Department of Computer Science and Engineering
Begum Rokeya University, Rangpur.
3rd Year 2nd Semester Final Examination, 2012.

Course Title: Distributed System
Course Code: CSE- 3201

Full Marks: 50

Answer Any Five from the Given Questions

(Note: Numbers in the right margin indicate marks for each question.)

1. (a) What is distributed system? What are significant advantages and limitations of distributed system? 1+2
   (b) Explain the difference between intranet and internet. Give some examples of Distributed system 2+1
   (c) Give five types of hardware and five types of data/software resources that can be shared. Give examples of their sharing as it occurs in distributed system. 4

2. (a) Why scalability is an important feature in the design of a distributed system? Discuss some of the guiding principles for designing a scalable distributed system. 4
   (b) What are the uses of web services? What is the purpose of heterogeneity mobile code? 1.5+1.5
   (c) How the resource sharing is done in distributed system? Explain with example. 3

3. (a) In DS we are familiar with two system models. What are the purposes you think to categorize system models in these two types? 1.5
   (b) Describe the two types of system architecture in architectural model with figure. 4
   (c) How does proxy server and caches play role in the variations of architectural model? 2.5
   (d) Define middleware. 2

4. (a) What are the factors that affect the performance of a communication channel? How the performance can be reached at satisfactory level? 2
   (b) Classify omission failure. Hence, Describe how will you recover from "fail-stop and "message dropping" in communicating between computers. 1+1.5
   (c) How message destination is defined in inter-process communication? 2
   (d) Discuss why the representation of data in communication needs to be flattened and how they vary for different machine. What are the methods to overcome it? 2+1.5

5. (a) What are Remote Object and Remote interfaces? Explain with an example. 2
   (b) What information does an IDL holds? 1
   (c) Explain in detail about RPC. 3
   (d) What is the role of PROXY and SKELETON in remote method invocation? Explain with figure. 4

6. (a) What are the public and private keys? What are the differences between public key and private key? 2+2
   (b) What is digital signature? Give a method to create a digital signature. 1+2
   (c) Define block cipher, Stream cipher and Cryptanalysis. 3

7. (a) Describe the importance of Distributed file system over local file system. 1.5
   (b) Write down a comparative description of two popular file systems: Sun NFS and Andrew file system. 3
   (c) Discuss where and when a situation arises in which the name space resolution fails. Give possible suggestions to avoid name space resolution failure. 1.5+1.5
   (d) Discuss the different DNS navigation schemes and comparatively analyze which method is advantageous in real time distributed network scenario. 2.5

Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

3rd Year 2nd Semester Final Examination – 2012 (Session: 2009-2010)

Course Code: CSE 3203 **Course Title:** Software Engineering

Full Marks: 50 Time: 03:00 hrs

(Answer any Five. Figures in the right margin indicate full marks.)

1. (a) Define software Engineering. Discuss the different types of software characteristics. 1+3=4
   (b) What is myth? Discuss the management myth of software industries. 1+3=4
   (c) "Software doesn't wear out"- explain it. 2

2. (a) Describe waterfall model with its limitation and advantages. 3
   (b) Write down the drawback of RAD model. 2
   (c) Describe the milestone in software engineering process and the spiral evolutionary model. 2+2=4
   (d) What is process maturity level? 1

3. (a) Explain 4Ps in context of software engineering. 2
   (b) What are the characteristics of an effective project manager? 2
   (c) What is software metrics? Why size oriented metrics are not so good in every time? 3
   (d) Computer the function point value for a project with the following information characteristics: 3
   No. of user input:32; No. of user output:60; No. of user inquires:24
   No. of files:8; No. of external interface:2
   Assume that all complexity adjustment values are average. Also assume that 14 algorithm have been counted.

4. (a) Define the 'Risk Mitigation'. 1
   (b) Why risk management is important? Develop a form for risk management and insert sample data. 3
   (c) What is "risk decision tree"? Explain with proper example. 3
   (d) What are the differences among functional, non-functional and domain requirements. 3

5. (a) What is SQL? Discuss the SQA activities. 1+2=3
   (b) Explain "defect amplification model" with appropriate example. 4
   (c) Write down the step of statistical quality assurance. 3

6. (a) What are the advantages of DFD over other diagram? Draw a level 1 DFD for a SafeHome software project. 1+2=3
   (b) Define software testing. What are the difference between verification and validation? 2
   (c) What is a "GOOD" test? Define Unit test. 2
   (d) Define black box and white box testing? Describe any of them. 3

7. Write Short notes on the following topics(any four): 2.5x4=10
   (a) FP based estimation (b) Software requirement analysis (c) COCOMO model (d) Alpha and Beta testing (e) Behavioral Modeling.

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Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

3rd Year 2nd Semester Final Examination – 2012 (Session: 2009-2010)

Course Code: CSE 3204 **Course Title:** Computer Networking

Full Marks: 50 Time: 03:00 hrs

(Answer any Five. Figures in the right margin indicate full marks.)

1. (a) Discuss the features of Stop-and-Wait ARQ. 2
(b) What is piggy backing? 2
(c) How does Go-Back-N ARQ differ from selective Repeat ARQ? 2
(d) Broadly describe the operation of Selective-Repeat ARQ protocol. 4

2. (a) Explain the operations of CDMA –multiplexer and CDMA-demultiplexer. 4
(b) Write the properties of orthogonal sequences. 2
(c) How reservation access method is used as a controlled access method. 2
(d) Depict how collision may occur in CSMA? 2

3. (a) Describe a network with three levels of hierarchy. 4
(b) A router outside the organization receives a packet with destination address 190.240.7.91. Show how it finds the network address to route the packet. 2
(c) Write the drawbacks of class A and class C addressing. 2
(d) Find the network address for the following IPs(if possible) 2
i)23.76.7.91 ii)45.56.321.78 iii)132.6.17.85 iv) 256.30.40.77

4. (a) Write some advantages of IPv6 over IPv4. 2
(b) What is RSA public-key cryptosystem? Explain RSA encryption algorithm with the help of an example. 2+3=5
(c) What is public key cryptography(PKC)? Give some advantages and disadvantages of PKC. 3

5. (a) Broadly describe network layer at the source, at a router, and at the destination. 6
(b) Describe binary division in a CRC generator and CRC checker. 4

6. (a) What are the main differences between OSI and TCP/IP reference models? Explain briefly. 3
(b) Discuss in brief MAC frame structure for IEEE 802.3? 3
(c) Discuss Virtual Circuit Switching and Datagram approach? 4

7. Write short note: 2.5x4=10
i. VOIP ii. Hill cipher algorithm iii. ISDN iv. Bluetooth Network

Department of Computer Science and Engineering
Begum Rokeya University, Rangpur.
3rd Year 2nd Semester Final Examination, 2012.

Course Title: System Analysis and Design **Full Marks: 50**
Course Code: CSE- 3206

Answer Any Five from the Given Questions

(Note: Numbers in the right margin indicate marks for each question.)

1. (a) Define System and System analysis? 2
   (b) What are the elements of a system? Can you have a viable system without feedback? Explain. 3
   (c) Distinguish between: 3
      i) Interaction and interdependence
      ii) Open and close system
   (d) How an analysis would determine the user's need for a system? Explain. 2
2. (a) Where do ideas for a proposed system originate? To what extent does the analyst assist in this regard? 2
   (b) What activities make up system design? How does system design simplify implementation? 3
   (c) Why prototyping can be a factor in faster development of system? Describe How. 3
   (d) What Technical qualifications flourished a System Analyst? 2
3. (a) User requirement analysis is always a challenging task. Why? 1.5
   (b) Why user request form is so important in the initial investigation? Explain in detail. 3
   (c) What are internal and external sources of information? 2
   (d) What traditional information gathering tools are available for the analysts? Summarize the advantages and limitations of interview. 3.5
4. (a) Suppose you are given an assignment to observe a computer operator at work, what observation method would you select? Why? 2
   (b) What is structured analysis? How does it differ from traditional approach? 2
   (c) Illustrate some tools of structured analysis. 1
   (d) What basic rules are relevant to constructing a DFD? Draw an overall data flow diagram for the following applications: 5
      i. A Travel agency making round trip reservations for two to Hawaii.
      ii. A system analyst selling professional time by the hour and paying staff salaries.
5. (a) List and Illustrate the primary uses and element of a decision table. 2
   (b) What considerations are involved in feasibility study? Which consideration do you think is the most crucial? Why? 3
   (c) "Many feasibility studies produce disillusions to users and analysts." Do you agree? Why? Explain. 3
   (d) How can you estimate the effort and schedule time for a project that you are going to develop. 2
6. (a) What costs are considered in cost/benefit analysis? Which one do you think is the most difficult to estimate? Why? 3
   (b) Distinguish between: i) Direct and Indirect cost ii) Tangible and Intangible benefits. 2
   (c) You are going to form a company and the initial investment is $3000. What will be your future value of investment after 3 years at 10 percent interest and if you aimed to get $1500 benefits per year what will be your present value of investment considering the time value of money. 5
7. (a) Describe the importance of normalization in developing a system. 1
   (b) Is client-server computing a less expensive alternative than server-based? Why or Why not? 2
   (c) Describe the differences among two-tiered, three-tiered and n-tiered architecture. 3
   (d) With proper diagram show the user interface design process. 4

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Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

3rd Year 2nd Semester Final Examination – 2012 (Session: 2009-10)

Course Code: **CSE 3207** Course Title: **Theory of Computation and Automata**

Full Marks: **50** Time: **03:00 hrs**

(Answer any Five. Figures in the right margin indicate full marks.)

1. **(a)** What do you mean by finite automata? Give classification of finite automata. 1+1=2

(b) What is the language of a DFA? Describe the language of the DFA with the following transition table. 2

	0	1
→A	B	A
*B	B	A

(c) Construct DFAs to recognize each of the following languages over the alphabet {a,b}. 4

i.) The set of strings whose 4th symbol from the left end is b.

ii.) The set of strings containing not more than 3 a's.

(d) Write down the differences between DFA and NFA. 2

2. **(a)** Describe how NFA is used in text searching and search engines. 2

(b) Convert the following NFA to a DFA. 3

	0	1
→p	{p, q}	{p}
q	{r, s}	{t}
r	{p, r}	{t}
*s	ϕ	ϕ
*t	ϕ	ϕ

(c) Design ε-NFAs for the following languages. 4

i) The set of strings consisting of zero or more a's followed by zero or more b's, followed by zero or more c's.

ii) The set of strings consisting of either 01 repeated one or more times or 010 repeated one or more times.

(d) How many states at a maximum does a DFA contain which is constructed from an n-state NFA? 1

3 **(a)** Write regular expressions for the following languages. 2

i.) The set of all strings over {0, 1} containing an even number of 1's.

ii.) The set of all strings over {a, b, c, e} such that each string contains at least one vowel and one consonant.

(b) State different algebraic laws for regular expressions. Simplify the following regular expressions making use of different algebraic laws. 2+3=5

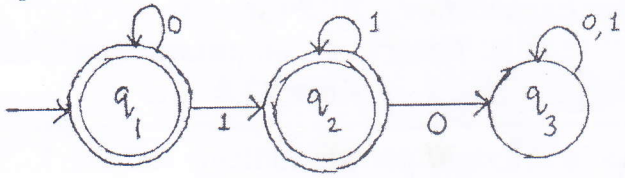
i.) $0 + (1+\varepsilon)(1+\varepsilon)^*0$

ii.) $(\phi^*+\varepsilon+1)^* + \phi^*(\varepsilon+1)^*((\phi^*(\varepsilon+1)^*)^*01^*$

iii.) $\phi(0+1^*)^*(\varepsilon+0+1) + (\varepsilon+0^*+1^*)^*$

(c) If L, M, N are any languages, then prove that L(MUN) = LM U LN 3

4. (a) Briefly describe the state elimination process for converting a DFA to a regular expression. Convert the following DFA to a regular expression using this process. 2+4=6



(b) Mention the closure properties of regular languages. Prove that the complement of a regular language is also regular. 1+2=3

(c) What is regular language? 1

5. (a) If L=L(R) for some regular expression R, then prove that L = L(E) for some ε-NFA E having exactly one accepting state, no arcs into the initial state and no arcs out of the final state. 4

(b) State *pumping* lemma for regular languages. Mention its significance. 2

(c) Using *pumping* lemma, determine if the following languages over the alphabet {0, 1} are regular or non-regular. 2+2=4

i.) $L = \{0^n 110^n \mid n>=1\}$
ii.) $L = \{0^n 1 \mid n>=1\}$

6. (a) Define *CFG*. What kinds of languages are defined using CFG? 1+1=2

(b) Design *CFG*'s for the following languages. 2+2=4

i.) $L = \{a^m b^n \mid n>m\}$
ii.) $L = \{(^n)^n \mid n>=1\}$

(c) Prove that the CFG P → 0P0 | 1P1 | 0 | 1 | ε for *Palindromes* over $(0+1)^*$ accepts all and only palindromes of 0's and 1's. 4

7. (a) Give a left most derivation for the string **aaabbabba** using the following grammar. 3

S → aB | bA
A → aS | bAA | a
B → bS | aBB | b

(b) What is an ambiguous grammar? If G is the grammar, S→SbS | a, then show that G is ambiguous. How can you remove ambiguity from G? 1+2+2=5

(c) Define the language of a grammar. 2