G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC act 1956)

Sixth Semester B. E. (Computer Science & Engineering)

Vacation Examination Summer - 2014

Design and Analysis of Algorithm

Time: 03 hrs.] **[Max. Marks: 60**

Instructions to Candidate:

1) All questions are compulsory.
2) All questions carry marks as indicated.
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.

1. Write a short note on:

   (a) Recurrence Relations and solutions of Recurrence Relations 2

   (b) Bitonic sorting network 2

   (c) Binomial heap 2

   (d) Traveling salesman problem 2

   (e) Backtracking basic strategy 2

   (f) NP-hard and NP-complete problems 2

2. (a) Find single source shortest path from node V_2 to all other vertices in the figure-1 using Bellman-Ford Algorithm. 8

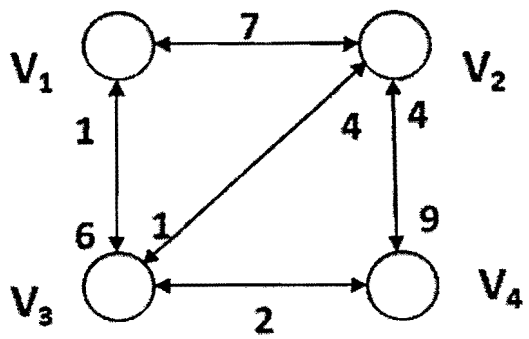

Fig. 1

   (b) Explain the concept of BFS and DFS in brief. 4

3. (a) Find the length of LCS and LCS of following strings: 8
   X = ABCDBD
   Y = ACDB

   (b) What are the principles that a problem must satisfy in order to have Dynamic programming solution.

4. (a) Find Minimum Cost Spanning Tree of Graph in figure-2 using Kruskal's Algorithm

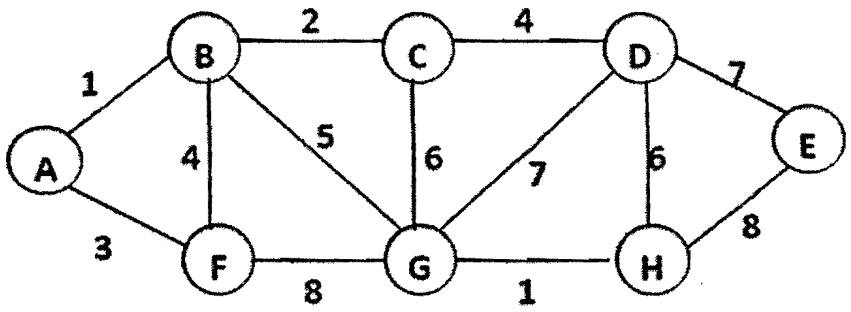

Fig. 2

(b) Four matrices M1, M2, M3 and M4 of dimensions pxq, qxr, rxs and sxt respectively can be multiplied in several ways with different number of total scalar multiplications. When multiplied as (((M1 X M2) X M3) X M4) with p = 10, q = 100, r = 20, s = 5 and t = 80, then the number of scalar multiplications needed is

i. 248000

ii. 44000

iii. 19000

iv. 25000

(c) Calculate the time complexity of following example:

```
int sum(int* data, int N) {
    int result = 0;
    for (int i = 0; i < N; i++) {
        result += data[i];
        }
return result;  }
```

5. (a) What do you mean by polynomial reduction? Discuss diagrammatically the relations among P-class, NP-class, NP-hard and NP-complete.

(b) What is adjacency list? Explain with the help of an example.

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Sixth Semester B. E. (Computer Science & Engineering)

Vacation Examination Summer - 2014

Mobile Computing

Time: 03 hrs.] **[Max. Marks: 60**

Instructions to Candidate:

1) All questions are compulsory.
2) All questions carry marks as indicated.
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.

1.		**Answer the following:**	12
	(a)	List Signal Propagation effects	
	(b)	State Piconet	
	(c)	Draw DHCP	
	(d)	Difference between a Adhoc and Sensor network	
	(e)	Explain DTD In XML	
	(f)	List various application of Android	
2.	(a)	Discuss Spread spectrum techniques	5
	(b)	Explain working of Mobile IP	5
3.	(a)	State advantages and disadvantages of SDMA/TDMA/FDMA/CDMA	8
	(b)	State Design goals for wireless LANs	2
4.		Solve **Any Two:**	
	(a)	Explain Mechanism, Advantages and Disadvantages of Indirect TCP, Snoopy TCP and, mobile TCP	5
	(b)	Describe architecture of WAP gateway	5
	(c)	List Applications of Wireless Sensor Networks.	5
5.		Solve **Any Two:**	
	(a)	Why is XML superior to other forms of data exchange?	5
	(b)	Discuss the main tags of WML	5
	(c)	Differentiate between WML- Script and Web- based scripting languages.	5
6.		List the Steps to create your first Android Application	8

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Sixth Semester B. E.

(Computer Science & Engg./ Electronics Engineering / Electronics & Telecommunication Engg.)

Vacation Examination Summer - 2014

Computer Graphics & Visualization (Elective-I)

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) All questions carry marks as indicated.
3) Illustrate your answer wherever necessary with the help of neat sketches.
4) Use graph paper for **Q. 3** only.

(a)	Specify the steps of DDA algorithm?	2
(b)	Explain Averaging using weights?	2
(c)	Explain Exterior Defined regions?	2
(d)	Apply y-shear on NDC (Normalized Device co-ordinates)	2
(e)	Define Object Model and Image Model.	2
(f)	What are the requirements in the design of curved Surface?	2
(a)	Rasterize the line $y = 2x + 10$ using DDA Algorithm.	5
(b)	Generate a circle in first quadrant counter clockwise direction with radius 5 using Bresenhams circle generation algorithm.	5
(a)	Fill a polygon having co-ordinates A(1, 1), B(8, 1), C(8, 6), D(5, 3) and E(1, 7) using Simple Ordered Edge list algorithm.	5
(b)	Fill a polygon region defined by A(1,1), B(8,1), C(8,4), D(6,6) and E(1,6) using seed fill algorithm	5

3. Answer **Any Two**

(a)	Magnify a triangle defined by the vertices A(1,1), B(2,2) and C(5,2) to twice in X direction only and then rotate by 60 degree in anticlockwise direction, keeping point C invariant. Give the co-ordinates of new triangle?	5
(b)	Prove that the scaling and rotation about the origin are not commutative.	5
(c)	Find the normalized transformation that maps window from (1,1) to (10,10) on to the view port whose lower left corner (1/4,0) and upper right corner is (3/4,1/2).	5

5. Answer **Any Two**

(a)	Explain Parallel Projection?	5
(b)	Explain Warnock's Algorithm with suitable example?	5
(c)	Window is defined by the co-ordinates from (0, 0) to (40, 40). Clip a line segment with end-point A(-10, 20) and B(50, 10) using Sutherland Cohen Mid-Point Subdivision algorithm?	5
6. (a)	Explain Basic Ray Tracing algorithm?	4
(b)	Explain Hermite Spline?	4

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Sixth Semester B.E. (Computer Science & Engineering)

Vacation Examination Summer - 2014

Java Programming (Elective-I)

Time: Three hours.] **[Max. Marks: 60**

Instructions to Candidate:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Illustrate your answer wherever necessary with the help of neat sketches.

1.	(a)	Why java is called as platform independent language	2
	(b)	Differentiate between classes and interfaces	2
	(c)	Explain the use of 'instanceof' operator in java	2
	(d)	Explain the use of abstract and final keyword in java	2
	(e)	Write a short note on "Generics in Java"	2
	(f)	Compare J2SE versus J2ME and J2EE	2
2.	(a)	Write a java program that find out reverse of a number passed through command line.	4
	(b)	Write a java program that implement stack in java with push and pop operation.	5
	(c)	Explain method overloading with example.	3
3.	(a)	What is package in java? Specify its advantages. Explain the use of package with suitable example.	6
	(b)	Explain Exception Handling in java and specify its advantages .Explain the use of Exception Handling with suitable example.	6
4.	(a)	Write a java program that show use of multithreading by extending Thread class	6
		OR	
	(a)	Write a Java program that creates three threads. First thread displays "Good Morning"every one second, the second thread displays "Hello"every two seconds and the third thread displays "Welcome"every three seconds.	6
	(b)	Explain Thread Life Cycle with suitable diagram.	3
	(c)	Write a java program that show use of interface with suitable example.	3
5.	(a)	Write a java program for sorting a given list of names in ascending order passed through command line using compareTo () method of String class.	4
		OR	
	(a)	Develop java applet that displays a simple message "G.H.R.C.E.Nagpur".	4
	(b)	write java program that reads a file name from the user, then display information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.	4
	(c)	Write a java program to retrieve parts of URL using different methods of URL class of java.net package.	4