Sr. No. 101011 Roll No_____

M.TECH. (CSE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: COMPUTER SYSTEM SOFTWARE; PAPER CODE: 13110101)

TIME: 03:00 Hrs. **Max. Marks: 100**

Instructions:-

1. Write your Roll no. on the Question paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regards, If any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt Four (04) questions from Q.No.-2 to Q.No.6. Parts of a question should be attempted in sequence order. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Answer the followings: **(4x5=20)**

a) What are the primary goals in the design of UML?
b) What is UML activity diagram?
c) What are the main advantages of object oriented development?
d) Define deployment diagram.

Q.2. a) What do you mean by Object Oriented Programming? Explain the concept of classes and objects. **(10)**
b) Explain Dynamic Linking? **(10)**

Q.3. a) Draw Use case diagram for Online Shopping. **(10)**
b) What do you mean by class diagram? Where it is used and also discuss the steps to draw the class diagram with any one example? **(10)**

Q.4. a) Differentiate between the following:- **(10)**
(i) Complier& Interpreter
(ii) Loader and Linker
b) Draw the flow chart of first pass assembler. Give the details of various tables employed by an employer. **(10)**

Q.5. a) Draw neat sketch of all UML Diagrams of banking system. **(10)**
b) Difference between class notation and object notation in UML. **(10)**

Q.6. a) State and Explain package cohesion and package coupling principles. **(10)**
b) List & explain the various tables employed by a macro processor. **(10)**

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Sr. No. 101012 Roll No_____

M.TECH. (CSE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE)
(PAPER CODE: 13110102)

TIME: 03:00 Hrs. **Max. Marks: 100**

Instructions:-

1. Write your Roll no. on the Question paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regards, If any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt Four (04) questions from Q.No.-2 to Q.No.6. Parts of a question should be attempted in sequence order. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. **Answer the followings:** **(5x4=20)**

a) Construct a DFA accepting all strings over {a, b} ending in ab.

b) Write and discuss Arden method for converting NFA to DFA.

c) Prove that $(a + b)^* = a^*(ba^*)^*$

d) Let L be the set of all Palindromes over {a,b}. Construct a Grammar G generating L.

e) Write short note on Primitive recursive functions.

Q.2. **a)** Convert the following Mealy machine to Moore Machine. **(10)**

Present State	Next State			
	Input a=0		Input a=1	
	State	Output	State	Output
→q1	q3	0	q2	0
q2	q1	1	q4	0
q3	q2	1	q1	1
q4	q4	1	q3	0

b) Construct a minimum state automaton equivalent to the following finite automaton: **(10)**

State/∑	0	1
→q0	q1	q5
q1	q6	q2
(q2)	q0	q2
q3	q2	q6
q4	q7	q5
q5	q2	q6
q6	q6	q4
q7	q6	q2

Q.3. **a)** What are the various defects of CFG? Given grammar G: **(10)**

S → AB
A → a
B → C|b
C → D
D → E
E → a

Find an equivalent grammar which is reduced.

b) Reduce the following grammar into GNF: (10)

$S \rightarrow AA \mid a$

$A \rightarrow SS \mid b$

Q.4. **a)** What is Pushdown Automata? How it works? Explain ID for PDA. Explain language accepted by PDA. Also discuss some application of PDA. **(10)**

b) Construct a PDA accepting L= $\{wcw^T \mid w \text{ belongs to } \{a,b\}^* \}$. **(10)**

Q.5. **a)** Discuss Halting Problem of Turing machine. **(8)**

b) Explain the ID and move of Turing Machine. Design a Turing Machine that accepts: **(12)**

$L = \{0^n 1^n \mid n \geq 1\}$.

Q.6. **a)** Write and briefly explain the characteristics of each class of grammars classified according to Chomsky Hierarchy. **(10)**

b) What is Post Correspondence Problem? Does the PCP with two lists x= {b, bab3, ba} and y= {b3, ba, b} have a solution. **(10)**

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Sr. No. 101013

Roll No_____

M.TECH. (CSE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: ANALYSIS AND DESIGN OF ALGORITHMS; PAPER CODE: 13110103)

TIME: 03:00 Hrs. **Max. Marks: 100**

Instructions:-

1. Write your Roll no. on the Question paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regards, If any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt Four (04) questions from Q.No.-2 to Q.No.6. Parts of a question should be attempted in sequence order. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Answer the followings: **(4x5=20)**

a) Calculate the time complexity of the given recurrence relation: $T(n)=5T(n/2) + \text{Log } n$.

b) Explain divide and conquer approach.

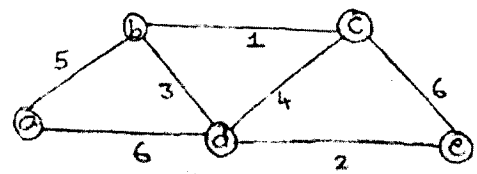
c) Differentiate between Prim's and Krushkal algorithm.

d) Sort the following elements using merge sort: 78, 29, 35, 44, 12, 5, 67, 57 and 69.

Q.2. a) Write the quick sort algorithm. Analyze its efficiency. Apply the algorithm to sort the list {4, 1, 6, 3, 9, 2, 7, and 5}. **(10)**

b) Explain various asymptotic methods used to represent the rate of growth of running time of algorithms. **(10)**

Q.3. a) Apply prim's algorithm for the following graph and find MST: **(10)**



b) Explain bellman ford and dijkstra algorithm. **(10)**

Q.4. a) Explain N-Queens Problem in detail. **(10)**

b) Explain the concept of backtracking using graph coloring problem. **(10)**

Q.5. a) State and proof Cook's theorem. **(10)**

b) Explain in detail NP hard and NP completeness problem. **(10)**

Q.6. a) Explain any one string matching algorithms. **(10)**

b) Explain knapsack problem in detail. **(10)**

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Sr. No. 101014 Roll No_____

M.TECH. (CSE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: INTERNET & WEB TECHNOLOGY; PAPER CODE: 13110104)

TIME: 03:00 Hrs. **Max. Marks: 100**

Instructions:-

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt Four (04) questions from Q.No.-2 to Q.No.6. Parts of a question should be attempted in sequence order. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Write short notes on the followings: **(4x5=20)**

a) Switch.
b) Search Engines.
c) Bookmarks.
d) Web Browsers.

Q.2. a) What do you understand by Mobile routing? Explain briely. **(10)**
b) What is Internet protocol model? Explain in detail. **(10)**

Q.3. a) Explain routing in Unicasting and Multicasting environment. **(10)**
b) What do you understand by WWW proxies? Discuss with examples. **(10)**

Q.4. a) What do you understand by web crawler? Define its types in details. **(10)**
b) Explain architecture of search engines with examples. **(10)**

Q.5. a) What is Document Object Model? What are DOM methods? **(10)**
b) Write a program in HTML for creating Registration Page with the help of HTML tags. **(10)**

Q.6. Write short notes on the followings: **(4x5=20)**

a) Hub
b) HTTP
c) Cookies
d) XML

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