1807E214

Candidate's Seat No :_____

M.Tech. (Sem.-1) (N.C.) Examination

Mobile Adhoc Networks

Time : 3-00 Hours] **July 2019** **[Max. Marks : 100**

SECTION-I

Q-1 [18]

[A] What are the Issues in designing MAC protocol for ad hoc wireless networks?

[B] How routing in ad hoc wireless network differ from wired network?

[C] Explain the AODV route request procedure with example topology. Which information is to be supplied by intermediate node?

Q-2 [16]

[A] Describe commercial applications of MANET.

[B] Explain contention based protocols with reservation mechanism for Ad Hoc Wireless Networks

[C] Explain AODV(Ad hoc on demand distance vector protocol) route reply procedure.

[D] Differentiate slow hopping and fast hopping in frequency hopping spread spectrum.

OR

Q-2 [16]

[A] How AODV handles following problem?

(i) Count to infinity

(ii) Duplicate suppression

[B] Explain contention based protocols with scheduling mechanism for Ad Hoc Wireless Networks

[C] How MAC protocols are classified?

[D] How does cellular and ad hoc network differ?

Q-3 Attempt any two [16]

[A] Explain working of destination sequenced distance vector protocol.

[B] Write working of DSR(Dynamic source Routing) protocol.

[C] How clustering can add efficiency in routing? How clusters are formed?

SECTION - 2

Q-4 [18]

[A] What are proactive and reactive routing protocols? What is the trade off?

[B] Explain black hole attack and IP spoofing.

[C] How the scenarios in routing get complicated when the links in ad hoc networks are not bidirectional?

Q-5 [16]

[A] Which information is stored in routing table of AODV?

[B] What is the need of secure routing?

[C] Explain following in transmission process of ad hoc network

(i) Fading

(ii) interference

[D] Which services in ad hoc network get affected by Sybil attack?

OR

Q-5 [16]

[A] Explain how to detect Sybil attack?

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|B| What is best suitable for ad hoc network? Time division multiple access or collision division multiple access?

|C| What are the issues and challenges in providing Quality Of Service in ad hoc wireless networks?

|D| Explain the two methods of establishing tunnel in case of wormhole attack.

|16|

Q-6 Attempt any two.

|A| What are the fundamental differences between wired network and ad hoc wireless networks?

|B| Explain the forward path setting and reverse path setting in AODV(Ad hoc on demand distance vector protocol).

|C| How key management is done in ad hoc network?

1507E0198

Candidate's Seat No :_____

M.Tech. (N. C. & W. T.) (Sem.-1) Examination
Design and Analysis of Algorithms
July 2019

Time : 3-00 Hours] **[Max. Marks : 100**

Note : (1) Write both the sections in the separate answer books
(2) Figures to the right indicate full marks.
(3) Make necessary assumptions wherever necessary.

SECTION-I

Q.1 Attempt the following (**Any three**) : [18]

(a) Suppose we are comparing implementation of insertion sort and merge sort on the same machine. For inputs of size n, insertion sort runs in $8n^2$ steps, while merge sort runs in $64n \lg n$ steps. For which values of n does insertion sort beat merge sort?

(b) Explain Divide and Conquer approach to solve a problem. How is it applied to merge sort algorithm?

(c) How are the shortest-path and traveling-salesman problems similar? How are they different?

(d) Where in a max-heap might the smallest element reside, assuming that all elements are distinct? Is the array with values $\langle 23,17,14,6,13,10,1,5,7,12\rangle$ a max-heap? In the array representation for string an n-element heap, what are the indexes of leave nodes?

Q.2 (a) Write pseudo code of INSERTION – SORT and illustrate its operation on the array A = {31, 41, 59,26,41,58 } [8]

(b) Illustrate procedure MERGE (A,p,q,r) for two sorted subsequences {3, 26, 41, 52} and { 9, 38, 49, 57 } [8]

OR

Q.2 (a) Explain loop invariant property. Define loop invariant used to establish the correctness of INSERTION SORT(A) and use it to prove correctness of it. [8]

(b) What is asymptotic notation? Why is it needed? Explain O notation. Show that $2n^3 + 4n^2 \log n$ is $O(n^3)$. [8]

Q.3 Attempt the following (**Any two**) : [16]

(a) Use the master method to give tight asymptotic bounds for the recurrence: T(n) = 9 T (n/3) + n

(b) What is priority queue? Write the pseudocode for implementing the

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insert operation on a priority queue. Illustrate MAX-HEAP-INSERT(A,10) on the heap A = < 15,13,9,5,12,8,7,0,6,2,1>.

(c) Explain class P, class NP and NP – Complete with examples. Give one example of a similar appearing pair of problems, where one is P and other is NP – Complete.

SECTION-II

Q.4 Answer the following (18)

(a) Compare and contrast - Divide and Conquer approach, Dynamic programming and greedy algorithm.

(b) Explain the sequence of steps to be carried out while developing a dynamic programming algorithm/solution.

(c) Write the properties of red-black trees and explain the LEFT rotation.

Q.5 Answer the following [16]

(a) Define single-source shortest path problem. What do you understand by edge relaxation? Explain.

(b) Give pseudo code of Digjaksta's Algorithm for solving single source shortage path problem. Explain its working in your own words.

OR

Q.5 Answer the following [16]

(a) Write the RABIN-KARP-MATCHER algorithm, explain its working and perform the time analysis.

(b) Write RB-INSERT-FIXUP algorithm.

Q.6 Attempt the following (Any Two) [16]

(a) Consider the following 6 activities which require common set of recourses for their execution

start[] = {1, 3, 1, 5, 8, 6, 7};
finish[] = {2, 4, 6, 7, 9, 9, 12};

Write the algorithm to compute maximum set of activities that can be executed. Show the trace of the problem for above set of 7 activities.

(b) Find an optimal perenthesization of matrix-chain product whose sequence of dimensions is ‹ 5,3, 7, 2, 5 ›

(c) Determine an LCS(Longest common subsequence) of {1,0,0,1,0} and {0,1,1}

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1707E209

Candidate's Seat No : _____

M.Tech. (Sem.-1) (N.C. & W.T.) Examination

Internet Programming

July 2019

Time : 3-00 Hours] **[Max. Marks : 100**

SECTION - I

Q1 **Answer / Explain the following in brief: (Give examples wherever necessary) :** **[20]**

a. Name the scalar objects of Python.
b. What is a tuple? Give an example.
c. Write a python program to accept a number and display whether it is even or odd.
d. Write a python program to find the greatest of two numbers.
e. State the library of python used for network programming.
f. What is a list in python?
g. What is the difference between a list and tuple in python.
h. Write a python program to display current date and time.
i. Write a python program to display the list.
j. Write a note on modular programming.

Q2 **Answer the following in Detail: (Any 3) :** **[18]**

a. What is a dictionary? Give an example on usage of dictionary in Python.
b. Write a python program to perform linear search on a list of numbers.
c. Write a python program to print Fibonacci series.
d. Discuss exception handling in python.

Q3 **Answer the following in brief (Any 3):** **[12]**

a. Discuss the difference between UDP and TCP services.
b. Write a program to access a website in python.
c. Write a short note on turtle graphics objects.
d. What do you understand by recursion? Give an example of recursion implementation in python.

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SECTION - II

Q4 **Answer / Explain the following in brief: (Give examples wherever necessary):** **[20]**

a. How is looping construct implemented in python? Give examples.
b. Write a python program that uses function, the function must add two values.
c. Write a python program that uses function, the function must swap the values of variables.
d. Discuss the library functions that are useful in network programming.
e. Discuss how graphics can be used in python programming.

Q5 **Answer the following in Detail: (Any 2) :** **[18]**

a. State different ways to deal with files in python. Given an example code snippet for the same.
b. Write a client server program in python to implement echo service. (In Echo service, client sends a string, the same string is returned back by the server).
c. Write a client server program in python to implement day time service. (The server sends date and time to the client).
d. Write a python program where the server generates random number and sends it to the client. The client must receive the number and display it.

Q6 **Answer the following in brief (Any 3):** **[12]**

a. Write a python program to check whether the input string is palindrome or not.
b. Discuss the notion of 'sets' in python. Explain 'set quantification'.
c. What do your understand by multidimensional list? Give an example.
d. Discuss GET and POST patterns with reference to HTTP. Explain how can it be implemented in python?
