Begum Rokeya University, Rangpur.

Department of Computer Science and EngineeringB.Sc. (Engg.) 4thYear 2nd Semester Final Examination-2014
Course Title: **Web Engineering**; Course Code: **CSE 4202**

2020-00

Total Marks: 50

Time: 3.00 hours

Answer any five form the given question sets.

[Note: Numbers on right margin indicate the marks for each question. Answer the question sequentially]

1.	a)	What is web? Write down the main properties of Web 1.0, Web 2.0 and Web 3.0.	1+3
	b)	What does a Web Designer do? What are the main differences/similarities between a Web Designer and Web Programmer?	2+2
	c)	Why do you use the commands <i>ifconfig</i> and <i>ping</i> ?	2
2.	a)	What is a Web Server? Describe different properties for Apache and Nagix Web Servers.	1+4
	b)	What is MVC? Write and discuss components of MVC? Why should we follow(or not follow) it?	5
3.	a)	How does Requirement Engineering for web Engineering differs from Requirement Engineering for conventional software system? Discuss in brief.	5
	b)	What do you mean by pattern and framework of web application?	3
	c)	What is Cron job? Why do we use it?	2
4.	a)	Write down the differences between Java and Java Script.	3
	b)	What is cross-browser compatibility? How JQuery helps in cross browser compatibility?	4
	c)	Why do we use AJAX? How does AJAX work?	3
5.	a)	Define Hypertext and Hypermedia.	2
	b)	What do you mean by stateful and stateless communication?	2
	c)	What are XML, XSL and DTD? Explain with simple example.	3
	d)	Briefly describe the dimensions of quality in testing web application.	3
6.	a)	What is Web Analytic? Why do we need to use Web Analytic?	3
	b)	What is E-Commerce? How recommender systems help in E-Commerce? Discuss an use-case of recommender system.	7
7.	Wr	ite short notes on four of the followings:	4×2.5
	a)	Web Service	
	b)	REST	
	c)	UDF	
	d)	URL	
	e)	HTTPS	

Begum Rokeya University, Rangpur.

Department of Computer Science and Engineering B.Sc. (Engg.) 4thYear 2nd Semester Final Examination-2014 Course Title: Digital Image Processing; Course Code: CSE 4204

Γotal Marks: 50

Time: 3.00 hours

Answer any five form the given question sets.

[Note: Numbers on right margin indicate the marks for each question. Answer the question sequentially]

1.	a) b) c)	Explain the model for digital image representation. Explain the image formation in the Eye. What is the key difference between boundary and edge in a digital image? For an image pixel p with coordinates (x,y), find the coordinates of N8(p) and N4(p).	4 4 2
2.	a) b)	What is image gradient? Write short notes on Discrete Fourier Transform (DTF). Consider the two image subsets, S_1 and S_2 , shown in the following figure. For V={1}, determine whether these two subsets are (a) 4-adjacent, (b) 8-adjacent, or (c) m-adjacent.	5 5
3.	a)	Define histogram of a digital image. Explain the histogram equalization process with	5
	b)	suitable example. Briefly explain spatial filtering mechanism. Where the filtered pixels (results of filtering) are usually stored during a filtering process and why?	4
	c)	Define Bit –Plane slicing.	1
4.	a) b)	Discuss spatial correlation and convolution with example. Explain and compare ideal low pass filter and Butterworth filter for image smoothing.	5 5
5.	a)	What is image segmentation? Discuss an Edge detection technique with necessary	5
	b)	mathematical details. What is coding redundancy? Construct the Huffman coding scheme for the hypothetical set of source symbols {a ₂ ,a ₆ ,a ₁ ,a ₄ ,a ₃ ,a ₅ } having probabilities {0.4,0.3,0.1,0.1,0.06, 0.04} respectively. Also compute average length the code. Using your constructed coding scheme, decode the encoded string 010100000101111110100.	5
6.	a)	Suppose you want to write an application that would convert a digital photograph to a painted photograph having all the geometric properties of the digital photograph unchanged. How would you solve this problem?	4
	b)	What is pattern recognition? Discuss the structural method of pattern recognition.	3
	c)	Formulate a point detection mask.	3
7.	a)	Define Euclidian, city-block, and chessboard distance metric for pixels p and q with coordinates (x,y) and (s,t).	4
	b)	Define hit-or-miss transformation.	2
	c)	Discuss boundary extraction and region filling algorithm using morphological processing.	4



Begum Rokeya University, Rangpur Department of Computer Science and Engineering B. Sc. (Engg.) 4th Year 2nd Semester Final Examination- 2014 Course: CSE 4206(Simulation and Modeling)

N.		me: 3 hours Full Marks: 50)
a) b)	Ansv The	wer any <u>FIVE</u> of the following <u>SEVEN</u> questions. figures in the margin indicate full marks. uestions must be answered sequentially.	
1.	a) b) c)	What is meant by the term "System Simulation"? How can you classify different types of models? What are the steps in a simulation study? Define each of them with appropriate figure.	2 3 5
2.	a)b)c)	Which points should be considered with importance while designing random number generation subroutines? What is meant by pseudo random number? Why are they called pseudo? Use the linear congruential method to generate at least six pseudo random numbers with $X0=275$, $a=8$, $c=47$ and $m=100$.	3 4
3.	a) b) c)	Why is it necessary to perform randomness tests? What kind of test can be performed? Develop the poker test for (i) Three-digit numbers and (ii) Four-digit numbers. What are the properties of random number?	3 5 2
4.	a) b)	Explain how Koach- curve is generated. Write a short note of "Conceptual Modeling".	5 5
5.	a) b) c)	Which steps should be considered for model building? Explain with figure. Explain calibration and validation of models. What are the goals of validation process?	4 4 2
6.	a) b) c)	What is fractal object? What are its characteristics? Describe different types of fractal objects. Define self-similar fractal.	3 6 1
7.	a) b) c)	Describe the difference between an interpolating spline and Bezier spline. Derive the expression for hermit blending function to generate spline curve Explain the properties of Bezier curve.	3 5 2

Begum Rokeya University, Rangpur Department of Computer Science and Engineering B. Sc. (Engg.) 4th Year 2nd Semester Final Examination- 2014 Course: CSE 4208(VLSI Design)

Time: 3 hours Full Marks: 50

h) T	nswe	er any <u>FIVE</u> of the following <u>SEVEN</u> questions. In the margin indicate full marks. In the mass answered sequentially.	
1.	a)	What do you understand by VLSI design? What are the benefits of VLSI design?	4
1.	b)	With the help of flow chart discuss VLSI design flow. Mention the importance of each step in design flow.	6
2.	a)	Define custom and semi-custom design styles. How can choose of particular design	4
	b)	style for a VLSI product. Describe the criteria of full-custom design quality.	3
	c)	Define regularity, modularity, and locality.	3
3.	a)	What are the basic steps in VLSI fabrication process flow?	6
٥.	b)	Define lambda based design rules used for layout.	4
4.	a)	What do you mean by scaling model and scaling factor?	4
	b)	Discuss in detail the scaling factors for device parameters and show the effects of scaling for constant voltage model.	6
5	2)	What do you mean by MOS capacitor?	1
5.	a) b)	Derive the expression for the threshold voltage of MOS transistor and explain the	6
	c)	significance of different parameters present in the equation. Calculate a threshold voltage V_{T0} at V_{SB} =0, for a polysilicon gate n-channel MOS transistor, with the following parameters: substrate doping density N_A =10 ¹⁶ cm ⁻³ , polysilicon gate doping density N D =2*2 ²⁰ cm ⁻³ , gate oxide thickness t_{ox} =500Å, and oxide-interface fixed charged density N_{ox} 4*10 ¹⁰ cm ⁻² .	3
6.	a)	Describe a brief about the CAD technology for VLSI chip design.	4
	b)	Describe the features of Verilog.	2
	c)	What is Selected Signal Assignment Statement? Write syntax in VHDL.	4
7	. a)		6 .
	b	external bias. List out the advantage of CMOS over nMOS. Describe the structural decomposition of a four bit adder, showing the level of hierarchy.	1+3

Begum Rokeya University, Rangpur Department of Computer Science and Engineering B. Sc. (Engg.) 4th Year 2nd Semester Final Examination- 2014 Course: CHM 1224(Chemistry)

Full Marks: 50 Time: 3 hours N.B. a) Answer any **FIVE** of the following **SEVEN** questions. b) The figures in the margin indicate full marks. c) All questions must be answered sequentially. Discuss Bohr's model of the atom. How does it account for hydrogen spectra? What are its limitations? 3 b) Write the notation for the following orbitals. i) n = 6, I = 2 ii) n = 3, I = 0 iii) n = 4, I = 3c) What are quantum numbers? Give all the four quantum numbers of 15th electron of the 2 atom with atomic number 19. 5 a) Discuss briefly the valence bond theory of covalent bond b) Explain the term hybridization. Discuss the structure, shape and bond angle of the following molecules: BO_3^{3-} , NH_4^+ , SF_4 . 2 What is enthalpy? How is related to internal energy of a system? 3. a) What do you understand by the order of reaction? Derive an expression for the rate 5 constant for second order reaction. b) Prove that half-life period of a second order reaction is inversely proportional to the 3 initial concentration of the reactants. A first order reaction is 15% complete in 20 minutes. How long will it take to be 60% 2 complete? Detail the chemistry of electronic spectroscopy. Give the various types of transitions 5 involved in this technique with one example in each case. b) Define Infra-Red spectroscopy. Describe the various molecular vibrations in the 3 2 Bring out the differences between VBT and MOT. What do you mean by coordination compounds? Discuss the nomenclature of 5 complex compounds by IUPAC system. b) Write down the names of the following complex species according to IUPAC system 3 nomenclature: i) $[Al(OH)(H_2O)_5]^{2+}$ ii) $[Cu(NH_3)_4]SO_4$ iii) $[Fe(H_2O)_6Cl_3]$ c) Discuss the steady state approximation of a consecutive reaction. 2

6.	a)	Define term 'Solubility' and 'Solubility product'.	3
	b)	Discuss the factors which influence the solubility.	4
	c)	What are the differences between dark and photochemical reactions?	3
7.		Write short notes on any THREE of the followings:	10
		 a) Periodic table b) Amino acids c) Ionic bond d) Valence bond theory of covalent bond e) Electrochemical cells 	