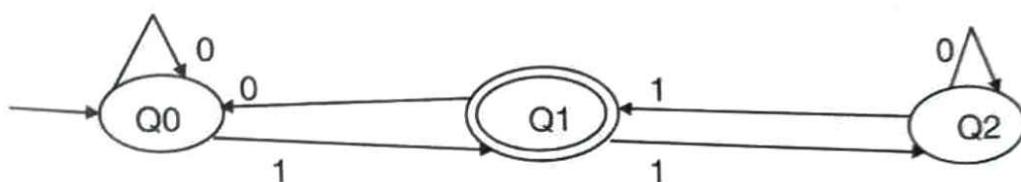


c) Draw a DFA which accepts strings of 0's and 1's ending with the string 011. 5

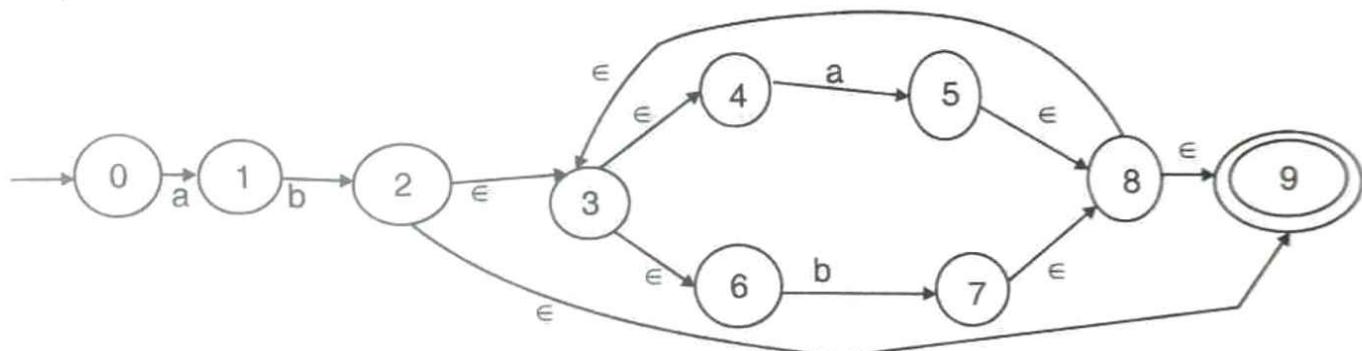
OR

3. a) Compare DFA and ϵ -NFA and give an example for each. 5

b) Which of the strings 0001, 01001, 0000110 are accepted by the DFA shown below ? 3



c) Convert the ϵ -NFA to DFA. 9



4. a) Describe the applications of regular expressions. 5

b) Explain the procedure to reduce the number of states in a DFA. 5

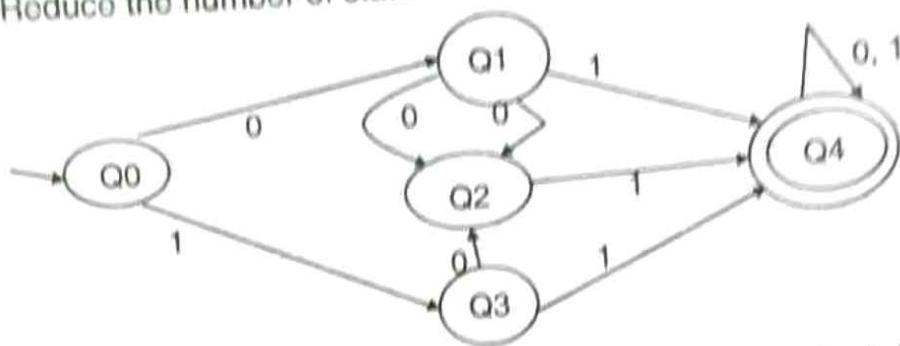
c) Show that the language $L = \{awa : w \in \{a, b\}^*\}$ is regular. 7

OR



5. a) Describe the closure properties of regular languages.

- b) Reduce the number of states in a given DFA.



- c) Find an NFA which accepts $L(r)$, where $r = (a + bb)^* (ba^* + \lambda)$.

6. a) What is a Ambiguous Grammar ? Give example.

- b) Obtain a CFG to generate the following language

$$L = \{01(1100)^n 110(10)^n \mid n \geq 0\}.$$

- c) Eliminate all unit productions from the grammar

$$S \rightarrow S + T/T, T \rightarrow T^*F/F, F \rightarrow (S)/a$$

OR

7. a) Describe Pushdown Automata.

- b) Eliminate useless symbols and productions from the CFG with the following productions from $G = \{V, T, S, P\}$, where $V = \{S, A, B, C\}$ and $T = \{a, b\}$, with P consisting of $S \rightarrow As/AC, A \rightarrow a, B \rightarrow aa, C \rightarrow aCb$.

- c) Construct a Pushdown automata for $L = \{0^n 1^n \mid n \geq 0\}$.

8. a) Construct a PDA that accepts the language generated by a Grammar with productions $S \rightarrow aSbb/a$.

- b) Describe Chomsky Normal Form. Convert the given CFG to Chomsky Normal Form.

$$S \rightarrow AS/AAS, A \rightarrow SA/aa.$$

9. a) Describe the variations of turing machine.

- b) Design a turing machine that accepts $L = \{a^n b^n : n \geq 1\}$.



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(CBCS Scheme)**

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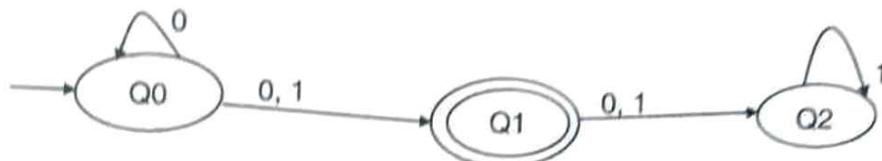
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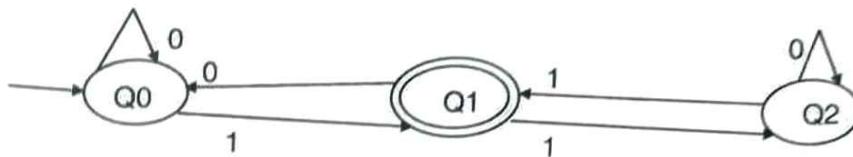
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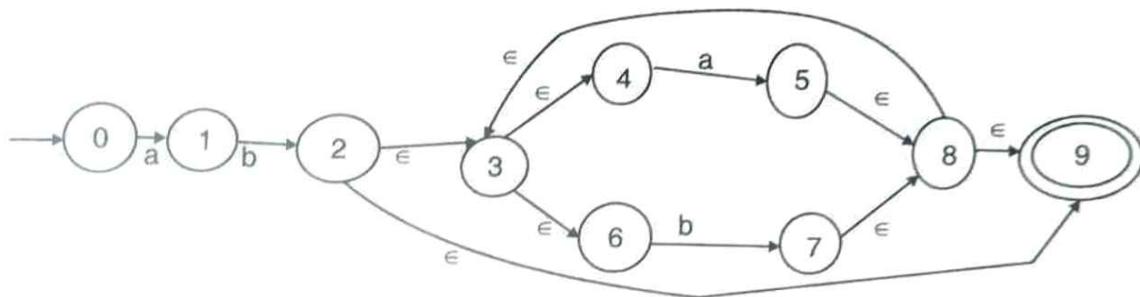


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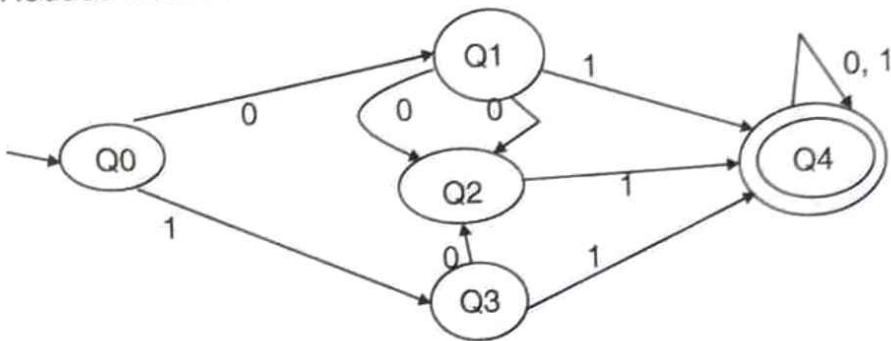


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- b) Design a turing machine that accepts $L = \{a^n b^n : n \geq 1\}$.



JE – 033

VI Semester B.Tech. (CSE/ISE) Degree Examination, September 2022
(CBCS Scheme)

18CIPE62C : WIRELESS NETWORKS (Professional Elective – II)

Time : 3 Hours

Max. Marks : 100

- Instructions :**
- i) Q. No. 1 is MCQ, **compulsory.**
 - ii) Q. No. 2 and 3 are **compulsory.**
 - iii) Answer **any one** question from Q. No. 4 and Q. No. 5.
 - iv) Answer **any one** question from Q. No. 6 and Q. No. 7.
 - v) Answer **any one** question from Q. No. 8 and Q. No. 9.

1. Multiple choice questions : (15x1=15)
- 1) Management frames are used to manage communication between
 - a) Stations and Access Points
 - b) BSS and ESS
 - c) ESS and DS
 - d) All of the above
 - 2) The most common 3G system is
 - a) IS-95
 - b) AMPS
 - c) IMT-2000
 - d) CDMA 2000 1X EV-DO
 - 3) WRT the channel capacity - each channel can be used for one of the below alternative purposes
 - a) One 40Mbps data stream
 - b) 400 channels of 64 kbps each
 - c) Two Analog video signal
 - d) 7 to 9 digital video signal
 - 4) A wireless extension to a wired network can eliminate the need for new _____ to be installed.
 - a) Cables
 - b) Access Point
 - c) Router
 - d) Bridges
 - 5) Electromagnetic waves include
 - a) Microwave rays
 - b) Visible light
 - c) Infrared rays
 - d) All the above

P.T.O.

- 6) A wireless _____ includes and supports the functions of an access point, a wireless switch and a router.
- a) PC card
 - b) Bridge
 - c) Router
 - d) NIC
- 7) The primary and important benefit of wireless communication is
- a) Cost
 - b) Reliability
 - c) Mobility
 - d) Ease of Installation
- 8) Which of the below is a block error-correcting code ?
- a) Automatic Repeat Request
 - b) Piggy backing
 - c) Reed Solomon codes
 - d) OFDM
- 9) A system used to interconnect a set of BSS's and integrated LAN is
- a) Extended Service Set
 - b) Distribution System
 - c) Access point
 - d) None
- 10) IEEE 802.15.4 Protocol is for
- a) WLAN
 - b) Zigbee
 - c) WPAN
 - d) WiMax
- 11) Tunneling is
- a) Identification of prospective home agents
 - b) Inform its home agent of its care-of address
 - c) To forward IP datagrams from a home address to a care-of address
 - d) None
- 12) Which area of the world first deployed cellular services for commercial use ?
- a) Scandinavia
 - b) West Africa
 - c) Central Europe
 - d) North America
- 13) Wireless personal devices are commonly referred to as _____ personal devices.
- a) Mobile
 - b) Integrated
 - c) Digital
 - d) Pocket

- 14) In wireless ad-hoc network
a) Access point is not required
b) Access point is must
c) Nodes are not required
d) All nodes are access points
- 15) Which of the following event is not possible in wireless LAN ?
a) Collision detection
b) Acknowledgement of data frames
c) Multi-mode data transmission
d) Connection to wired networks
2. a) Explain in detail with a block diagram the basic elements of a wireless communication system. 6
- b) Write a brief note on : a) Nyquist channel capacity and b) Shannon channel capacity and the equations defining the same. 6
- c) Explain the 2 multiplexing techniques used in wireless communication in brief. 5
3. a) Define fading in mobile environment and explain briefly the types of fading. 5
- b) Explain with the help of a block diagram an OFDM based system. 6
- c) Explain briefly the general model of spread spectrum digital communication system and write a brief note on FHSS and DSSS. 6
4. a) With the help of a block diagram explain the IEEE 802.11 architecture. 5
- b) Explain in detail the IEEE 802.11 MAC layer describing its 3 functional areas. 6
- c) Draw and explain the block diagram of IEEE 802.11 Protocol Architecture and also explain the IEEE 802.11 MAC logic with the help of a flow diagram. 6
- OR
5. a) Explain MAC frame. Mention the 3 types of MAC frames and write a detailed note on Management Frames. 6
- b) Define WLAN Security. Explain in detail the various technologies used in WLAN Security. 5
- c) Write short notes on : i) Bluetooth, ii) WPAN, iii) Zigbee. 6



6. a) Write a short note on frequency reuse and equation for minimum distance between the Co-channel. 6
b) Briefly explain the operation of the Cellular System and explain the various approaches used for increasing the capacity in a cell. 6
c) Define Handoff and explain in detail the two different types of Handoff's. 5

OR

7. a) Write a note on : i) GSM ii) IS-95 iii) CDMA2000 1x EV-DO, describing the various configuration elements of it. 6
b) Differentiate between Second Generation TDMA and Second Generation CDMA. 5
c) Explain briefly the 4G LTE Architecture and its functional unit the Evolved Packet Core. 6
8. a) With the help of a neat diagram explain the Mobile IP Scenario to handle the dynamic IP addresses. 6
b) Explain the process of Tunneling and any one of the Encapsulation techniques allowed in Mobile IP. 6
c) With the help of a neat diagram derive the equation for the coverage and elevation angles required to obtain the maximum satellite coverage. 5

OR

9. a) Explain briefly how capacity allocation in satellite network is done using frequency division multiple access. Mention the two forms of FDMA. 4
b) Explain with a neat block diagram the IEEE 802.16 architecture. 4
c) Explain the different types of mobile application platform. 4
d) Explain the various steps involved in Mobile app development and deployment. 5

yes

IV Semester B.E
[CSE / ISE]

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IV Semester B.E. (CSE/ISE) Degree Examination, Jan./Feb. 2021
(2K11 Scheme)
CI 43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five full questions, choosing at least two from each Part.

PART – A

1. a) Briefly explain the Computer Architect's view of a computer system. 8
- b) What is a stored program concept ? Explain. 6
- c) List out the advantages of assembly language programming. 6
2. a) Explain the following instruction format in Informal SRC Machine with example : (5x2=10)
 - i) Load and store instruction
 - ii) Rotate instruction.
- b) Explain multiplexed register transfer using gates and strobes. 10
3. a) Explain the various addressing modes of MC 68000. 10
- b) Explain the following : (5x2=10)
 - i) Pipelining technique in RISC Machine
 - ii) Interrupts and traps in SPARC.
4. a) Explain 1-Bus microarchitecture for SRC with neat diagram. 10
- b) Briefly explain the data path implementation in a computer system. 10

PART – B

5. a) Explain the logic of a carry look ahead adder and hence design a 16 bit carry look ahead adder using 4-bit adders. 10
- b) Explain Booth's algorithm, multiply + 15 and - 6 using Booth's multiplication. 10

P.T.O.



6. a) What is Virtual Memory ? With a diagram, explain how Virtual Memory address is translated. 10
- b) Write a short note on : $(5 \times 2 = 10)$
- i) Read Only Memories
 - ii) Cache Memories.
7. a) Describe with a neat diagram, how DMA is used to transfer data from peripherals. 10
- b) What is an Interrupt ? Discuss different types of interrupts. 10
8. Write a short notes on : $(5 \times 4 = 20)$
- i) Display devices
 - ii) Magnetic disk drives
 - iii) Interface circuits
 - iv) Printers.
-

IV Semester B.E.
[CSE/ISE]

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IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)
CI42 : MICROPROCESSORS

Time : 3 Hours

Max. Marks : 100

Instruction : Answer **any five full questions, selecting atleast two from each Part.**

PART – A

1. a) Define a processor. Explain the different register set of 8086 microprocessor. 10
b) Write a note on pipelining. 5
c) Mention the differences between real mode and protected mode memory system. 5
2. a) Explain the segmented memory and mention its advantages. 8
b) Explain the following addressing modes with examples. 6
i) Scaled-indexed addressing mode
ii) Relative addressing mode
c) Discuss the importance of protected mode memory addressing. 6
3. a) Explain the branching instructions used in 8086 microprocessor with examples. 10
b) Write a program for 8086 microprocessor to sort N elements stored in an array using bubble sort. 10
4. a) Explain the various assembler directives used in 8086 microprocessor with examples. 10
b) Write a program for 8086 microprocessor to search a key element in an 16 bit array using binary search. 10

PART – B

5. a) Differentiate between macros and procedures. 6
b) Write a mixed language program that converts binary to ASCII. 7
c) What is modular programming ? Explain with suitable example. 7

P.T.O.

6. a) Explain the functions of following pins in 8086. 5
- i) MN/M \bar{X}
 - ii) ALE
 - iii) INTR
 - iv) RESET
 - v) READY
- b) Bring out the differences between 8086 and 8088 microprocessors. 5
- c) Explain the timing diagram for WRITE operation in 8086 microprocessor. 10
7. a) Interface 8K X 8 ROM and 4K X 8 RAM to 8086 processors. Assume that the starting address for ROM is 40000 and that for RAM is 44000. 10
- b) Compare memory mapped I/O and I/O mapped I/O interfacing techniques. 5
- c) What is address latching ? Explain how address latching takes place in 8086. 5
8. a) Explain with a neat block diagram the working operation of 8255 PPI. 10
- b) Explain the control word register of 8254 programmable interval timer. 5
- c) Explain 8259 programmable interrupt controller. 5
-

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)
CI44 : DESIGN AND ANALYSIS OF ALGORITHMS

Max. Marks : 100

Time : 3 Hours

Instruction : Answer **five** complete questions selecting atleast **two** from **each** Part.

PART – A

1. a) Define algorithm. Explain with a flowchart, the process of algorithm design and analysis. 10
b) With an algorithm derive the time complexity of converting decimal to binary. 5
c) Define Big O notation. Express the $F(n) = 10n^3 + 5$ using Big O notation. 5
2. a) What is exhaustive search ? Obtain the optimal solution for the given Knapsack problem $M = 5$, weight [] = [2, 1, 3, 2] and profit [] = [20, 5, 25, 15]. 10
b) Explain Closest-pair problem with an algorithm. Derive its Time complexity. 10
3. a) Write an algorithm to sort an array using Quick sort. Derive its complexity. 10
b) Explain how divide and conquer technique can be applied to multiply two large integers. Find its time complexity. 10
4. a) Write a program for Breadth First Search. Give its time complexity. 10
b) Explain how the following techniques can be used in topological sort. 10
 - i) Source removal method
 - ii) DFS method.

PART – B

5. a) Define AVL tree. With example, explain various rotations used to balance an AVL tree. 10
b) Construct 2-3 Tree for the input A, L, G, O, R, I, T, H, M. 5
c) Search pattern BAOBA in a text BESS-KNEW-ABOUT-BAOBABS using Horspool String Matching Technique. 5

P.T.O.



6. a) Apply Warshal's algorithm to check whether the graph is connected or not for the given adjacency matrix. Write the algorithm and find its time complexity. 10

	a	b	c	d
a	0	1	1	0
b	1	0	0	0
c	1	0	0	1
d	0	0	1	0

- b) Obtain an optimal solution for the following Knapsack problem.

Given M = 5

Weight [] = [2, 1, 3, 2] and Profit [] = [10, 12, 20, 15]

10

7. a) Write an algorithm to obtain a MST using Kruskal's method. Give its time complexity. 10

- b) Construct an Huffman tree for the following data and encode

aabbcdacd@abcd@aa

10

Character a b c d @

Probability 0.3 0.2 0.25 0.15 0.1

8. Write short notes on : **(5x4=20)**

- a) N Queens problem
 - b) NP complete and NP Hard problem
 - c) B trees
 - d) Presorting.
-

**IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)**

CI 46 : JAVA AND INTERNET PROGRAMMING

Max. Marks : 100

Time : 3 Hours

Instruction : Answer any five questions choosing at least two from each Part.

PART – A

1. a) Illustrate Java constructors with an example code. 5
b) Write a program and define a class called 'Box' with members as length, breadth and height. Initialize the parameters and write a method to compute the volume. 8
c) Discuss the following : 7
 - i) Abstract class
 - ii) Interface.
2. a) Demonstrate method overriding in Java with an example program. 10
b) What are the methods used for Input/Output operation in Java ? 5
c) How is polymorphism achieved in Java ? 5
3. a) Define strings. Discuss any five string handling functions in Java. 10
b) Discuss exceptions in Java. Write a program to illustrate try, catch and finally in Java. 10
4. a) Write a Java program to change thread priorities. 10
b) Explain producer-consumer problem. 5
c) What are applets ? 5

PART – B

5. a) Explain scalar operations in Perl. 5
b) Explain the following in perl with example program. 9
 - i) Arrays
 - ii) Hashes
 - iii) Functions.
- c) What is a query string ? How is a query string transmitted to the server with the post method ? 6

P.T.O.

6. a) Discuss the five most commonly used HTTP methods and their purposes. 5
- b) Illustrate with an example the standard XHTML document structure. 9
- c) Give the syntax and example for the following tags.
- i) <pre>
 - ii) <a>
 - iii) <sub>. 6
7. a) Write an XHTML document and java script function to compute and print Fibonacci series. 10
- b) Explain primitive data types, input and output operations of java scripts. 10
8. a) Write an XHTML document which displays a form containing text elements to input employee name, emp-id, no-of-days-working, salary. Develop a java script to compute the salary to be paid on button click and display. 10
- b) Explain the three phases of event processing in the DOM2 event model. 10
-

IV Semester B.E. (CSE/ISE) Degree Examination, June/July 2017
 (2K11 Scheme)

CI43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3 Hours

Max. Marks : 100

Instruction : Answer **five full** question selecting atleast **two from each Part.**

PART – A

1. a) Define the following terms. 6

- i) Instruction Set Architecture (ISA) and its components.
- ii) Fetch-execute cycle.
- iii) Simulator and emulator.

b) Explain briefly the salient features of the computer architects view of a computer system. 6

c) Discuss the computer hardware progress evolved through various generation of a computer system. 8

2. a) With a neat diagram, explain the memory read and memory write operation of a computer. 4

b) Evaluate the following expression X, using 1 and 0 addressing machine 4

$$X = a + (b * c).$$

c) Explain meaning of the following instructions in informal SRC machines. 4

- i) ld ra, c2 (rb)
- ii) shr ra, rb, rc
- iii) brl ra, rb, rc, c3
- iv) neg ra, rc.



P>>>

- d) From the following snapshot of addressing modes of a machine, compute the contents of register R_0 , after execution of each instruction. 8

Machine State

Address	Value
PC	100
R_0	200
R_1	300
100	200
200	500
300	600
500	700

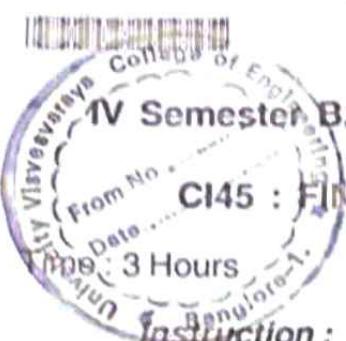
Instruction	Contents of R_0
1. Load R_1 , # 200	?
2. Load R_1 , 200	?
3. Load R_1 , (200)	?
4. Load R_1 , [R_1]	?
5. Load R_1 , 200[PC]	?

3. a) Differentiate between CISC and RISC machines. Discuss important strategies considered during the design of RISC system. 10
- b) Describe with a neat figure, working principle of a register window mechanism of a SPARC machine. 10
4. a) Explain briefly the data path implementation in a computer system. 10
- b) Describe concrete RTN of the SRC reset operation in 1 – bus SRC. 10

PART – B

5. a) What are the disadvantages of a ripple carry adder ? Discuss how this problem is addressed by carry-look-ahead-adder. 8
- b) Perform the following computation.
- Represent the decimal No. +45 in single precision and double precision IEEE floating point notation. 4
 - Perform multiplication of MPR = (-9) and MCND = (10) using Bit-pair Recoding Method. 4
 - Perform the addition of $22_{(10)}$ and $42_{(10)}$ in floating point numbers. 4

- 
6. a) With a neat diagram, explain the design of a ROM cell. 4
 b) Discuss the memory Hierarchy of a computer. Discuss the salient feature of direct mapped cache memories. 8
 c) What is virtual memory ? Discuss in detail how mapping is done using paging technique. 8
7. a) Distinguish between memory mapped I/O and I/O mapped I/O. 4
 b) Explain briefly the various methods of handling interrupt in multiple I/O devices connected to a computer. 6
 c) What is DMA ? Explain with a neat diagram, the centralized bus arbitration using daisy chain arrangement. 10
- (4×5=20)
8. Write short notes on :
 i) Bench mark programs
 ii) Classification of computers
 iii) Buses
 iv) Display Devices.
-



IV Semester B.E.
[CSE/ISE]

BE - 161

**IV Semester B.E. (CSE/ISE) Degree Examination, December 2016
(2K11 Scheme)**

CI45 : FINITE AUTOMATA AND FORMAL LANGUAGES

Max. Marks : 100

Instruction : Answer **any five full questions selecting atleast two questions from each Part.**

PART - A

1. a) Design a DFA to accept Language

$L = \{W/W \text{ has add number of 0's and odd No. of 1's over } \Sigma = \{0, 1\}\}$. Draw transition diagram. 4

- b) Convert the following NFA to DFA. 7

δ_{NFA}	0	1
$\rightarrow p$	$\{p, q\}$	p
q	r	r
r	\$	\emptyset
* \$	\$	\$

- c) Differentiate between NFA and DFA. 4

- d) Define : 5

- i) Grammar
- ii) Input alphabet
- iii) Language
- iv) String
- v) Automata

2. a) Write 5 different applications of Finite Automata. 3

- b) Design Regular expressions for the following Languages :

i) $L = \{ W \mid |W| \bmod 3 = 0 \text{ over } \Sigma = \{a, b\}\}$.

ii) Every pair of adjacent 0's appears before any pair of adjacent 1's over $\Sigma = \{0, 1\}$.

iii) The set of strings 0's of 1's whose 10th symbol from right end is 1. 5

P.T.O.

c) Design an ϵ – NFA to accept the decimal numbers.

d) Convert the following ϵ – NFA to DFA.

	ϵ	a	b
$\rightarrow p$	{r}	{q}	{p, r}
q	ϕ	{p}	ϕ
r	{p, q}	{r, s}	{p}
*s	{p}	{p}	{p}

3. a) Convert the following regular expression to an equivalent finite automata. 6

i) $(a + b)^*ab$

ii) $(0 + 1)^*|(0 + 1)$.

b) Construct the minimum state equivalent DFA using table filling algorithm. 10

	0	1
$\rightarrow A$	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

c) Obtain regular expressions from the following DFA using state elimination method. 4



4. a) Grammar

$$S \rightarrow aS/aSbS/\epsilon$$

Is the above grammar ambiguous show in particular that string "aab" has two :

- i) Parse tree
- ii) Left most derivation
- iii) Right most derivations.

6

b) Design Grammar for the following Language :

- i) $n_a(w) = nb(w)$
- ii) String with no more than 3 a's over $\Sigma = \{a, b\}$
- iii) $n_a(w) > nb(w)$
- iv) $a^n b^{2n} n \geq 1$ over $\Sigma = \{a, b\}$.

8

6

c) State and prove pumping Lemma for context-free Languages.

PART – B

5. a) Define PDA. Discuss the Language accepted by PDA. Design non-deterministic PDA for the Language $L = \{0^n | n \geq 1\}$. Show moves for string $0^5 1^5$. 10

b) Convert the grammar

$$S \rightarrow OSI/A$$

$$A \rightarrow AO/S/\epsilon$$

to a PDA that accepts same language by empty-stack. Show the moves for string '001'. 10

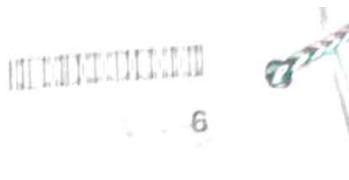
6. a) What are useless symbols ? Eliminate useless symbols from the following grammar ? 6

$$S \rightarrow aA/cB$$

$$A \rightarrow aA/b$$

$$B \rightarrow cB$$

$$D \rightarrow ab/Ec$$



- b) Define CNF. Convert the following grammar CNF.

$$S \rightarrow aSb/Aa$$

$$A \rightarrow aab$$

- c) Obtain Nullable set and hence eliminate all ϵ -productions from the following grammar:

$$S \rightarrow aAa/AB$$

$$A \rightarrow BS/aBa/\epsilon$$

$$B \rightarrow aB/\epsilon$$

7. a) Define Turing Machine. Discuss multitape turing machine.

- b) Design a Turing Machine to accept Language $L = \{ 0^n 1^n 2^n : n \geq 1 \}$. Write a transition diagram and give instantaneous description for the input '012.

- c) Design Turing Machine to accept the language $L = \{ WW^R | W \in \{a, b\}^* \}$.

8. a) Show that recursive languages are closed under Union and Intersections.

- b) Show that the following PCP has no solution.

	List A	List B
i	w _i	x _i
1	10	101
2	011	11
3	101	011

- c) Prove that if Language E is recursive, then \bar{E} is also recursive.

IV Semester B.E. (CSE/ISE) Degree Examination, December 2011
(2K11 Scheme)
CI 44 : DESIGN AND ANALYSIS OF ALGORITHMS

Max. Marks : 100

Time : 3 Hours

Instruction : Answer any five questions, selecting at least two from each Part.

PART – A

1. a) With a neat flow diagram, explain the typical sequence of steps in designing and analysis of an algorithm. 10
1. b) Explain the concept of asymptotic notations, indicating the commonly used notations with examples. 10
2. a) Give the general plan for analyzing the time efficiency of recursive algorithms. If $M(n)$ denotes the number of moves in tower of Hanoi puzzle, when 'n' disks are involved, give the recurrence relation for $M(n)$. Design and analyze the algorithm for the tower of Hanoi problem. 10
2. b) Find the optimal solution for the following instance of the Knapsack problem, using Brute force technique
 $n = 4; M = 6;$
 $\{W_1, W_2, W_3, W_4\} = \{2, 3, 1, 2\}$
 $\{P_1, P_2, P_3, P_4\} = \{10, 15, 12, 18\}$. 10
3. a) Explain Strassen's matrix multiplication taking example of multiplying
 $A = \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 7 \\ 1 & 2 \end{bmatrix}$. Obtain its time complexity. 10
3. b) Sort the following elements using Merge sort :
535, 333, 456, 378, 498, 488, 512, 215, 178, 413.
Write the algorithm and obtain its time complexity. 10

P.T.O.

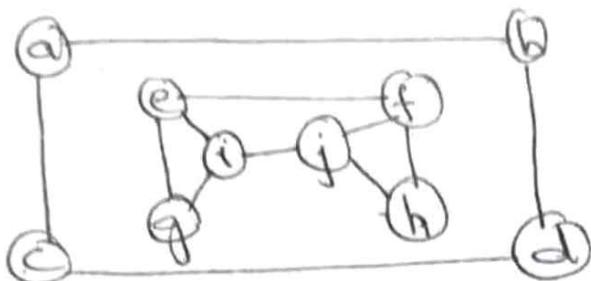


4. a) Explain the three major variations of decrease and conquer technique, with examples.

10

- b) Design an algorithm to traverse the graph using BFS method. Show the traversal for the following graph :

10



PART - B

5. a) Write an algorithm for presort element uniqueness in an array and analyze its efficiency.

10

- b) Construct an AVL tree for the following list of elements :

25, 21, 28, 24, 27, 26, 22, 29, 23.

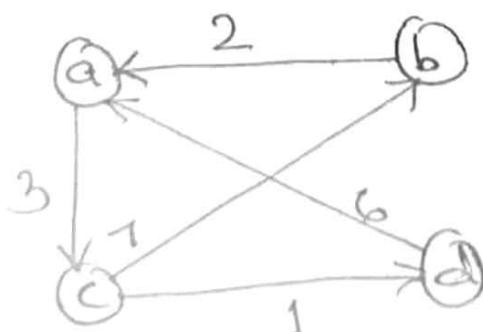
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6. a) Write an algorithm to compute the binomial coefficient using dynamic programming technique. Compute 6C_3 .

10

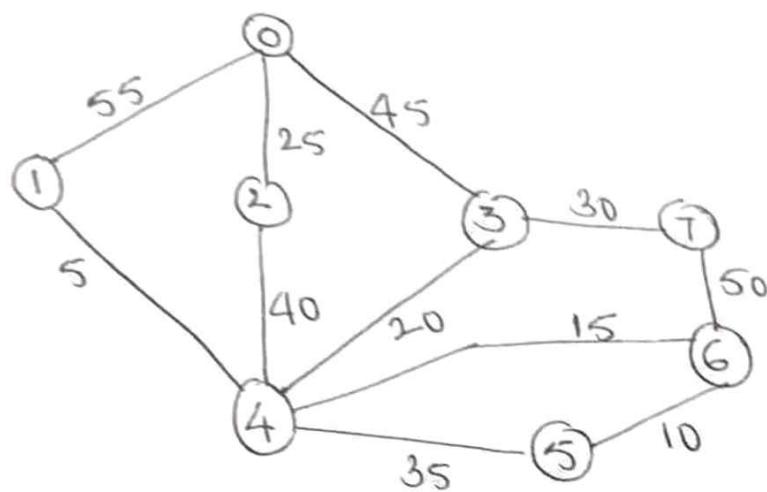
- b) Apply Floyd's algorithm to find all pairs shortest paths for the graph shown below :

10



QUESTION

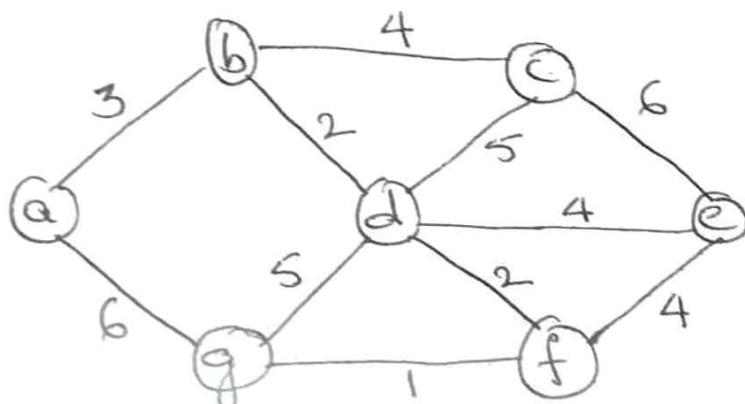
7. a) Apply Kruskal's algorithm to find the minimum spanning tree for the following graph : -3- BE - 160



10

4

- b) Solve the single source shortest path problem using Dijkstra's algorithm by considering 'a' as the source. 4



10



8. a) Solve the Knapsack problem using Branch-and-Bound technique :

Item	Weight	Value
1	4	40
2	7	42
3	5	25
4	3	12

Total capacity of the Knapsack $W = 10$.

10

- b) Solve the subset-sum problem using backtracking technique. Show the state space tree :

$$S = \{1, 3, 4, 5\}$$

10

$$d = 11 ;$$

IV Semester B.E. (CSE/ISE) Degree Examination, December 2016
 (2K11 Scheme)
CI 42 – MICROPROCESSORS

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five questions, selecting atleast two from each Part.

PART – A

1. a) With a neat block diagram, explain the architecture of 8086 Microprocessor. 10
- b) Explain any three significant bits of flag register of 8086 Microprocessor with an example. 6
- c) What is Segmented Memory ? What are the advantages of segmented memory ? 4
2. a) Explain the following addressing modes with examples : 10
 - i) Immediate addressing mode
 - ii) Register addressing mode
 - iii) Memory addressing mode
 - iv) Implied addressing mode
 - v) I/O port addressing mode
- b) Let DS = 3080, CS = 0000H, SI = 0008H and IP = 00FFH. What is the address of the instruction that is fetched ? What is the address of the data ? 4
- c) Explain the segment registers and their purpose in the operation of the microprocessor. 6
3. a) Explain the shift instructions used in 8086 microprocessor with example. 6
- b) Write an assembly language program to find the largest and smallest element in an array. 8
- c) Explain the following assembler directives with examples. 6
 - i) DW
 - ii) GLOBAL
 - iii) EQU
 - iv) OFFSET
 - v) ASSUME
 - vi) LENGTH.

P.T.O.

4. a) Explain the string instructions used in 8086 microprocessor. 7
 b) Write an assembly language program to check whether the given string is palindrome or not. 8
 c) What is Macro ? How it is different from procedure ? Explain. 5

PART – B

5. a) Define procedure. What are the different ways of passing parameters ? Explain with example. 7
 b) Explain how memory is organised in 8086 microprocessor. 7
 c) Write an assembly language program to search a key element in an array using linear search method. 6
6. a) With a functional block diagram, explain 8086 based microcomputer operating in maximum mode. 10
 b) Draw and explain the timing diagram for WRITE operation in 8086 microprocessor. 10
7. a) What is data buffering ? Explain the data buffering mechanism in 8086. 7
 b) Explain the architecture of 8255 PPI with a functional block diagram. 7
 c) Given 4K RAM, write an interfacing circuit for 8086 to realize a memory of 16 K starting at the address 9000 H. 6
8. a) What are Interrupts ? What are the different types of Interrupts ? Explain the Interrupt Vector Table (IVT) of 8086. 8
 b) Write a short note on Direct Memory Access (DMA). 5
 c) Explain the 8259 programmable Interrupt controller interfacing with 8086 microprocessor. 7
-



IV Semester
CSE/ISE

BE - 162

B.E. (CSE/ISE) Degree Examination, December 2016
(2K11 Scheme)
CI 46 : JAVA AND INTERNET PROGRAMMING

Time : 3 Hours

Max. Marks : 100

Instruction: Answer 5 questions selecting at least two from each Part.

PART – A

1. a) What is Java bytecode ? Which internet programming problems can be solved using bytecode ? Explain. 5
- b) Write a Java program to find out the factorial of a given number using recursion. 5
- c) What is the difference between method overloading and method overriding ? Illustrate with examples. 10
2. a) Write a Java program to illustrate how data members and methods are inherited ? 10
- b) Explain with an example, the concept and conditions associated with the super () method. 10
3. a) What are a various methods that operate on strings ? Explain. 10
- b) What is exception handling ? Write a Java program that simulates a customer of a virtual cafe drinking a cup of coffee. Consider the exceptional conditions that might occur while the customer sips. 10
4. a) Explain the methods used to support interthread communications. 5
- b) What are the uses of threads ? Explain any one method to create and run a thread with an example. 10
- c) Explain the applet life cycle. 5

P.T.O.



PART – B

- | | |
|----------------------------------------------------------------------------------------------------------------------------|----|
| 5. a) Explain the different categories of perl variables with examples. | 5 |
| b) In what three fundamental ways do Perl arrays differ from the arrays of other common high level programming languages ? | 5 |
| c) Write a Perl program to illustrate how a query string is transmitted to the server with the get method. | 10 |
| 6. a) How XHTML differs from HTML ? | 5 |
| b) How to create images, hypertext links and lists in XHTML. | 5 |
| c) Create, test and validate an XHTML document to describe an ordered list of your five favorite movies. | 10 |
| 7. a) Assume an array name list in alphabetical order, write a Java script to insert a new name and order the name list. | 10 |
| b) Describe with an examples, the two ways to embed a Javascript in an XHTML document. | 10 |
| 8. a) Explain the three phases of event processing in the DOM 2 event model. | 10 |
| b) How to handle events in Java scripts ? List out events, event attributes and their tag. | 10 |
-

IV Semester I.T.
[CSE/ISE]

BE - 159

IV Semester B.E. (CSE/ISE) Degree Examination, Dec. 2016
(2K11 Scheme)

CI 43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Max. Marks : 100

Time : 3 Hours

Instructions : Answer any five questions selecting atleast two from each Part.

PART - A

1. a) Discuss the salient features of a general purpose machine. 4
b) Explain progress in computer hardware through the various generations of computers. 8
c) What are the different classification of computer ? Evaluate $A = (b + c) * (d - e)$ using 1-address and 0-address machine. 8

2. a) Explain briefly load, Add, shift instruction format in informal description of the simple RISC computer. 8
b) Explain the following addressing modes with RTN (write the syntax).
i) Register indirect addressing mode.
ii) Relative addressing mode. 4
c) Assume the following state of affair of the byte addressed machine. 8

Address	Value
PC	100
R ₀	200
R ₁	300
100	200
104	300
108	400
200	500
300	600
500	700

P.T.O.

Find the value of R_0 after execution of each instruction is given below.

Instruction	Addressing mode	Value of R ₀
1) Load R ₀ , 200	Direct	?
2) Load R ₀ , # 200	Immediate	?
3) Load R ₀ , R ₁	Register	?
4) Load R ₀ , 200 [PC]	Relative	?

3. a) Discuss the characteristic features and performance measurement of a machine. 10
 b) Discuss philosophy of machine design of RISC and CISC system. 10

4. a) Explain with a neat block diagram the high level view of the 1-BUS SRC design. 10
 b) Discuss data path implementation in processor design. 10

PART - B

5. a) Multiply the following using booth multiplication algorithm. 8
 Multiplier = $(+13)_{10}$
 Multiplicand = $(-9)_{10}$.

b) Explain with a neat diagram, the hardware circuit arrangement for binary division (restore/non restore). 8

c) Represent $(45)_{10}$ using single precision IEEE format. 4

6. a) Explain the following : 10
 i) Semiconductor memory
 ii) Cache memory
 iii) Direct mapping.

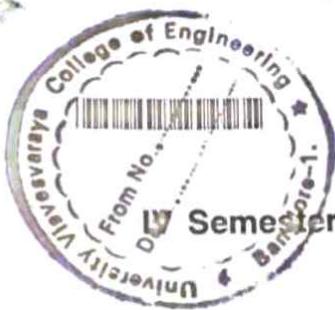
b) Explain virtual memory and its importance in memory management. 10

7. a) What is memory mapped I/O ? Explain with a neat block diagram, the DMA daisy chain bus arbitration mechanism. 10

b) Discuss briefly on I/O data format and error control in I/O system. 10

8. Write short notes on : $(4 \times 5 = 20)$

i) RTN	ii) Machine exceptions
iii) Magnetic disk drive	iv) Printers.



IV
Semester B.E.
CSE / ISE

UJ - 158

Semester B.E. (CSE/ISE) Degree Examination, June/July 2017
(2K11 Scheme)
CI 42 : MICROPROCESSORS

Time : 3 Hours

Max. Marks : 100

Instruction: Answer any five questions, selecting atleast two from each Part.

PART - A

1. a) What is a Microprocessor ? Explain the register set of 8086 Microprocessor. 10
b) Explain the architecture of 8086 Microprocessor with a neat block diagram. 10
2. a) Explain the various addressing modes of 8086 with examples. 12
b) Explain any four significant bits of flag register of 8086 Microprocessor with an example. 8
3. a) Explain the following instructions with examples (5×2=10)
 - i) MOV
 - ii) CMP
 - iii) LOOP
 - iv) XCHG
 - v) AAA
b) Explain the Rotate instructions used in 8086 microprocessor with examples. 5
c) Write an assembly language program to find the factorial of a number. 5
4. a) What are Assembler directives ? List and explain the assembler directives used in the 8086 Microprocessor. 8
b) What is a procedure ? What are the different ways of passing parameters ? Explain with example. 8
c) What are the differences between a macro and a procedure ? 4

P.T.O.

PART – B

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 5. a) What is modular programming ? Explain with suitable examples how it can be achieved ? | 5 |
| b) Write an ALP to sort a given set of numbers in ascending order using Bubble sort algorithm. | 8 |
| c) Explain the Physical Memory organization of 8086 Microprocessor. | 7 |
| 6. a) With a functional block diagram, explain 8086 based microcomputer operating in minimum mode. | 10 |
| b) Draw and explain the timing diagram for READ operation in 8086 Microprocessor. | 10 |
| 7. a) What is address latching ? Explain how address latching takes place in 8086 ? | 6 |
| b) Explain the architecture of 8255 PPI with a functional block diagram. | 7 |
| c) Given $1\text{ K} \times 8$ RAM chip, design an interfacing circuit for 8086 microprocessor to realize a memory map of $1\text{ K} \times 16$ (16-bit) memory. The given address is 80000H. | 7 |
| 8. Write short note on : | $(5 \times 4 = 20)$ |
| a) Control word Register of 8255 PPI. | |
| b) Interrupt Vector Table. | |
| c) 7-segment display device. | |
| d) Logic controller interfacing with 8086. | |

**IV Semester B.E. (CSE/ISE) Degree Examination, August 2021
(2K11 Scheme)**
CI 44 : DESIGN AND ANALYSIS OF ALGORITHMS

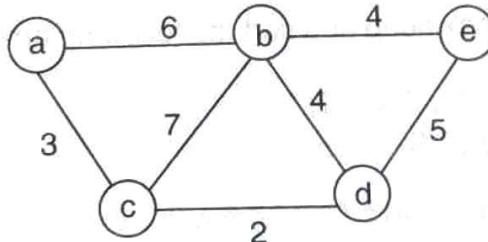
Time : 3 Hours

Max. Marks : 100

Instruction : Answer **any five full** questions selecting atleast **two** from each Part.

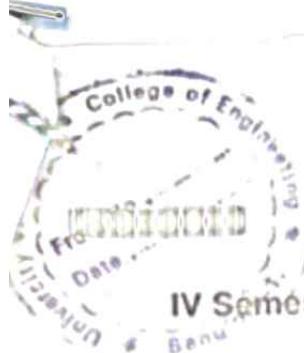
PART – A

1. a) What is an algorithm ? Explain the various stages of algorithm design and analysis process with a flow chart. 8
- b) Write the general plan for analyzing non-recursive algorithms with example. 8
- c) Solve the following recurrence relation :
 $x(n) = x(n/2) + n$ for $n > 1$, $x(1) = 1$. 4
2. a) Give the algorithm for Brute-Force string matching and obtain its time complexity. 7
- b) Write a short note on Convex-Hull problem. 5
- c) Find the minimum tour cost of travelling salesman problem using exhaustive search. 8



3. a) Write an algorithm for merge sort and derive its complexity. 7
- b) Sort the following array of integers using quick sort :
67, 55, 35, 99, 11, 88, 22, 87, 23, 48 7
- c) Explain how to multiply two long integers using divide and conquer method. 6

P.T.O.



IV Semester B.E [CSE]
[CSE / ISE]

BE - 169

IV Semester B.E. (CSE/ISE) Degree Examination, August 2021
(2K11 Scheme)

CI 43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Max. Marks : 100

Time : 3 Hours

Instruction : Answer any five full questions, choosing atleast two from each Part.

PART – A

1. a) List and explain the different addressing modes to access operands in a system. 8
b) Explain Fetch-Execute process of an instruction with an example. 6
c) Discuss the characteristic features of the user's and programmer's view of computer system. 6
2. a) Explain the following instruction format in informal SRC machine with example. 10
i) Branch Instruction.
ii) Shift Instruction.
b) Give the assembly language equivalent for the expression $a = (b + c) - (d * e)$ on a 3-address, 2-address, 1-address and 0-address machine. 10
3. a) Explain machine characteristics and performance of a computer system. 10
b) Write the differences between CISC and RISC machines. 6
c) Explain pipelining technique in RISC machine. 4
4. a) Briefly explain the design of control unit of a computer system. 10
b) Write a short note on the following :
i) Machine Check Exception.
ii) Data Access Exception. 10

PART – B

5. a) Explain the sequential binary multiplier circuit with an example. 10
b) Solve the following :
i) +1.765 represent in IEEE format using single precision technique.
ii) Perform non-restoring division for 3 and 8. (5x2=10)

P.T.O.

BE – 169

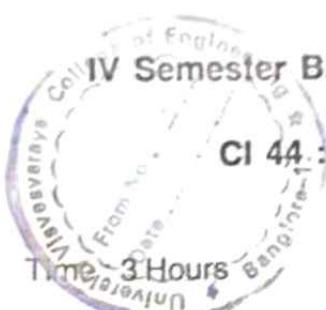


6. a) Describe any two mapping functions in cache. 10
b) Explain how do you configure a 256 MB DRAM chip as 64 M * 4 chip. 10
7. a) What is an Interrupt ? What are interrupt service routines and what are vectored interrupts ? Explain with example. 10
b) Describe with a neat diagram, how DMA is used to transfer data from peripherals. 10
8. a) Explain the organization and access of data on a disk drive.
b) Write a short notes on the following :
 i) Interface circuits.
 ii) Buses. (5×2=10)

IV Semester B.E.

[CSE(ISE)]

BE - 160



Instruction : Answer any five questions, selecting at least two from each Part.

Max. Marks : 100

PART - A

1. a) With a neat flow diagram, explain the typical sequence of steps in designing and analysis of an algorithm. 10
 - b) Explain the concept of asymptotic notations, indicating the commonly used notations with examples. 10

 2. a) Give the general plan for analyzing the time efficiency of recursive algorithms. If $M(n)$ denotes the number of moves in tower of Hanoi puzzle, when 'n' disks are involved, give the recurrence relation for $M(n)$. Design and analyze the algorithm for the tower of Hanoi problem. 10
 - b) Find the optimal solution for the following instance of the Knapsack problem, using Brute force technique
- $n = 4; M = 6;$
 $\{W_1, W_2, W_3, W_4\} = \{2, 3, 1, 2\}$
 $\{P_1, P_2, P_3, P_4\} = \{10, 15, 12, 18\}.$ 10
3. a) Explain Strassen's matrix multiplication taking example of multiplying $A = \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 7 \\ 1 & 2 \end{bmatrix}$. Obtain its time complexity. 10
 - b) Sort the following elements using Merge sort:
 535, 333, 456, 378, 498, 488, 512, 215, 178, 413.
 Write the algorithm and obtain its time complexity. 10

P.T.O.



8. a) Solve the Knapsack problem using Branch-and-Bound technique :

Item	Weight	Value
1	4	40
2	7	42
3	5	25
4	3	12

Total capacity of the Knapsack $W = 10$.

10

- b) Solve the subset-sum problem using backtracking technique. Show the state space tree :

$$S = \{1, 3, 4, 5\}$$

$$d = 11;$$

10

**BE-172**

IV Semester B.E. (CSE/ISE) Examination,
December - 2019/January - 2020
(2K11 Scheme)

CI45 : Finite Automata and Formal Languages

Max. Marks : 100

Time : 3 Hours

Instruction : Answer any five full questions, selecting at least two from each part.

PART - A

7

1. (a) Define the following terms :

- | | |
|--------------|---------------|
| (i) Grammar | (ii) Language |
| (iii) String | (iv) Automata |

- (b) Define grammar for the language over $\Sigma = \{a, b\}$ $L = \{ w : na(w) = nb(w) \}$

5

- (c) Obtain DFA for the following NFA :

8

	A	b
$\rightarrow q_0$	q_0, q_1	q_0
q_1	-	q_2
$* q_2$	-	-

2. (a) Draw an NFA accepting the language generated by the grammar with 8 productions.

$$S \rightarrow abA \mid bB \mid aba$$

$$A \rightarrow b \mid aB \mid bA$$

$$B \rightarrow aB \mid aA$$

What is the language accepted by the above grammar ?

4

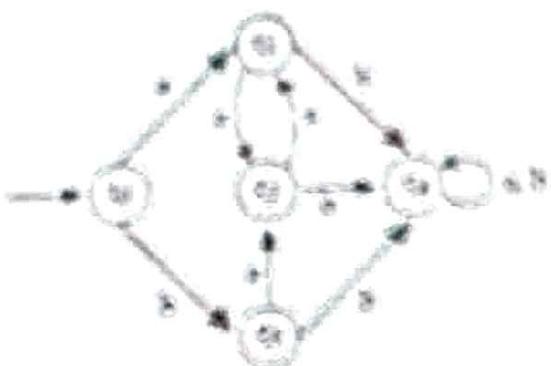
- (b) Design an ϵ - NFA to accept decimal numbers.

- (c) Prove that the language L is accepted by DFA iff L is accepted by an ϵ - NFA.

8

P.T.O.

- Q. (a) Obtain a regular expression for
 (i) Languages L_1 and L_2
 (ii) strings of 0's and 1's which are multiples of 10.
 (b) Find the minimum state function automata of the following DFA.



- ३०) विनायक चतुर्थी का जन्म के बारे में कौन सी विवरणों की सही विवरणों से सम्मिलित है ?

 - प्रथम विनायक चतुर्थी का जन्म शूक्रवारी को होता है।
 - द्वितीय विनायक चतुर्थी का जन्म शूक्रवारी को होता है।
 - तृतीय विनायक चतुर्थी का जन्म शूक्रवारी को होता है।
 - चौथी विनायक चतुर्थी का जन्म शूक्रवारी को होता है।

第二章

- Q. (a) Consider the set of all points (x, y) such that $x^2 + y^2 = 1$. Show that the set consists of all points which lie on the boundary of unit circle.

(b) Define $\mathcal{C}(\mathbb{R})$ as the set of continuous functions:

 - (i) $\mathcal{C}_1(\mathbb{R})$ is the set of differentiable functions.
 - (ii) $\mathcal{C}_2(\mathbb{R})$ is the set of twice differentiable functions.
 - (iii) $\mathcal{C}_3(\mathbb{R})$ is the set of three times differentiable functions.
 - (iv) $\mathcal{C}_4(\mathbb{R})$ is the set of four times differentiable functions.



3

BE-172

6. (a) Show that $L=\{a^n b^n c^n \mid n \geq 0\}$ is not context free. 6
(b) State and prove pumping lemma for context free languages. 6
(c) Convert the following grammar into GNF. 8
- $S \rightarrow AB1 \mid 0$
 $A \rightarrow 00A \mid B$
 $B \rightarrow 1A1$
7. (a) Obtain a Turing machine to accept the language $L=\{0^n 1^n 2^n \mid n \geq 1\}$. Write transition diagram. 10
(b) Obtain right linear and left linear grammar for the following : $(0+1)^* 00(0+1)^*$. 10
8. (a) Show that recursive languages are closed under Union and Intersections. 8
(b) Prove that the halting problem is unsolvable. 12

- o O o -



BE-171

IV Semester B.E. (CSE/ICE) Examination
December - 2019/January - 2020
(2K11 Scheme)

CI44 : Design and Analysis of Algorithms

Max Marks: 100

Time : 3 Hours

Instruction : Answer five complete questions selecting at least two from each part.

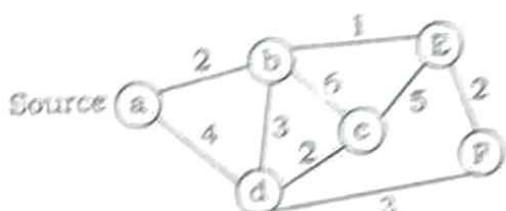
PART - A

1. (a) Define Algorithm. Explain the process of Algorithm Design and Analysis. 6
- (b) State the various Asymptotic notations used to find the time complexity of an Algorithm. 6
- (c) Write a non-recursive algorithm to solve the following problems and derive its time complexity. 8
 - (i) To multiply two matrices
 - (ii) To check the uniqueness of elements in an array
2. (a) Show how Divide and Conquer technique can be used to multiply two large integers. Give example and analyse its time complexity. 10

(b) Write an algorithm for quick sort. Analyse its time complexity for various cases. 10
3. (a) Define string matching problem. Write an algorithm for string matching problem using brute-force technique. 5

(b) Give a brief note on closest pair problem. 5

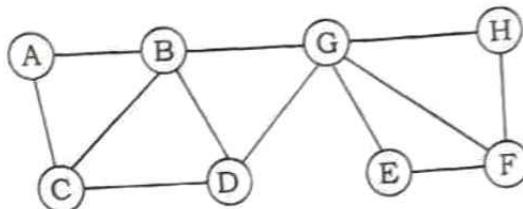
(c) Explain Exhaustive search problem with its merits and demerits and solve the following TSP problem. 10



P.T.O.



4. (a) Construct BFS tree for the following graph.



- (b) Write an algorithm to construct a spanning tree using Depth First Search Method. Give its time complexity. 8
- (c) Sort the given array using insertion sort. 6
- 8, 7, 4, 25, 13, 12, 5, 3.

PART - B

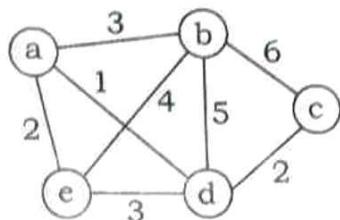
5. (a) Define AVL Tree. Explain with examples various rotations used to balance a AVL tree. 8
- (b) Construct a 2-3 tree for the following list.
- (i) A, L, G, O, R, I, T, H, M
 - (ii) 5, 4, 3, 7, 6, 1, 2, 10, 11, 12
- (c) Write a note on presorting and its applications. 4
6. (a) Write an algorithm for all source, shortest path. Give its time complexity. 6
- (b) Apply Warshals algorithm to check whether the graph is connected or not for the given adjacency matrix. 8

	a	b	c	d	e
a	0	1	0	0	1
b	1	0	1	0	1
c	0	1	0	1	1
d	0	0	1	0	1
e	1	1	0	1	0

- (c) Write a note on optimal binary search tree. 6



- (a) Write an algorithm for single source shortest path problem. Analyse its time complexity. 10
- (b) Construct a minimum spanning tree using prims method for the graph given. 5
- 10

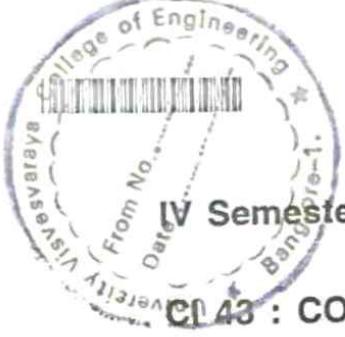


- (c) Construct a state space tree for 4- Queens problem and identify all the possible solutions. 5

Write short notes on any Four of the following :

5x4=20

- (a) Hashing
- (b) Horner's rule
- (c) P, N P, and NP - complete problems
- (d) Subset Sum problem
- (e) Horspool's string matching



BE - 159

IV Semester B.E. (CSE/ISE) Degree Examination, Dec. 2016
(2K11 Scheme)

CL43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

Instructions : Answer **any five** questions selecting atleast **two** from each Part.

PART - A

1. a) Discuss the salient features of a general purpose machine. 4
b) Explain progress in computer hardware through the various generations of computers. 8
c) What are the different classification of computer ? Evaluate $A = (b + c) * (d - e)$ using 1-address and 0-address machine. 8

2. a) Explain briefly load, Add, shift instruction format in informal description of the simple RISC computer. 8
b) Explain the following addressing modes with RTN (write the syntax).
i) Register indirect addressing mode. 4
ii) Relative addressing mode. 8
c) Assume the following state of affair of the byte addressed machine. 8

Address	Value
PC	100
R_0	200
R_1	300
100	200
104	300
108	400
200	500
300	600
500	700

P.T.O.



Find the value of R_0 after execution of each instruction is given below.

Instruction	Addressing mode	Value of R ₀
1) Load R ₀ , 200	Direct	?
2) Load R ₀ , # 200	Immediate	?
3) Load R ₀ , R ₁	Register	?
4) Load R ₀ , 200 [PC]	Relative	?

3. a) Discuss the characteristic features and performance measurement of a machine. 10
b) Discuss philosophy of machine design of RISC and CISC system. 10

4. a) Explain with a neat block diagram the high level view of the 1-BUS SRC design. 10
b) Discuss data path implementation in processor design. 10

PART - B

5. a) Multiply the following using booth multiplication algorithm.
 Multiplier = $(+13)_{10}$
 Multiplicand = $(-9)_{10}$. 8

b) Explain with a neat diagram, the hardware circuit arrangement for binary division (restore/non restore). 8

c) Represent $(45)_{10}$ using single precision IEEE format. 4

6. a) Explain the following :
 i) Semiconductor memory
 ii) Cache memory
 iii) Direct mapping. 10

b) Explain virtual memory and its importance in memory management. 10

7. a) What is memory mapped I/O ? Explain with a neat block diagram, the DMA daisy chain bus arbitration mechanism. 10

b) Discuss briefly on I/O data format and error control in I/O system. 10

8. Write short notes on : $(4 \times 5 = 20)$

i) RTN	ii) Machine exceptions
iii) Magnetic disk drive	iv) Printers.



IV Semester B.E. (CSE/ISE) Degree Examination, December 2016
(2K11 Scheme)
CI 42 - MICROPROCESSORS

Max. Marks : 100

Instruction : Answer any five questions, selecting at least two from each Part.

PART – A

1. a) With a neat block diagram, explain the architecture of 8086 Microprocessor. 10
b) Explain any three significant bits of flag register of 8086 Microprocessor with an example. 6
c) What is Segmented Memory ? What are the advantages of segmented memory ? 4
2. a) Explain the following addressing modes with examples : 10
i) Immediate addressing mode
ii) Register addressing mode
iii) Memory addressing mode
iv) Implied addressing mode
v) I/O port addressing mode
- b) Let DS = 3080, CS = 0000H, SI = 0008H and IP = 00FFH. What is the address of the instruction that is fetched ? What is the address of the data ? 4
- c) Explain the segment registers and their purpose in the operation of the microprocessor. 6
3. a) Explain the shift instructions used in 8086 microprocessor with example. 6
b) Write an assembly language program to find the largest and smallest element in an array. 8
c) Explain the following assembler directives with examples. 6
i) DW
ii) GLOBAL
iii) EQU
iv) OFFSET
v) ASSUME
vi) LENGTH.

P.T.O.



4. a) Explain the string instructions used in 8086 microprocessor. 7
 b) Write an assembly language program to check whether the given string is palindrome or not. 8
 c) What is Macro ? How it is different from procedure ? Explain. 5

PART – B

5. a) Define procedure. What are the different ways of passing parameters ? Explain with example. 7
 b) Explain how memory is organised in 8086 microprocessor. 7
 c) Write an assembly language program to search a key element in an array using linear search method. 6
6. a) With a functional block diagram, explain 8086 based microcomputer operating in maximum mode. 10
 b) Draw and explain the timing diagram for WRITE operation in 8086 microprocessor. 10
7. a) What is data buffering ? Explain the data buffering mechanism in 8086. 7
 b) Explain the architecture of 8255 PPI with a functional block diagram. 7
 c) Given 4K RAM, write an interfacing circuit for 8086 to realize a memory of 16 K starting at the address 9000 H. 6
8. a) What are Interrupts ? What are the different types of Interrupts ? Explain the Interrupt Vector Table (IVT) of 8086. 8
 b) Write a short note on Direct Memory Access (DMA). 5
 c) Explain the 8259 programmable Interrupt controller interfacing with 8086 microprocessor. 7
-



Comester B.E. (CCE/ICE) Degree Examination, December 2010
(2K11 Scheme)
CI 40 : JAVA AND INTERNET PROGRAMMING

Time : 3 Hours

Max. Marks : 100

Instruction : Answer 5 questions selecting at least two from each Part.

PART – A

1. a) What is Java bytecode ? Which Internet programming problems can be solved using bytecode ? Explain. 5
- b) Write a Java program to find out the factorial of a given number using recursion. 5
- c) What is the difference between method overloading and method overriding ? Illustrate with examples. 10
2. a) Write a Java program to illustrate how data members and methods are inherited ? 10
- b) Explain with an example, the concept and conditions associated with the super () method. 10
3. a) What are a various methods that operate on strings ? Explain. 10
- b) What is exception handling ? Write a Java program that simulates a customer of a virtual cafe drinking a cup of coffee. Consider the exceptional conditions that might occur while the customer sips. 10
4. a) Explain the methods used to support interthread communications. 5
- b) What are the uses of threads ? Explain any one method to create and run a thread with an example. 10
- c) Explain the applet life cycle. 5

P.T.O.



PART – B

- | | |
|----------------------------------------------------------------------------------------------------------------------------|----|
| 5. a) Explain the different categories of perl variables with examples. | 5 |
| b) In what three fundamental ways do Perl arrays differ from the arrays of other common high level programming languages ? | 5 |
| c) Write a Perl program to illustrate how a query string is transmitted to the server with the get method. | 10 |
| 6. a) How XHTML differs from HTML ? | 5 |
| b) How to create images, hypertext links and lists in XHTML. | 5 |
| c) Create, test and validate an XHTML document to describe an ordered list of your five favorite movies. | 10 |
| 7. a) Assume an array name list in alphabetical order, write a Java script to insert a new name and order the name list. | 10 |
| b) Describe with an examples, the two ways to embed a Javascript in an XHTML document. | 10 |
| 8. a) Explain the three phases of event processing in the DOM 2 event model. | 10 |
| b) How to handle events in Java scripts ? List out events, event attributes and their tag. | 10 |
-

BE - 161

IV Semester B.E. (CSE/ISE) Degree Examination, December 2016
(2K11 Scheme)
CI45 : FINITE AUTOMATA AND FORMAL LANGUAGES

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five full questions selecting atleast two questions from each Part.

PART - A

1. a) Design a DFA to accept Language

$L = \{W/W \text{ has add number of } 0's \text{ and odd No. of } 1's \text{ over } \Sigma = \{0, 1\}\}$. Draw transition diagram.

4

- b) Convert the following NFA to DFA.

7

δ_{NFA}	0	1
$\rightarrow p$	$\{p, q\}$	p
q	r	r
r	\$	\emptyset
* \$	\$	\$

- c) Differentiate between NFA and DFA.

4

- d) Define :

5

- Grammar
- Input alphabet
- Language
- String
- Automata

2. a) Write 5 different applications of Finite Automata.

3

- b) Design Regular expressions for the following Languages :

i) $L = \{ W \mid |W| \bmod 3 = 0 \text{ over } \Sigma = \{a, b\} \}$.

ii) Every pair of adjacent 0's appears before any pair of adjacent 1's over $\Sigma = \{0, 1\}$.

6

iii) The set of strings 0's or 1's whose 10th symbol from right end is 1.

0.

5

P.T.O.

c) Design an ϵ -NFA to accept the decimal numbers.

d) Convert the following ϵ -NFA to DFA.

	ϵ	a	b
$\rightarrow p$	{r}	{q}	{p, r}
q	ϕ	{p}	ϕ
r	{p, q}	{r, s}	{p}
*s	{p}	{p}	{p}

3. a) Convert the following regular expression to an equivalent finite automata.

- i) $(a + b)^*ab$
- ii) $(0 + 1)^*|(0 + 1)$.

b) Construct the minimum state equivalent DFA using table filling algorithm.

	0	1
$\rightarrow A$	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

c) Obtain regular expressions from the following DFA using state elimination method.



4. a) Grammar

$$S \rightarrow aS/aSbS/\epsilon$$

Is the above grammar ambiguous show in particular that string "aab" has two :

- i) Parse tree
- ii) Left most derivation
- iii) Right most derivations.

6

b) Design Grammar for the following Language :

i) $n_a(w) = nb(w)$

ii) String with no more than 3 a's over $\Sigma = \{a, b\}$

iii) $n_a(w) > nb(w)$

8

iv) $a^n b^{2n} n \geq 1$ over $\Sigma = \{a, b\}$.

6

c) State and prove pumping Lemma for context-free Languages.

PART - B

5. a) Define PDA. Discuss the Language accepted by PDA. Design non-deterministic PDA for the Language $L = \{0^n | n \geq 1\}$. Show moves for string $0^5 1^5$.

10

b) Convert the grammar

$$S \rightarrow OS/A$$

$$A \rightarrow AO/S/\epsilon$$

to a PDA that accepts same language by empty-stack. Show the moves for string '001'.

10

6. a) What are useless symbols ? Eliminate useless symbols from the following grammar ?

6

$$S \rightarrow aA/cB$$

$$A \rightarrow aA/b$$

$$B \rightarrow cB$$

$$D \rightarrow ab/Ec$$

- b) Define CNF. Convert the following grammar CNF.

$$S \rightarrow aSb/Aa$$

$$A \rightarrow aab \cdot$$

- c) Obtain Nullable set and hence eliminate all ϵ -productions from the following grammar : 8

$$S \rightarrow aAa/AB$$

$$A \rightarrow BS/aBa/\epsilon$$

$$B \rightarrow aB/\epsilon.$$

7. a) Define Turing Machine. Discuss multitape turing machine. 6

- b) Design a Turing Machine to accept Language $L = \{0^n 1^n 2^n : n \geq 1\}$. Write a transition diagram and give instantaneous description for the input '012. 8

- c) Design Turing Machine to accept the language $L = \{WW^R | W \in \{a, b\}^*\}$. 6

8. a) Show that recursive languages are closed under Union and Intersections. 6

- b) Show that the following PCP has no solution. 10

	List A	List B
i	w_i	x_i
1	10	101
2	011	11
3	101	011

- c) Prove that if Language E is recursive, then \bar{E} is also recursive. 4
-



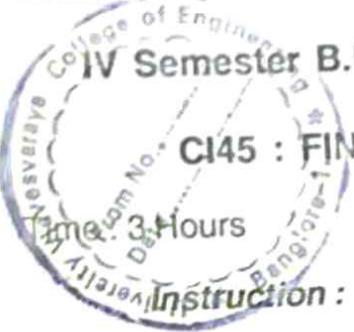
IV Semester DE
[CSE / ISE]

BE - 161

IV Semester B.E. (CSE/ISE) Degree Examination, December 2016
(2K11 Scheme)

CI45 : FINITE AUTOMATA AND FORMAL LANGUAGES

Max. Marks : 100



Instruction : Answer any five full questions selecting atleast two questions from each Part.

PART - A

1. a) Design a DFA to accept Language

$L = \{W/W \text{ has add number of } 0's \text{ and odd No. of } 1's \text{ over } \Sigma = \{0, 1\}\}$. Draw transition diagram.

4

- b) Convert the following NFA to DFA.

7

δ_{NFA}	0	1
$\rightarrow p$	{p, q}	p
q	r	r
r	\$	\emptyset
* \$	\$	\$

4

- c) Differentiate between NFA and DFA.

5

- d) Define :

- i) Grammar
- ii) Input alphabet
- iii) Language
- iv) String
- v) Automata

3

2. a) Write 5 different applications of Finite Automata.

- b) Design Regular expressions for the following Languages :

i) $L = \{ W \mid |W| \bmod 3 = 0 \text{ over } \Sigma = \{a, b\} \}$.

ii) Every pair of adjacent 0's appears before any pair of adjacent 1's over $\Sigma = \{0, 1\}$.

iii) The set of strings 0's of 1's whose 10th symbol from right end is 1.

5

P.T.O.

4

8

c) Design an ϵ – NFA to accept the decimal numbers.

d) Convert the following ϵ – NFA to DFA.

	ϵ	a	b
$\rightarrow p$	{r}	{q}	{p, r}
q	\emptyset	{p}	\emptyset
r	{p, q}	{r, s}	{p}
*s	{p}	{p}	{p}

3. a) Convert the following regular expression to an equivalent finite automata.

6

i) $(a + b)^*ab$

ii) $(0 + 1)^*|(0 + 1)$.

b) Construct the minimum state equivalent DFA using table filling algorithm.

10

	0	1
$\rightarrow A$	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

c) Obtain regular expressions from the following DFA using state elimination method.

4



QUESTION

1. a) Grammar

$$S \rightarrow aS/aSbS/\epsilon$$

Is the above grammar ambiguous show in particular that string "aab" has two:

- i) Parse tree
- ii) Left most derivation
- iii) Right most derivations.

6

b) Design Grammar for the following Language :

- i) $n_a(w) = n_b(w)$
- ii) String with no more than 3 a's over $\Sigma = \{a, b\}$
- iii) $n_a(w) > n_b(w)$
- iv) $a^n b^{2n} n \geq 1$ over $\Sigma = \{a, b\}$.

8

c) State and prove pumping Lemma for context-free Languages.

6

PART - B

5. a) Define PDA. Discuss the Language accepted by PDA. Design non-deterministic PDA for the Language $L = \{0^n 1^n | n \geq 1\}$. Show moves for string $0^5 1^5$.

10

b) Convert the grammar

$$S \rightarrow OS/A$$

$$A \rightarrow A0/S/\epsilon$$

to a PDA that accepts same language by empty-stack. Show the moves for string '001'.

10

6. a) What are useless symbols? Eliminate useless symbols from the following grammar?

6

$$S \rightarrow aA/cB$$

$$A \rightarrow aA/b$$

$$B \rightarrow cB$$

$$D \rightarrow ab/Ec$$



- b) Define CNF. Convert the following grammar CNF.

$$S \rightarrow aSb/Aa$$

$$A \rightarrow aab$$

- c) Obtain Nullable set and hence eliminate all ϵ -productions from the following grammar:

$$S \rightarrow aAa/AB$$

$$A \rightarrow BS/aBa/\epsilon$$

$$B \rightarrow aB/\epsilon$$

7. a) Define Turing Machine. Discuss multitape turing machine.

- b) Design a Turing Machine to accept Language $L = \{0^n 1^n 2^n : n \geq 1\}$. Write a transition diagram and give instantaneous description for the input '012.'

- c) Design Turing Machine to accept the language $L = \{WW^R | W \in \{a, b\}^*\}$.

8. a) Show that recursive languages are closed under Union and Intersections.

- b) Show that the following PCP has no solution.

	List A	List B
i	w _i	x _i
1	10	101
2	011	11
3	101	011

- c) Prove that if Language E is recursive, then \bar{E} is also recursive.

IV Semester B.E. (CSE/ISE) Degree Examination, June/July 2017
 (2K11 Scheme)

CI43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

Instruction : Answer five full question selecting atleast two from each Part.

PART-A

1. a) Define the following terms. 6
 - i) Instruction Set Architecture (ISA) and its components.
 - ii) Fetch-execute cycle.
 - iii) Simulator and emulator.
- b) Explain briefly the salient features of the computer architects view of a computer system. 6
- c) Discuss the computer hardware progress evolved through various generation of a computer system. 8
2. a) With a neat diagram, explain the memory read and memory write operation of a computer. 4
- b) Evaluate the following expression X, using 1 and 0 addressing machine $X = a + (b * c)$. 4
- c) Explain meaning of the following instructions in informal SRC machines.
 - i) ld ra, c2 (rb)
 - ii) shr ra, rb, rc
 - iii) brl ra, rb, rc, c3
 - iv) neg ra, rc. 4

- d) From the following snapshot of addressing modes of a machine, compute the contents of register R_0 , after execution of each instruction. 8

Machine State

Address	Value
PC	100
R_0	200
R_1	300
100	200
200	500
300	600
500	700

Instruction	Contents of R_0
1. Load R_1 , # 200	?
2. Load R_1 , 200	?
3. Load R_1 , (200)	?
4. Load R_1 , [R_1]	?
5. Load R_1 , 200[PC]	?

3. a) Differentiate between CISC and RISC machines. Discuss important strategies considered during the design of RISC system. 10
- b) Describe with a neat figure, working principle of a register window mechanism of a SPARC machine. 10
4. a) Explain briefly the data path implementation in a computer system. 10
- b) Describe concrete RTN of the SRC reset operation in 1 – bus SRC. 10

PART – B

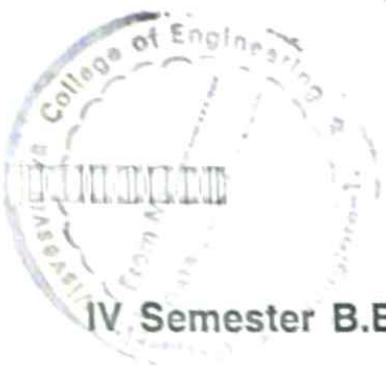
5. a) What are the disadvantages of a ripple carry adder ? Discuss how this problem is addressed by carry-look-ahead-adder. 8
- b) Perform the following computation.
- i) Represent the decimal No. +45 in single precision and double precision IEEE floating point notation. 4
 - ii) Perform multiplication of MPR = (-9) and MCND = (10) using Bit-pair Recoding Method. 4
 - iii) Perform the addition of $22_{(10)}$ and $42_{(10)}$ in floating point numbers. 4

C. QUESTIONS

2

11-12

- Q. a) Write a C program which prints the following:
b) Change the memory hierarchy of the program. Check the efficiency of the new arrangement.
- Q. What is virtual memory? Discuss its advantages over the logical memory.
- Q. a) Differentiate between memory management and memory allocation.
b) Explain briefly the various methods of handling memory in multiprogramming environment. Is it simple?
- Q. What is DMA? Explain with a C program, the transfer of data from one device to another using bus structure arrangement.
- Q. Write short notes on:
i) Benchmark programs
ii) Classification of computers
iii) Buses
iv) Input Devices
-



[CSE/ISE]

UJ - 158

IV Semester B.E. (CSE/ISE) Degree Examination, June/July 2017
(2K11 Scheme)
CI 42 : MICROPROCESSORS

Time : 3 Hours

Max. Marks : 100

Instruction: Answer any five questions, selecting atleast two from each Part.

PART – A

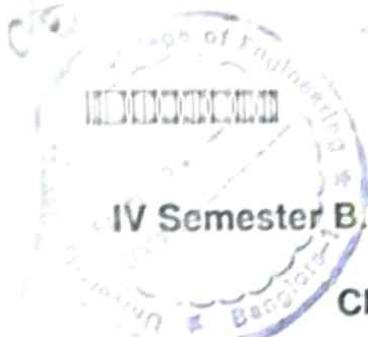
1. a) What is a Microprocessor ? Explain the register set of 8086 Microprocessor. 10
b) Explain the architecture of 8086 Microprocessor with a neat block diagram. 10
2. a) Explain the various addressing modes of 8086 with examples. 12
b) Explain any four significant bits of flag register of 8086 Microprocessor with an example. 8
3. a) Explain the following instructions with examples (5×2=10)
 - i) MOV
 - ii) CMP
 - iii) LOOP
 - iv) XCHG
 - v) AAA
b) Explain the Rotate instructions used in 8086 microprocessor with examples. 5
c) Write an assembly language program to find the factorial of a number. 5
4. a) What are Assembler directives ? List and explain the assembler directives used in the 8086 Microprocessor. 8
b) What is a procedure ? What are the different ways of passing parameters ? Explain with example. 8
c) What are the differences between a macro and a procedure ? 4

P.T.O



PART - B

5. a) What is modular programming ? Explain with suitable examples how it can be achieved ? 5
- b) Write an ALP to sort a given set of numbers in ascending order using Bubble sort algorithm. 8
- c) Explain the Physical Memory organization of 8086 Microprocessor. 7
6. a) With a functional block diagram, explain 8086 based microcomputer operating in minimum mode. 10
- b) Draw and explain the timing diagram for READ operation in 8086 Microprocessor. 10
7. a) What is address latching ? Explain how address latching takes place in 8086 ? 6
- b) Explain the architecture of 8255 PPI with a functional block diagram. 7
- c) Given $1\text{ K} \times 8$ RAM chip, design an interfacing circuit for 8086 microprocessor to realize a memory map of $1\text{ K} \times 16$ (16-bit) memory. The given address is 80000H. 7
8. Write short note on : (5x4=20)
- Control word Register of 8255 PPI.
 - Interrupt Vector Table.
 - 7-segment display device.
 - Logic controller interfacing with 8086.



IV Semester, B.E
[CSE / ISE]

CSE

JE - 250

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)

CI 46 : JAVA AND INTERNET PROGRAMMING

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five questions choosing at least two from each Part.

PART – A

1. a) Illustrate Java constructors with an example code. 5
b) Write a program and define a class called 'Box' with members as length, breadth and height. Initialize the parameters and write a method to compute the volume. 8
c) Discuss the following :
 - i) Abstract class
 - ii) Interface. 7
2. a) Demonstrate method overriding in Java with an example program. 10
b) What are the methods used for Input/Output operation in Java ? 5
c) How is polymorphism achieved in Java ? 5
3. a) Define strings. Discuss any five string handling functions in Java. 10
b) Discuss exceptions in Java. Write a program to illustrate try, catch and finally in Java. 10
4. a) Write a Java program to change thread priorities. 5
b) Explain producer-consumer problem. 5
c) What are applets ? 5

PART – B

5. a) Explain scalar operations in Perl. 5
b) Explain the following in perl with example program.
i) Arrays
ii) Hashes
iii) Functions. 9
- c) What is a query string ? How is a query string transmitted to the server with the post method ? 6

P.T.O.

33 UNIT 11
[321|323]



W

6. a) Discuss the five most commonly used HTTP methods and their purposes. 5
- b) Illustrate with an example the standard XHTML document structure. 9
- c) Give the syntax and example for the following tags.
- i) <pre>
 - ii) <a>
 - iii) <sub>.
- 6
7. a) Write an XHTML document and java script function to compute and print Fibonacci series. 10
- b) Explain primitive data types, input and output operations of java scripts. 10
8. a) Write an XHTML document which displays a form containing text elements to input employee name, emp-id, no-of-days-working, salary. Develop a java script to compute the salary to be paid on button click and display. 10
- b) Explain the three phases of event processing in the DOM2 event model. 10

**IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)**

CI 46 : JAVA AND INTERNET PROGRAMMING

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IV Semester . B.E.
CSE/ISE

JE - 250

Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)

CI46 : JAVA AND INTERNET PROGRAMMING

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Max. Marks : 100

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IV Semester
CSE (ISE)

JE - 248

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)

CJ44 : DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 Hours

Max. Marks : 100

Instruction : Answer five complete questions selecting atleast two from each Part.

PART – A

1. a) Define algorithm. Explain with a flowchart, the process of algorithm design and analysis. 10
- b) With an algorithm derive the time complexity of converting decimal to binary. 5
- c) Define Big O notation. Express the $F(n) = 10n^3 + 5$ using Big O notation. 5
2. a) What is exhaustive search ? Obtain the optimal solution for the given Knapsack problem $M = 5$, weight [] = [2, 1, 3, 2] and profit [] = [20, 5, 25, 15]. 10
- b) Explain Closest-pair problem with an algorithm. Derive its Time complexity. 10
3. a) Write an algorithm to sort an array using Quick sort. Derive its complexity. 10
- b) Explain how divide and conquer technique can be applied to multiply two large integers. Find its time complexity. 10
4. a) Write a program for Breadth First Search. Give its time complexity. 10
- b) Explain how the following techniques can be used in topological sort. 10
- i) Source removal method
- ii) DFS method.

PART – B

5. a) Define AVL tree. With example, explain various rotations used to balance an AVL tree. 10
- b) Construct 2-3 Tree for the input A, L, G, O, R, I, T, H, M. 5
- c) Search pattern BAOBA in a text BESS-KNEW-ABOUT-BAOBABS using Horspool String Matching Technique. 5

P.T.O.



6. a) Apply Warshal's algorithm to check whether the graph is connected or not for the given adjacency matrix. Write the algorithm and find its time complexity. 10

	a	b	c	d
a	0	1	1	0
b	1	0	0	0
c	1	0	0	1
d	0	0	1	0

- b) Obtain an optimal solution for the following Knapsack problem.

Given $M = 5$

Weight [] = [2, 1, 3, 2] and Profit [] = [10, 12, 20, 15]

10

7. a) Write an algorithm to obtain a MST using Kruskal's method. Give its time complexity. 10

- b) Construct an Huffman tree for the following data and encode

aabbcdacd@abcd@aa

10

Character	a	b	c	d	@
-----------	---	---	---	---	---

Probability	0.3	0.2	0.25	0.15	0.1
-------------	-----	-----	------	------	-----

8. Write short notes on :

$(5 \times 4 = 20)$

- a) N Queens problem
- b) NP complete and NP Hard problem
- c) B trees
- d) Presorting.

IV Semester B.E
[CSE / ISE]

JE - 248



Time: 3 Hours

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)

CI44 : DESIGN AND ANALYSIS OF ALGORITHMS

Max. Marks : 100

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- | | | | | |
|----------|----------|----------|----------|---|
| a | b | c | d | |
| a | 0 | 1 | 1 | 0 |
| b | 1 | 0 | 0 | 0 |
| c | 1 | 0 | 0 | 1 |
| d | 0 | 0 | 1 | 0 |
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aabbcdaacd@abcd@aa 10
- | | | | | | |
|--------------------|-----|-----|------|------|-----|
| Character | a | b | c | d | @ |
| Probability | 0.3 | 0.2 | 0.25 | 0.15 | 0.1 |
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- N Queens problem
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 - B trees
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IV Semester B.E.
(CSE/ISE)

JE - 248

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)
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IV Semester B.E. (CSE/ISE) Degree Examination, Jan./Feb. 2021
(2K11 Scheme)

CI 43 : COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five full questions, choosing at least two from each Part.

PART – A

1. a) Briefly explain the Computer Architect's view of a computer system. 8
- b) What is a stored program concept ? Explain. 6
- c) List out the advantages of assembly language programming. 6
2. a) Explain the following instruction format in Informal SRC Machine with example : (5x2=10)
 - i) Load and store instruction
 - ii) Rotate instruction.
- b) Explain multiplexed register transfer using gates and strobes. 10
3. a) Explain the various addressing modes of MC 68000. (5x2=10)
- b) Explain the following :
 - i) Pipelining technique in RISC Machine
 - ii) Interrupts and traps in SPARC.
4. a) Explain 1-Bus microarchitecture for SRC with neat diagram. 10
- b) Briefly explain the data path implementation in a computer system. 10

PART – B

5. a) Explain the logic of a carry look ahead adder and hence design a 16 bit carry look ahead adder using 4-bit adders. 10
- b) Explain Booth's algorithm, multiply + 15 and - 6 using Booth's multiplication. 10

P.T.O.

6. a) What is Virtual Memory ? With a diagram, explain how Virtual Memory address is translated. 10
- b) Write a short note on : (5×2=10)
- i) Read Only Memories
 - ii) Cache Memories.
7. a) Describe with a neat diagram, how DMA is used to transfer data from peripherals. 10
- b) What is an Interrupt ? Discuss different types of interrupts. 10
8. Write a short notes on : (5×4=20)
- i) Display devices
 - ii) Magnetic disk drives
 - iii) Interface circuits
 - iv) Printers.
-



IV

Semester -B.E
[CSE/ISE]

JE - 247

IV Semester B.E. (CSE/ISE) Degree Examination, Jan./Feb. 2021
(2K11 Scheme)

CI 43 : COMPUTER ORGANIZATION AND ARCHITECTURE

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IV Semester B.E.
[CSE / ISE]

JE - 247

IV Semester B.E. (CSE/ISE) Degree Examination, Jan./Feb. 2021
(2K11 Scheme)

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 - ii) Cache Memories.
7. a) Describe with a neat diagram, how DMA is used to transfer data from peripherals. 10
- b) What is an Interrupt ? Discuss different types of interrupts. 10
8. Write a short notes on : $(5 \times 4 = 20)$
- i) Display devices
 - ii) Magnetic disk drives
 - iii) Interface circuits
 - iv) Printers.
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IV Semester . BE
[CSE / ISE]

JE - 246

IV Semester B.E. (CSE/ISE) Degree Examination, January/February 2021
(2K11 Scheme)
CI42 : MICROPROCESSORS

Time : 3 Hours

Max. Marks : 100

Instruction : Answer any five full questions, selecting atleast two from each Part.

PART – A

1. a) Define a processor. Explain the different register set of 8086 microprocessor. 10
b) Write a note on pipelining. 5
c) Mention the differences between real mode and protected mode memory system. 5
2. a) Explain the segmented memory and mention its advantages. 8
b) Explain the following addressing modes with examples. 6
i) Scaled-indexed addressing mode
ii) Relative addressing mode
c) Discuss the importance of protected mode memory addressing. 6
3. a) Explain the branching instructions used in 8086 microprocessor with examples. 10
b) Write a program for 8086 microprocessor to sort N elements stored in an array using bubble sort. 10
4. a) Explain the various assembler directives used in 8086 microprocessor with examples. 10
b) Write a program for 8086 microprocessor to search a key element in an 16 bit array using binary search. 10

PART – B

5. a) Differentiate between macros and procedures. 6
b) Write a mixed language program that converts binary to ASCII. 7
c) What is modular programming ? Explain with suitable example. 7
- P.T.O.



6. a) Explain the functions of following pins in 8086. 5
- i) MN/M \bar{X}
 - ii) ALE
 - iii) INTR
 - iv) RESET
 - v) READY
- b) Bring out the differences between 8086 and 8088 microprocessors. 5
- c) Explain the timing diagram for WRITE operation in 8086 microprocessor. 10
7. a) Interface 8K X 8 ROM and 4K X 8 RAM to 8086 processors. Assume that the starting address for ROM is 40000 and that for RAM is 44000. 10
- b) Compare memory mapped I/O and I/O mapped I/O interfacing techniques. 5
- c) What is address latching ? Explain how address latching takes place in 8086. 5
8. a) Explain with a neat block diagram the working operation of 8255 PPI. 10
- b) Explain the control word register of 8254 programmable interval timer. 5
- c) Explain 8259 programmable interrupt controller. 5
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