

16. University question papers of previous years

Course Code: 18CS2202

AR18

**Geethanjali College of Engineering and Technology (Autonomous), Hyderabad
II B.Tech (CSE) II Semester (Regular) End Examinations, Nov 2020**

COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING

Time: 2 hours

Max. Marks: 70M

Answer All Questions

5 X 14M =70M

- 1** Analyze the different formats of instructions with examples.

OR

- 2** Demonstrate different types of addressing modes with a numerical example.

- 3** How the handshake method is used for solving the problem of strobe method? Explain.

OR

- 4** Describe the modes of data transfer to and from peripherals.

- 5** Assess the three types of mapping procedures considering the organization of cache memory

OR

- 6** Explain the mechanism of memory address map and memory connection to CPU.

- 7** Draw the pin configuration of 8086 microprocessor and describe all the signals in detail.

OR

- 8** Describe the register organisation in 8086 microprocessor in detail.

- 9** Explain the general instruction format of the 8086 microprocessor.

OR

- 10** Write an assembly language program in 8086 microprocessor to evaluate the following expression: $A = B + C * D * E + F$.

Course Code: 16CS2202

AR16

Geethanjali College of Engineering and Technology (Autonomous), Hyderabad

Geethanjali College of Engineering and Technology (Autonomous), H.P.Tech (CSE) II Semester (Regular/Supply) End Examinations, Apr/May 2019

I.B.Tech (CSE) II Semester (Regular/Supplementary) End Examination, April/May-2019
Computer Organization and Assembly Language Programming

Max. Marks: 70

Time: 3 hours

Answer All Questions
PART-A

$$10 \times 2M = 20M$$

- | | | |
|----|--|----------------------|
| | PART-A | |
| 1 | a. Define the fields found in instruction format.
b. What is the purpose of program control instructions.
c. What is the necessity of I/O interface?
d. Distinguish Isolated and Memory-Mapped I/O
e. Write memory hierarchy in a computer system.
f. Define Cache Mapping process and list types of mapping procedures.
g. List the 8086 pins.
h. Classify the 8086 segment registers.
i. List Branch Instructions of 8086.
j. Develop 8086 program to perform multiplication of any two 16-bit numbers. | |
| | PART-B | 5 X 10M = 50M |
| 2 | a. Explain any five addressing modes with numerical examples.
b. Explain the functions of various components of computer with a neat diagram. | 5M
5M |
| | OR | |
| 3 | a. Explain Subroutine call and return with their micro operations.
b. Write three, two, one, zero address instruction formats for the expression
$x = ((a + b) * (c + d)) / (e + f)$. | 5M
5M |
| 4 | a. What are the Initial and Final operations of each Interrupt Service Routine?
b. Summarize CPU-IOP Communication. | 5M
5M |
| | OR | |
| 5 | a. Explain DMA transfer.
b. Illustrate the asynchronous data transfer using strobe control and hand shaking methods. | 5M
5M |
| 6 | a. Explain Memory Connection to CPU.
b. Explain Associative memory with hardware organization. | 5M
5M |
| | OR | |
| 7 | a. Demonstrate Cache memory with Associative mapping.
b. Illustrate Address mapping using pages in virtual memory. | 5M
5M |
| 8 | a. Explain the general purpose and segment registers of 8086.
b. Summarize the pipelining concept of 8086. | 5M
5M |
| | OR | |
| 9 | a. Design and explain the 8086 pin diagram.
b. Demonstrate addressing modes of 8086 with examples. | 5M
5M |
| 10 | a. Develop 8086 program to find sum of given set of numbers.
b. Illustrate 8086 Call instructions with examples. | 5M
5M |
| | OR | |
| 11 | a. Develop 8086 program to sort a set of numbers in descending order.
b. Explain different arithmetic instructions with suitable examples. | 5M
5M |

AR16

Course Code: 16CS2202

Geethanjali College of Engineering and Technology (Autonomous), Hyderabad

II B.Tech. (CSE) II Semester (Regular) End Examinations, Apr 2018

COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING

Time: 3 hours

Max. Marks: 70

**Answer All Questions
PART-A**

10X2M=20M

1. a. Mention functions of I/O units.
b. List out types of Interrupts.
c. Discuss steps involved in strobe control.
d. Mention responsibilities of I/O interfaces.
e. With a diagram, show memory hierarchy.
f. Write basic principle of RAM memory devices.
g. State special functions of general purpose registers.
h. Give an example of register direct address mode of 8086.
i. How a branch statement functions based on sign flag?
j. Write an example for CALL statement.

PART-B

2. a. Differentiate instruction format based on address sizes. 5M
b. Status bit conditions are important in program control. Justify it. 5M
OR
3. a. Explain any Five addressing modes with numerical examples. 5M
b. Discuss various functions of memory units. 5M
4. a. Which of the three I/O techniques is most suitable for designing single user system? 5M
b. Explain how Interrupt initiated I/O handles the data transfers. 5M
OR
5. a. Compare functionality of Isolated Vs Memory mapped I/O techniques. 5M
b. Narrate how DMA controller performs data transfer operation. 5M
6. a. How many 128×8 RAM chips are needed to provide a memory capacity of 2048 bytes? 2M
b. How many lines of the address bus must be used to access 2048 bytes of memory? How many of these lines will be common to all chips? 2M
c. How many lines must be decoded for chip select? Specify the size of the decoders. 2M
d. Describe how associate mapping is used in handling Cache memory. 4M
OR
7. a. Explain the process of designing the Memory address map with the help of given address bus. 5M
b. Explain the concept of virtual memory. 5M

- | | | |
|----|---|----|
| 8 | a. Explain how segment registers of 8086 microprocessor help in calculating the address of next instruction or data byte. | 5M |
| | b. Write an Assembly Language Program to take “n” values from user and sort them in ascending order for 8086. | 5M |
| OR | | |
| 9 | a. Enumerate the concept of Pipelining with the help of a suitable example | 5M |
| | b. Mention usage of Flag register in iterative instructions | 5M |
| 10 | a. Demonstrate the usage of branching instructions with suitable examples | 8M |
| | b. How to specify RET instruction in a procedure? | 2M |
| OR | | |
| 11 | a. Write an 8086 ALP to add the (four) values stored in data segment starting from 3200H location into AX register. | 5M |
| | b. Explain the execution of CALL and RET instructions with the help of an example. | 5M |

26 26 26 26 26 26 26 26 2
R13

Code No: 114CN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2017

COMPUTER ORGANIZATION

(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) Define the effective address. [2]
- b) Explain about Logical and Bit Manipulation Instructions. [3]
- c) Explain about the purpose of Input-output interface. [2]
- d) Explain about the two-wire control. [3]
- e) Explain about auxiliary memory. [2]
- f) What is a bootstrap loader? Explain about the functions of bootstrap loader. [3]
- g) Explain about the purpose of Bus High Enable pin in 8086. [2]
- h) Explain about condition code flag register in 8086. [3]
- i) Explain about One-byte instruction in 8086. [2]
- j) Explain about FAR PTR and NEAR PTR assembler directive. [3]

PART-B

(50 Marks)

26. Write a program to evaluate the arithmetic statement:

$$\underline{X-A-B+C*(D-E-F)} \\ G+H*K$$

a) Using a general register computer with three address instructions.

b) Using a general register computer with two address instructions. [5+5]

OR

- 3.a) Explain about the functions of CPU.
- b) Explain about Program Control Instructions. [5+5]
- 4.a) Explain about Source-initiated transfer using handshaking and Destination-initiated transfer using handshaking with a neat diagram.
- b) A CPU with a 20-MHz clock is connected to a memory unit whose access time is 40 ns. Formulate a read and write timing diagrams using a READ strobe and a WRITE strobe. Include the address in the timing diagram. [5+5]

OR

5.a) What is the difference between isolated I/O and memory-mapped I/O? What are the advantages and disadvantages of each?

b) Explain about Intel 8089 IOP. [5+5]

- 26 26 26 26 26 26 26 26 2
6. A computer uses RAM chips of 1024×1 capacity.

a) How many chips are needed, and how should their address lines be connected to provide a memory capacity of 1024 bytes?

b) How many chips are needed to provide a memory capacity of 16K bytes? Explain in words how the chips are to be connected to the address bus. [5+5]

- 26 26 26 26 26 26 26 26 2
- 7.a) Obtain the Boolean function for the match logic of one word in an associative memory taking into consideration a tag bit that indicates whether the word is active or inactive.

b) Explain about Virtual Memory with the implementation details. [5+5]

- 26 26 26 26 26 26 26 26 2
- 8.a) Explain about the register organization of 8086.
- b) Explain about the concept of segmented memory with a neat diagram. Explain its advantages. [5+5]

OR

- 9.a) Explain about addressing modes of 8086.
- b) Explain about the functions of opcode prefetch queue in an 8086 system. [5+5]

- 10.a) Explain about different instruction formats in 8086.
- b) Write an Assembly Language program to perform one byte BCD addition. [5+5]

OR

- 11.a) Explain about different types of Assembler directives and operators.
- b) Write an ALP program to find transpose of a 3×3 matrix. [5+5]

---ooOoo---

R Code No: 114CN1

R1

R1

R1

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016

COMPUTER ORGANIZATION

(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 75

R1

R1

R1

R1

R1

R1

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

R1

R1

R1

R1

R1

R1

PART - A

(25 Marks)

- 1.a) What is the role of PC, IR registers? [2]
- b) How many references to memory are needed for direct address instruction to bring an open and into a processor register? [3]
- c) What are the advantages of DMA? [2]
- d) Explain dairy-chain priority interrupt. [3]
- e) What is hit ratio? [2]
- f) What is the transfer rate of an eight-track magnetic tape whose speed is 120 inches per second and whose density is 1600 bits per inch? [3]
- g) What is the function of 8086 index registers? [2]
- h) What is non-maskable interrupt? [3]
- i) What is the use of 'CMPS' 8086 instruction? [2]
- j) Explain 'ROR' and 'ROL' 8086 instructions. [3]

PART - B

(50 Marks)

R1

R1

R1

R1

R1

R1

Explain various instruction formats.

OR

3. Explain various addressing modes with examples. [10]

4. Draw and explain the block diagram of DMA controller. [10]

OR

R1

R1

R1

R1

R1

R1

5. Explain source-initiated and destination initiated data transfer using handshaking. [10]

R1

R1

R1

R1

R1

R1

6. The access time of a cache memory is 100 ns and that of main memory 1000 ns. It is estimated that 80% of the memory requests for 'read' and remaining 20% for 'write'. The hit ratio for read accesses only is 0.9. A write-through procedure is used.

a) What is the average access time of the system considering only memory read cycles?

b) What is average access time of the system considering only memory read cycles?

c) What is the hit ratio taking into consideration the write cycles? [4+3+3]

R1

R1

R1

OR

R1

R1

R1

- 7.a) Explain the set-associative mapping of cache memory. [5] [5]
- b) Write short notes on virtual memory. [5+5]
8. Explain the fields in 8086 flag register. [10]
- OR
9. Explain the pin diagram of 8086 with figure. [10]
10. Write 8086 assembly language program to convert a 16-bit binary number into Equivalent BCD number. [10]
- OR
11. Write a 8086 assembly language program to find two 16-bit operands. [10]
- ooOoo---

16. University question papers

R1

R1

R1

R1

R1

R1

R1

R15

Code No: 124CB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2017

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

R1

Time: 3 Hours

R1

R1

R1

R1

R1

R1

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

R1

R1

R1

PART-A

R1

R1

R1

F

- 1.a) Define order of growth. [2]
- b) If $f(n) = 5n^2 + 6n + 4$ then prove that $f(n) \in O(n^2)$. [3]
- c) Define a spanning tree and minimum spanning tree. [2]
- d) Define articulation point. [3]
- e) Define greedy method. [2]
- f) State the principle of optimality. [3]
- g) List the application of Backtracking. [2]
- h) Define E-node. [3]
- i) Define class P. [2]
- j) Explain briefly about optimization problem. [3]

R1

PART-B

(50 Marks)

- 2.a) Write the pseudo code that input of n integers and output them in non decreasing order. [5]
- b) Describe the Master's theorem. Solve the following recurrence relations by using Master's theorem.
 - i) $T(n) = 4T(n/2) + n$
 - ii) $T(n) = 2T(n/2) + n\log n$

OR

R1

3.a) Define recurrence equation? Find the time complexity of merge sort from recurrence relation using substitution method. [5]

- b) Write the pseudo code for binary search and analyze the time complexity. [5]

R1

4.a) Compare and contrast BFS and DFS. [5]

- b) Define strongly connected components. Explain the properties of strongly connected components. [5]

OR

- 5.a) Discuss about various binary tree traversal methods with example. [5]
- b) Differentiate greedy and dynamic programming. [5]
- 6.a) Discuss about fractional knapsack problem. Consider the following instance of knapsack problem $n=3$, $m=20$, profits $(p_1, p_2, p_3)=(25, 24, 15)$ and weights $(w_1, w_2, w_3)=(18, 15, 10)$. Obtain the optimal solution using greedy approach. [5]
- b) Compute all pair shortest path for following graph shown in figure 1. [5]

R1

R1

R1

R1

R1

R1

R1

F

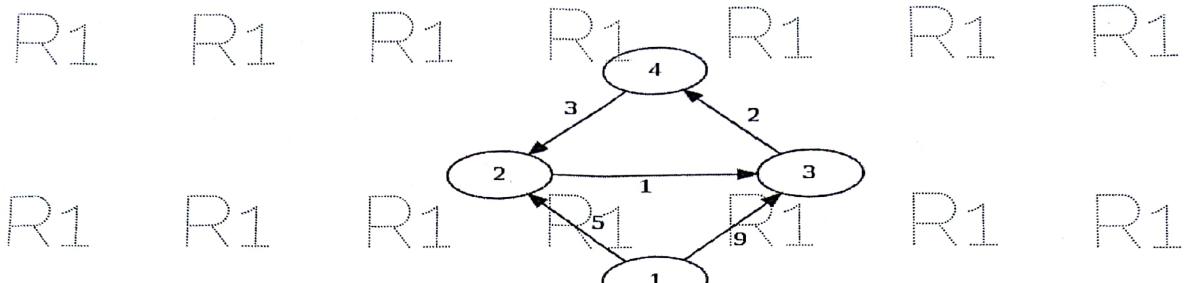


Figure: 1
OR

- 7.a) Write the pseudo code for dijkshra's algorithm for single source shortest path problem.
 b) Describe travelling sales person problem. Find the minimum cost tour for the following graph using dynamic programming. Costs of the edges are given by matrix shown in figure 2. [5+5]

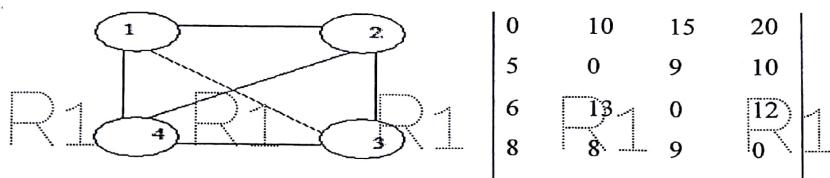


Figure: 2

8. What is graph coloring problem? Describe the back tracking technique to m-coloring with following planar graph shown in figure 3. [10]

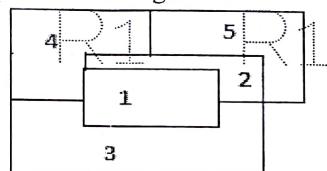


Figure: 3

9. Write about Hamiltonian cycle. Draw portion state space tree for the following graph shown in figure 4. [10]

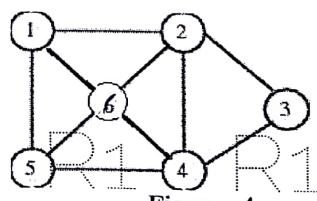


Figure: 4

- 10.a) Write short notes on 3-SAT problem.
 b) Briefly explain deterministic and non deterministic algorithms with example. [5+5]

OR

- 11.a) Describe about clique problem.
 b) Give the relation between NP Hard and NP Complete. [5+5]

Note: This question paper contains two parts A and B.
 Part A is compulsory which carries 25 marks. Answer all questions in Part A.
 Part B consists of 5 Units. Answer any one full question from each unit.
 Each question carries 10 marks and may have a, b, c as sub questions.

- | 1.a) | PART-A | (25 Marks) |
|------|--|------------|
| b) | List the asymptotic notations. | [2] |
| c) | Explain the time complexity of merge sort. | [3] |
| d) | Define graph. | [2] |
| e) | Explain the properties of strongly connected components. | [3] |
| f) | Give brief description on greedy method. | [2] |
| g) | What is multistage graph? | [3] |
| h) | Write the applications of Branch and Bound problem. | [2] |
| i) | What is sum of subsets problem? | [3] |
| j) | What is NP-Hard? | [2] |
| | Explain non-deterministic algorithm. | [3] |

PART-B (50 Marks)

- | | | |
|------|---|-------|
| 2.a) | What is an algorithm? Explain its characteristics. | [5+5] |
| b) | Explain the strassen's matrix multiplication. | [5+5] |
| OR | | |
| 3.a) | Discuss about space complexity in detail. | [5+5] |
| b) | Write an algorithm for quick sort. Explain with an example. | [5+5] |
| 4.a) | Describe Union and Find algorithms. | [5+5] |
| b) | Explain the BFS algorithm with example. | [5+5] |
| OR | | |
| 5.a) | Write a nonrecursive algorithm for preorder traversal of a binary tree T. | [5+5] |
| b) | Explain game tree with an example. | [5+5] |
| 6.a) | Write a greedy algorithm for the job sequencing with deadlines. | [5+5] |
| b) | Define merging and purging rules in 0/1 knapsack problem. | [5+5] |
| OR | | |
| 7.a) | Differentiate between greedy method and dynamic programming. | [5+5] |
| b) | Explain the Kruskal's algorithm with an example. | [5+5] |
| 8.a) | Draw the portion of the state space tree generated by LCBB for the following instances:
$n=5, m=12, (P_1 \dots P_5) = (10, 15, 6, 8, 4) \quad (w_1 \dots w_5) = (4, 6, 3, 4, 2)$ | [10] |
| OR | | |
| 9.a) | Describe Backtracking technique to m-coloring graph. | [5+5] |
| b) | Briefly explain n-queen problem using backtracking. | [5+5] |

- | | | |
|-------|--|-------|
| 10.a) | Explain the classes of NP-Hard and NP-Complete. | [5+5] |
| b) | Explain the satisfiability problem. | [5+5] |
| OR | | |
| 11.a) | Explain the strategy to prove that a problem is NP hard. | [5+5] |
| b) | Explain the non-deterministic sorting problem. | [5+5] |

---0000---

ZH ZH ZH ZH ZH ZH

R13

Code No: 114CS

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2015

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

- | | | |
|------|---|-------------------|
| 1.a) | Explain amortized complexity | (25 Marks) |
| b) | Show that if $f(n) = a_m n^m + \dots + a_1 n + a_0$ then $f(n) = O(n^m)$. | [2M] |
| c) | What is AND/OR graph? | [3M] |
| d) | Take a graph of 5 nodes and traverse it in preorder, inorder, and postorder. | [2M] |
| e) | What is traveling sales person problem? | [3M] |
| f) | Can we solve 0/1 knapsack problem with greedy method? Comment on your answer. | [2M] |
| g) | What is Hamiltonian cycle? | [3M] |
| h) | What do you mean by bounding? | [2M] |
| i) | What is meant by non-deterministic algorithm? | [3M] |
| j) | What is NP-hard problem? | [2M] |

PART-B

(50 Marks)

- 2.a) Write and explain the control abstraction for Divide and conquer.
b) Explain the theta notation used in algorithm analysis. [6+4]

OR

- 3.a) Sort the records with the following index values in the ascending order using quick sort algorithm. 2, 3, 8, 5, 4, 7, 6, 9, 1
b) What is probabilistic analysis? Give example. [6+4]

- 4.a) What is weighting rule for Union(i,j)? How it improves the performance of union operation?
b) What is biconnected graph? [6+4]

OR

- 5.a) Explain the Find algorithm with collapsing rule
b) What is spanning tree? [6+4]

- 6.a) What do you mean by forward and backward approach of problem solving in Dynamic Programming?
b) What is greedy strategy? [6+4]

OR

- 7.a) Discuss about all pairs shortest path problem with suitable example.
b) Discuss briefly about the minimum cost spanning tree. [6+4]

8. Draw the portion of the state space tree generated by LCBB for the knapsack instances: $n=5$, $(P_1, P_2, \dots, P_5) = (12, 10, 5, 9, 3)$, $(w_1, w_2, \dots, w_5) = (3, 5, 2, 5, 3)$ and $M = 12$. [10]

OR

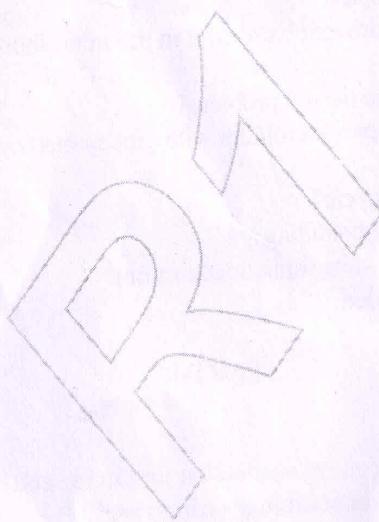
9. What is sum-of-subsets problem? Write a recursive backtracking algorithm for sum of subsets problem. [10]

- 10.a) Discuss about cook's theorem.
b) What is satisfiability problem? [6+4]

OR

- 11.a) Explain the classes of P and NP.
b) Differentiate between NP-complete and NP-Hard. [6+4]

--ooOoo--



11-11-13

Code No: 09A40505

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD**B.Tech II Year II Semester Examinations, June-2014****DESIGN AND ANALYSIS OF ALGORITHMS**

(Common to CSE, IT)

Time: 3 hours**Max. Marks: 75****Answer any five questions****All questions carry equal marks**

- 1.a) Explain the asymptotic notations used in algorithm analysis.
b) What is big "oh" notation? Show that if $f(n) = a_m n^m + \dots + a_1 n + a_0$ then $f(n) = O(n^m)$.
- 2.a) What is weighting rule for Union(i, j)? How it improves the performance of union operation? Explain with example.
b) What is biconnected graph? How to determine biconnected components of graph?
- 3.a) Apply divide and conquer strategy to the following input values for searching 112 and -14 by showing the values of low, mid, high for each search.
-15, -6, 0, 7, 9, 23, 54, 82, 101, 112, 125, 131, 142, 151
b) Why Strassen's matrix multiplication method is efficient? Explain with suitable example.
- 4.a) What is job sequencing with deadlines problem? Let $n = 5$,
 $(p_1, p_2, \dots, p_5) = (10, 3, 33, 11, 40)$ and $(d_1, d_2, \dots, d_5) = (3, 1, 1, 2, 2)$. Find the optimal solution using greedy algorithm.
b) Write and explain the control abstraction for Divide and conquer.
- 5.a) How reliability design problem can be solved with dynamic programming? Give example.
b) Discuss about all pairs shortest path problem with suitable example.
- 6.a) What is Hamiltonian cycle? Discuss a backtracking algorithm that finds all the Hamiltonian cycles in a graph.
b) Write a recursive backtracking algorithm for sum of subsets problem.
- 7.a) Illustrate LCBB solution to solve the knapsack problem.
b) What do you mean by bounding? Explain how these bound are useful in branch and bound methods?
- 8.a) Explain the classes of NP-Hard and NP-Complete.
b) Discuss about deterministic and non-deterministic algorithms.

R09

Code No: R09220505

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech II Year II Semester Examinations, May-2013

Design and Analysis of Algorithms

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. Define time complexity, Describe different asymptotic notations used to represent the time complexities with suitable examples. [15]
2. Develop algorithms for UNION and FIND using weighing rule and collapsing rule respectively. [15]
- 3.a) Write and explain the control abstraction for Divide and conquer and give the time complexity.
b) Discuss Strassen's matrix multiplication and derive the time complexity. [15]
- 4.a) What is the solution generated by the function Job sequencing when N=7, (P₁, P₂, ... , P₇) = (3, 5, 20, 18, 1, 6, 30) and (d₁, d₂, ... , d₇) = (1, 3, 4, 3, 2, 1, 2)
b) What is Greedy method and discuss its applications. [15]
- 5.a) Solve the following 0/1 Knapsack problem using dynamic programming P= (11, 21, 31, 33), W= (2, 11, 22, 15), C=40, n=4.
b) Consider three stages of a system with r₁=0.3, r₂=0.5, r₃=0.2 and c₁=30, c₂=20, c₃=30 Where the total cost of the system is C=80 and u₁=2, u₂=3, u₃=2 find the reliability design. [15]
- 6.a) Explain the Back Tracking Strategy with an example.
b) State and explain the n-Queen problem using backtracking. [15]
- 7.a) Generate FIFO branch-and bound on the traveling salesman problem and find the solution space tree.
b) What is bounding? Explain the principles of bounding. [15]
8. State and explain cook's theorem and also discuss about NP complete classes. [15]

—oo0oo—

LIBRARY

Sathanjali College of Engg. & Tech.

Cheriyal (V), Keesara (M),

B R Dist., P.O-561 806

Code No: R09220505

R09

SET-1

B.Tech II Year - II Semester Examinations, April-May, 2012
DESIGN AND ANALYSIS OF ALGORITHMS
(COMMON TO COMPUTER SCIENCE AND ENGINEERING, INFORMATION TECHNOLOGY)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

* * * * *

Code No: R09220505

R09

SET-2

B.Tech II Year - II Semester Examinations, April-May, 2012

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to Computer Science and Engineering, Information Technology)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

1. Write an algorithm in pseudo code to count the number of Lower case letters in a file of text. How many comparisons does it do? What is least number of increments it might do? Assume that N is number of characters in a file. Determine its time complexity using step count method? [15]
- 2.a) Explain the Disjoint set operations using trees?
b) Write Find and Union algorithms? [15]
- 3.a) Show how Merge sort sorts the following sequences of keys in ascending order. 12, 22, 33, 44, 48, 56, 57, 65, 76, 84 with a neat diagram representing sequence of recursion calls?
b) Discuss the time complexity of Merge sort? [15]
- 4.a) Explain the 0/1 Knapsack problem.
b) Find an optimal solution to the Knapsack instance n=7, m=15, and (P₁, P₂, ..., P₇) = (10, 5, 15, 7, 6, 18, 3) and (W₁, W₂, ..., W₇) = (2, 3, 5, 7, 1, 4, 1). [15]
- 5.a) What do you mean by forward and backward approach of problem solving in Dynamic programming?
b) Define merging and purging rules in 0/1 Knapsack problem. [15]
- 6.a) Describe the Backtracking technique to m-coloring graph. Explain with an example.
b) Draw the portion of the state space tree for m-colorings of a graph. [15]
- 7.a) Draw the portion of the state space tree generated by FIFOBB using the variable tuple size for the knapsack instances: n = 5; (P₁; P₂; ; P₅) = (10; 15; 6; 8; 4); (w₁; w₂; ; ; w₅) = (4; 6; 3; 4; 2) and M = 12.
b) Write the control abstraction of LC search. [15]
8. Explain the P, NP, NP-Hard and NP- complete classes? Give relationship between them? [15]

Code No: R09220505

R09

SET-3

B.Tech II Year - II Semester Examinations, April-May, 2012

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to Computer Science and Engineering, Information Technology)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

1. Solve the recurrence relation of formula

$$T(n) = g(n) \quad n \text{ is small}$$

$$T(n) = 2T(n/2) + f(n), \text{ otherwise}$$

when

i) $g(n) = O(1)$ and $f(n) = O(n)$;

ii) $g(n) = O(1)$ and $f(n) = O(1)$.

[15]

2. Two sets S_1 and S_2 are given as below

$$S_1 = \{1, 2, 4, 6\} \text{ and } S_2 = \{7, 8\}$$

a) Draw disjoint sets S_1 and S_2 using Trees

b) Draw disjoint sets S_3 using Trees such that $S_3 = S_1 \cup S_2$

c) Draw disjoint sets S_4 using Trees such that $S_4 = S_2 \cup S_1$

d) Give Pointer representation of S_1 , S_2 , S_3 and S_4 .

[15]

- 3.a) Discuss Control abstraction for divide and conquer strategy.

b) By applying Divide and Conquer strategy, write a recursive algorithm for finding the maximum and the minimum element from a list.

[15]

- 4.a) Find the feasible solution for job sequencing with deadlines for the instance $n=5$, $(P_1, \dots, P_5) = (20, 15, 10, 5, 1)$ and $(d_1, \dots, d_5) = (2, 2, 1, 3, 3)$.

b) Explain the 0/1 knapsack problem algorithm with Greedy concept.

[15]

5. Design a three stage system with device types D_1 , D_2 , D_3 . The costs are Rs.30, Rs.15 and Rs.20 respectively. The cost of the system is to be not more than Rs.105. The reliability of each device type is 0.9, 0.8 and 0.5 respectively.

[15]

- 6.a) Explain the 4-Queen problem using backtracking?

b) Draw the permutation tree by taking implicit constraint, explicit constraint and bounding functions?

[15]

7. Consider the Travelling salesperson instance defined by the cost matrix.

$$\begin{bmatrix} \infty & 11 & 10 & 9 & 6 \\ 8 & \infty & 7 & 3 & 4 \\ 8 & 4 & \infty & 4 & 8 \\ 11 & 10 & 5 & \infty & 5 \\ 6 & 9 & 5 & 5 & \infty \end{bmatrix}$$

- a) Obtain the reduced cost matrix

b) Using a state space tree formulation, obtain the portion of the state space tree that will be generated by LCBB. Label each node by its c^\wedge value. Write the reduced matrices corresponding to each of these nodes.

[15]

- 8.a) Briefly explain the concepts of the NP-Hard and NP-Complete?

b) Explain non deterministic algorithms? Give some examples?

[15]

Code No: R09220505

R09

SET-4

B.Tech II Year - II Semester Examinations, April-May, 2012

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to Computer Science and Engineering, Information Technology)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain the performance analysis of an algorithm.
b) Write an algorithm for recursive binary search? [15]
2. Write and explain the final algorithm for collapse rule with an example. [15]
- 3.a) Show how quick sort sorts the following sequences of keys in ascending order.
12, 25, 35, 43, 48, 59, 77, 85, 86, 94?
b) Discuss the time complexity of the quick sort algorithm for the above case? [15]
- 4.a) Explain the control abstraction of Greedy method compare this with Dynamic programming.
b) Write Kruskal's algorithm that generates minimum spanning tree for every connected undirected graph. [15]
5. The edge length of a directed graph are given by the below matrix. Using the Traveling salesperson algorithm, calculate the optimal tour. [15]
- $$\begin{bmatrix} 0 & 20 & 30 & 10 & 11 \\ 15 & 0 & 16 & 4 & 2 \\ 3 & 5 & 0 & 2 & 4 \\ 19 & 6 & 18 & 0 & 3 \\ 16 & 4 & 7 & 16 & 0 \end{bmatrix}$$
6. Define the following terms: state space, explicit constraints, implicit constraints, problem state, solution states, answer states, live node, E-node, dead node, bounding functions. [15]
- 7.a) Describe the Traveling Salesperson Problem in Branch & Bound.
b) Explain the principles of FIFO & LC Branch & Bound? [15]
8. What are differences between NP-Hard and NP-Complete classes? Explain with examples. [15]

AR18

Course Code: 18CS3201

Geethanjali College of Engineering and Technology (Autonomous), Hyderabad
III B.Tech (CSE) II Semester (Regular) Examinations, July 2021

Web Technologies

Time: 3 hours

Answer any five questions

5 X 14M = 70M

- 1 a. Design the HTML code for the following table representing the class timetable. 7M
- | | | |
|---------|--------------------------------|---------------------------------|
| Monday | Web Technologies | Computer Networks |
| Tuesday | Web Technologies Lab (Batch 1) | Computer Networks Lab (Batch 2) |
- b. Create a simple HTML page which demonstrates the use of the various types of lists with examples.
- 2 a. Develop a script using JavaScript that checks the given input for a valid name, password length more than 6 characters and age field in the range of 1 to 99. Also write the appropriate HTML code to implement this script.
- b. Describe the events: onChange and onBlur with appropriate code snippets using HTML and JavaScript.
- 3 a. Write an XML Schema for Library Information Management. 7M
- b. Give the syntax of an XML document and explain how a basic XML document is created with an example 7M
- 4 a. Compare and contrast the different types of XML parsers. Briefly explain DOM Parser with example program. 7M
- b. Differentiate XML Document type definition and XML Schemas with respect to their advantages and disadvantages. 7M
- 5 a. Explain the session tracking with suitable example. 7M
- b. Infer the need of Cookie. Design the servlet for storing cookie on the user's machine. 7M
- 6 a. List out implicit JSP scripting objects and explain any three of them. 7M
- b. Discuss how database connectivity is achieved from a JSP page with an example. 7M
- 7 a. Design a program to fetch data from MySql using PHP. 7M
- b. Write about the following built-in functions: join() and substr(). 7M
- 8 a. Explain the syntax for 'foreach' loop with example in PHP. 7M
- b. Mention and illustrate the different types of arrays in PHP. 7M

AR16

**Course Code: 16CS3101
Geethanjali College of Engineering and Technology (Autonomous), Hyderabad
III B.Tech (CSE) I Semester (Supplementary) Examinations, December 2021**

WEB TECHNOLOGIES

Time: 3 hours

**Answer All Questions
PART-A**

**Max. Marks: 70
 $10 \times 2M = 20M$**

1. a. Explain tag with an example.
b. What are the advantages of CSS.
c. What is the purpose of XML?
d. What is the purpose of XML schema?
e. What is a ResultSetMetaData?
f. What is the difference between GenericServlet and HttpServlet.
g. Explain the difference between servlets and jsp.
h. List JSP implicit objects.
i. Write about Chop() function in PHP.
j. Write a program in PHP to calculate square root of the given number.

PART-B 5 X 10M = 50M

2. a. What are the different types of lists in HTML? Explain how these lists are created in HTML with suitable examples. 6M
b. Write a JavaScript for finding the factorial of the given number. Read input from the user. 4M

OR

3. Create a HTML document that has two rows of frames with two frames in each row. The top left frame must display heading "Subjects in II B.Tech I Semester" followed by the subjects. The bottom left frame must display the heading "Subjects in II B.Tech II Semester" followed by the subjects. Each subject in the left frames must be a link to a document that is displayed in the right frame when the link is clicked. The documents in the right frames are short descriptions of the subjects. 10M
4. Create valid XML document and explain how to process the document using DOM parser. 10M

OR

5. Create XML document and write DTD for books catalog where each book element has the following child elements: author, title, price, publish_date. The author element has the child elements lastname and firstname. 10M

6. Create a HTML Form to accept student's information and write a servlet program to insert the student details into student table. 10M

OR

7. How to handle HTTP requests and responses. Illustrate with an example servlet program. 10M

8. Write about various jsp implicit objects. 10M

OR

9. a. Write a JSP to accept users name and then welcome the user by their name. 5M
b. Write a JSP that displays current date and time. 5M

10. Define Cookie. What is the need of it? Write a PHP program for creating and accessing Cookies? 10M

OR

11. a. Write a PHP program for searching an element in an array. 5M
b. Explain about string functions in PHP. Demonstrate with an example. 5M

R13

Code No: 126EP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year II Semester Examinations, May - 2016

WEB TECHNOLOGIES

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (25 Marks)

- 1.a) Give any two advantages of PHP. [2]
- b) How can you create array in PHP? Explain. [3]
- c) Discuss the common tags of XHTML. [2]
- d) How can you declare attributes in XML? Give an example. [3]
- e) What does Servlet config interface do? [2]
- f) When a Servlet accepts a call from a client, it receives two objects. What are they? [3]
- g) What is Session tracking? Explain. [2]
- h) What is the purpose of using Cookies? How they are created? [3]
- i) What is the difference between GET and POST method in Java Script? [2]
- j) How does one access cookie in a java script? [3]

PART - B (50 Marks)

- 2.a) Discuss about various functions used in PHP with examples.
- b) Write a PHP script to add and remove users from a MySQL table. [5+5]

OR

- 3.a) Describe about various types of PHP interpreters.
- b) Write a PHP script for searching a website URL for a keyword or sentence. [5+5]

- 4.a) Explain document structure description with example code in XML.
- b) What are the XML namespaces and how are they declared? [5+5]

OR

- 5.a) Explain about various types of XML parsers.
- b) How are XHTML elements and attributes represented in the java script binding to DOM? Explain. [5+5]

- 6.a) Write note on Common Gateway Interface (CGI).
- b) What potential advantages do servelets have over CGI programs? Explain. [5+5]

OR

- 7.a) Describe the life cycle of a java servlet and write a simple servlet that reads three parameters from the form data.
- b) Explain the differences between Generic Servlet and HttpServlet. [5+5]

- 8.a) Discuss about the features of JSP pages.
b) Write in brief about JSP tag extensions and libraries. [5+5]
- OR**
- 9.a) How does a Servlet communicates with a JSP page? Explain.
b) What is Bean? Discuss how to create beans in JSP. [5+5]
- 10.a) Explain various operators and data types available in java script.
b) Explain Document Object Model with suitable examples and code. [5+5]
- OR**
- 11.a) Explain about object, methods and events in Java Scripts.
b) Write short notes on simple Ajax application. [5+5]

---ooOoo---

R13

Code No: 126EP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B Tech III Year II Semester Examinations, October/November - 2016

WEB TECHNOLOGIES

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- | | | |
|------|--|-----|
| 1.a) | How to create a text file in PHP? | [2] |
| b) | What is the use of \$ symbol in PHP? Explain it with an example. | [3] |
| c) | Explain about the purpose of DTD. | [2] |
| d) | Derive naming rules in XML. | [3] |
| e) | What are the advantages of servlets over CGI? | [2] |
| f) | Can we use java as the CGI language? If yes, How? | [3] |
| g) | Is it possible for one JSP to extend another java class? If yes how? | [2] |
| h) | Define JSP. Mention its use. | [3] |
| i) | How to insert JavaScript Code in PHP? | [2] |
| j) | Explain this keyword in JavaScript. | [3] |

PART - B

(50 Marks)

- | | | |
|-----------|--|-------|
| 2.a) | Define operator? Explain different operators used in PHP. | |
| b) | Write a program to explain about the concept of arrays in PHP. | [5+5] |
| OR | | |
| 3.a) | Define Session and Cookies. Explain with an example program. | |
| b) | List and explain the control structures used in PHP. | [5+5] |
| 4. | Briefly explain the SAX Parsers in java. | [10] |
| OR | | |
| 5.a) | Explain XML schema languages. | |
| b) | Write a short note on DOM. | [5+5] |
| 6.a) | What are the two objects that a servlet receives when it accepts a call from client? | |
| b) | How does server side programming differ from client side programming? | [5+5] |
| OR | | |
| 7.a) | Differentiate between the single threaded and multi threaded servlet method. | |
| b) | Mention two web servers that support CGI programming. | [5+5] |

8. What is the key difference between Http servlet Response. send Redirect() and <jsp:forward>? Explain. [10]
- OR**
9. How to use Cookies and session for session tracking? Explain with an example program. [10]
- 10.a) With an example program, explain form validation concept in JavaScript.
b) Write a short note on Event handlers in JavaScript. [5+5]
- OR**
11. Define client side programming. Explain briefly about AJAX. [10]

---ooOoo---

Operating Systems

Time: 3 hours

Answer All Questions

PART-A

Max. Marks: 70

10 X 2M = 20M

1. a. State the objectives of Operating Systems.
- b. List the advantages of user OS interface.
- c. Sketch the process state diagram.
- d. Explain use of Dispatcher.
- e. Neatly draw the Multi step processing of a user program.
- f. Describe use of Thrashing.
- g. Label the common file types.
- h. Sketch the booting from disk in windows 2000.
- i. Name the Conditions of occurring Deadlock.
- j. Draw neatly the Multics ring Structure.

PART-B

5 X 10M = 50M

2. a. Summarize the evolution of operating systems.
- b. Recall the System calls and its types.

OR

3. a. State the functions of Operating systems.
- b. Describe the operating system services.

4. a. Write a short note on Threads.
- b. Elaborate the classic software based solution for the Critical section problem.

OR

5. a. Solve the problem using Round robin Algorithm and find Average waiting time, Time quantum 4 ms. Process:P1, P2, P3 Burstable:24, 3, 3.
- b. List the approaches for the classic problem of Synchronization and explain any one approach

6. a. Justify how dynamic storage allocation problem helps contiguous memory allocation.
- b. Illustrate the mechanism of Segmentation process in Hardware.

OR

7. a. Develop the Swapping of two processes using a disk as a backing store.
- b. Solve the problem and find number of page faults in Optimal page replacement using the reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 when page frames are 3.

8. a. Evaluate how file system mounting happens, its pros and cons.
- b. Generalize the Free-space management in Grouping and counting.

OR

9. a. Explain the Storage structure of Solaris file system.
- b. Illustrate SSTF Disk scheduling mechanism by using queue 98, 183, 37, 122, 14, 124, 65, 67. head starts at 53 and find the head movement to reduce number of cylinders.

10. a. Design and develop the Resource-Allocation graph algorithm.
- b. Extend the Role-based access control in Solaris 10.

OR

OPERATING SYSTEMS

Answer All Questions

Time: 2.5 hours

Max. Marks: 70

Explain evolution of operating systems.

OR

Explain the purpose of system calls and discuss the system calls related to process control and communication in brief.

3

What is semaphore? Explain its implementation as wait and signal for providing process synchronization.

OR

4 What are the components of process control block? Explain.

5 What is Thrashing? What is the cause of Thrashing? How does the system detect Thrashing? What can the system do to eliminate this problem?

OR

6 Consider the reference string: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 for a memory with three frames. Trace FIFO, optimal, and LRU page replacement algorithms.

7 Write in detail about file attributes, operations and types and structures.

OR

8 Explain the three allocation methods in file system implementation. Illustrate with proper diagram.

9 What is an access matrix? Explain access matrix implementation.

OR

10 How does deadlock avoidance differ from deadlock prevention? Write about deadlock avoidance algorithm in detail.

Consequently
Linked list
Created.

Operating Systems

Time: 3 hours

Answer any five questions

5 X 14M = 70M

- 1 a✓ Discuss the operating system services. 7M
- b✓ Elaborate the types of System calls. 7M
- 2 a✓ Discuss the Importance of Process Control Block in Process management. 7M
- b✓ Solve the Shortest job first scheduling using Process: P1, P2, P3, P4. Arrival times: 0, 1, 2, 3, Burst time: 8, 4, 9, 5. Calculate average waiting time. 7M
- 3 a Discuss the need of Multi-processor scheduling. Give example with any one approach. 7M
- b Explain the role of Dining Philosophers problem in Classical Synchronization. 7M
- 4 a Explain how inverted page tables helps in the structure of the page table. 7M
- b✓ Solve the problem and find number of page faults in Least recently used page replacement using the reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. Assume the number of frames as 3. 7M
- 5 a✓ Justify "Swapping in Memory management is useful". 7M
- b✓ Write short note on the performance of Demand Paging. 7M
- 6 a Identify the Access methods of file system. 7M
- b✓ Illustrate SCAN scheduling by using queue 98, 183, 37, 122, 14, 124, 65, 67. Head starts at 53 and find the head movement to reduce number of cylinders. 7M
- 7 a✓ Illustrate deadlock detection based on the following table. 7M

Process	Allocation			Request			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	0	0	0	0	0	0
P1	2	0	0	2	0	2			
P2	3	0	3	0	0	1			
P3	2	1	1	1	0	0			
P4	0	0	2	0	0	2			

- b Differentiate Access Matrix with Copy Rights and Owner Rights. 7M
- a Defend how Resource Allocation Request algorithm support Bankers algorithm to avoid Deadlock. 7M
- b Discuss the Revocation of Access rights in Access control. 7M