Department of Computer Science and Engineering
Begum Rokeya University, Rangpur.
4th Year 1st Semester Final Examination, 2013.

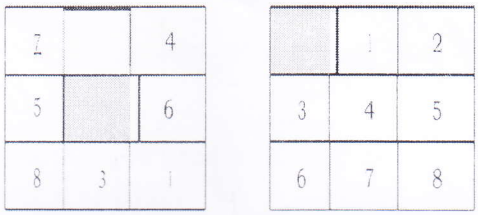
Session - 2009-10

Course Title: Artificial Intelligence
Course Code: CSE4101 **Full Marks: 50**

Answer Any Five from the Given Questions

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

1. **(a)** Define in your own word: i) Artificial Intelligence ii) Agent — 2
   (b) Explain Alan Turing Test Approach for Artificial Intelligence. — 4
   (c) Briefly discuss the applications of AI. — 4
2. **(a)** What is a rational agent? — 2
   (b) Discuss different kind of task environment. — 4
   (c) What is heuristic search? Explain with example. — 4
3. **(a)** Explain the Hill-climbing search. — 2
   (b) The 8-puzzle, an instance of which is shown in the following figure consists of a 3x3 board with eight numbered tiles and a blank space. A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state, such as the one shown on the right of the figure. Write a standard formulation of the problem. — 4

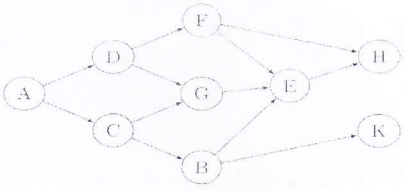


Start State Goal State

   (c) Having formulated the problem in the previous question 3b, describe a solution strategy to solve the problem using minimum number of slide moves. Illustrate your answer when necessary. — 4
4. **(a)** What are the motivations behind the development of Artificial Neural Networks (ANNs)? — 2
   (b) Explain 'the artificial computational model' of biological neuron. — 4
   (c) What is learning rule? Write the differences between unsupervised and supervised learning. — 4
5. Write short notes on : — 10

   i) Genetic algorithm ii) Expert System iii) Natural Language Processing (NLP) iv) Lisp

6. **(a)** Define: fuzzy logic and fuzzy sets. — 2
   (b) Explain the structure of prolog program. — 4
   (c) What is clustering? Briefly explain the K-mean clustering algorithm. — 4
7. **(a)** Briefly explain knowledge representation and knowledge acquisition. — 2
   (b) What is block world problem? Give suitable example. — 4
   (c) Give 2 possible DFS (Depth First Search) traversals of the graph below, listing the nodes in the order they are discovered. *A* should be the starting vertex. — 4



Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

B.Sc. (Engg.) 4th Year 1st Semester Final Examination – 2013 (Session: 2009-10)

Course Code: **CSE 4103** Course Title: **Compiler Design**

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

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

1. (a) What is a compiler? Show the phases of a language processing system and mention the role of compiler in such a system. **1+3=4**

(b) What are the differences between a compiler and an interpreter? Discuss hybrid compilation with example. **2+1=3**

(c) What are the characteristics of a high-level programming language What do you mean by *syntax* and *semantics* of a language? **2+1=3**

2. (a) Define: Token, Pattern and Lexemes. For the following C code fragment, give the *tokens* and their associated *patterns* and *lexemes* generated by a lexical analyzer. **3+3=6**

```
switch(a){ case 1: printf("%d", a); break; } // end of switch
```

(b) What do you mean by *attribute* of *token*? Why is it required? Explain with an example. **2**

(c) With the help of an example, explain why lexical analyzer cannot report any source-code error? **2**

3. (a) What is *double-buffering* technique used in lexical analyzer? How does it impact the performance of the lexical analyzer? **1+2=3**

(b) What benefits are there to use CFG for describing the syntax of a language? **2**

(c) What do you mean by the language of a grammar? Prove that the grammar $S \rightarrow (S)S \mid \varepsilon$ generates all and only the strings of balanced parentheses. **1+4=5**

4. (a) With the help of an example, show that every grammatical construct that can be described by a regular expression can also be described by a grammar but not vice-versa. **2**

(b) What do you mean by a grammar being *left-recursive* and *left-factored*? **2**

(c) Give a relative comparison between *recursive* and *non-recursive* top-down parsing. **2**

(d) Compute FIRST and FOLLOW for the following grammar: **4**

$S \rightarrow (L) \mid a \qquad L \rightarrow L,S \mid S$

5. (a) Construct a predictive parsing table for the following grammar. From the table show that the grammar is ambiguous. **5+1=6**

$S \rightarrow iEtS \mid iEtSeS \mid a$
$E \rightarrow b$

(b) What do you mean by *synchronizing token*? Which symbols are usually considered to be *synchronizing token* during *panic mode* recovery for predictive parsing. **1+3=4**

6. (a) What do you mean by *bottom-up* parsing? Explain with an example that a reduction step in *bottom-up* parsing is the reverse of a step in derivation. **1+2=3**

(b) What is LR parser? Why LR parser is superior over LL parser? **1+2=3**

(c) What are the different conflicts that may arise during *shift-reduce* parsing? Show that a *shift-reduce* parser will suffer from a *reduce-reduce* conflict for the input ((a, a), a, (a)) with respect to the grammar as mentioned in 4(d). 1+3=4

7. (a) If I is the set of item {[S→L.=R]} then compute GOTO (I, =) with respect to the following grammar S→L=R | R L→*R | **id** R→L 4

(b) Given the grammar- 6

$S \rightarrow SA \mid A$

$A \rightarrow$ **a** | **b**

Construct the SLR parsing table.

Department of Computer Science and Engineering
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4th Year 1st Semester Final Examination, 2013.

Course Title: Project Management 2009-10
Course Code: CSE4105 **Full Marks: 50**

Answer Any Five from the Given Questions

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

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1. **(a)** What are the advantage and disadvantage of using project management? **4**
   (b) Explain the concept of project management maturity model. What purpose does it serve? **2+4**
2. **(a)** Who are the project stakeholders? Briefly describe each. **1+3**
   (b) Describe the structure of a functional organization with figure. **3**
   (c) In organizational context describe the benefits of PMO. **3**
3. **(a)** Share the concept of leadership in project management. **1**
   (b) How the project manager leads in (i) acquiring project resources and (ii) Motivating and Building Teams? **4**
   (c) Define Project Champions. What are the characteristics one should posses to be a project champion? **1+4**
4. **(a)** What are the basic steps in assembling a project team? Show with a flowchart. **3**
   (b) Identify the characteristics of effective project team. Give the reasons for failing a project team **3**
   (c) Define virtual project team. How can you make it a effective team? **1+3**
5. **(a)** How can you identify risk? Give a brief description to each. **5**
   (b) Discuss various risk mitigation strategies. **5**
6. **(a)** As a project manager would you accept the cost adjustments associated with the learning curves affect or not? Under what circumstances would learning curve cost be appropriately budgeted into a project? **3**
   (b) What are the most common sources of project cost? **3**
   (c) Assume you are a project cost engineer calculating the cost of a repetitive activity for your project. There are a total of 20 iterations of this activity required for the project. The project activity takes 1.25 hours at its steady rate and learning rate is 90%. Calculate the initial output time for the first unit produced. **4**
7. **(a)** Describe the rules for developing an activity network. **3**
   (b) Construct an activity network using following information for network construction and also identify the critical path: **5**

Name: Project Delta			
Activity	**Description**	**Predecessors**	**Estimated Duration**
A	Contract signing	None	5
B	Questionnaire Design	A	5
C	Target market ID	A	6
D	Survey sample	B, C	13
E	Develop presentation	B	6
F	Analyze result	D	4
G	Demographic analysis	C	9
H	Presentation to client	E, F, G	2

   (c) What is the role of Gantt chart in network construction? **2**

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4th Year 1st Semester Final Examination, 2013.

Course Title: Computer Graphics and Multimedia (2009-10)
Course Code: CSE4106 **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 the importance of learning Computer graphics? In which areas your learning of computer graphics can be implemented?	1+2=3
	(b)	Categorize raster devices. Hence define emissive and non-emissive display with example.	2+1=3
	(c)	What is the role of frame buffer in raster scan display?	1
	(d)	Define: Image Rendering, Scan Conversion of Image and Image Transformation.	3
2.	(a)	You are given two end points (20, 10) and (30, 18) of a straight line with slope $\|m\|<1$. Determine the successive pixel positions along with the line path using Bresenham's line drawing algorithm.	3
	(b)	Describe the Mid-point circle generating algorithm with figure.	3
	(c)	Initialize the global edge table and active edge table in scan line polygon filling algorithm. Hence, give a definition to active edge and global edge.	3+1
3.	(a)	Determine the rotation matrix of a point.	3
	(b)	Perform a 45° rotation of a triangle *A (0, 0), B (1, 1) C (5, 2)* (a) about the origin and (b) about p(-1, -1).	5
	(c)	Considering the homogeneous coordinate determine the translation matrix for composite transformation.	2
4.	(a)	Write down the concepts of food filling and boundary filling with figure.	2
	(b)	Define Shear transformation. Determine the matrix for x-directional shear and y-directional shear.	1+2
	(c)	Describe the Cohen-Sutherland line clipping algorithm with example.	5
5	(a)	Define: window and viewport, world coordinate and normalize device coordinate.	3
	(b)	Find the normalization transformation that maps a window whose lower left corner is at (1,1) and upper right corner is at (3, 5) onto (a) a viewport that is the entire normalized device screen and (b) a viewport that has lower left corner at (0, 0) and upper right corner at (½, ½).	5
	(c)	Describe the principle of graphics plotting in laser light show.	2
6.	(a)	Construct the TAXONOMY of projection.	1
	(b)	What are the differences between orthographic and oblique projection?	2
	(c)	With figure describe the conditions and rules for two point perspective projection.	4
	(d)	Define Horizon line, Picture plane and vanishing point with proper diagram.	3
7.	(a)	Define multimedia.	1
	(b)	Describe run length encoding for image compression.	2
	(c)	What is the role of Pulse code modulation and Quantization in digitizing an audio file?	2
	(d)	What are the compression techniques carried out in coding real time video?	2
	(e)	Differentiae: (i) .JPEG vs .GIF image file type (ii) .AAC vs .MP3 audio file type	3

Department of Compute Science and Engineering
Begum Rokeya University, Rangpur
4th Year 1st Semester Final Examination, 2013 (Session: 2009-2010)

Course Title: Wireles Networks **Full Marks: 50**
Course Code: CSE4108 **Time: 3 Hours**

Answer Any FIVE From the Given Questions

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

1.	(a)	Define Roamer. What is the difference between Roamer and Handoff?	2
	(b)	What is Channnel? How many channels are used in cellular system?	2
	(c)	Why do paging systems need to provide low data rates? How does low data rate lead to better coverage?	2
	(d)	What is frequency reuse? Why it is introduced in cellular communication system?	3
	(e)	What is radio spectrum?	1
2.	(a)	Illustrate the method of locating co-channel cells in a cellular system.	3
	(b)	If a total of 33 MHz of bandwidth is alocated to a particular FDD cellular telephone system which uses two 25kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell is a system uses a) Four cell reuse, b)seven cell reuse, and c) 12-cello reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell of each of the three systems.	6
	(c)	What do you mean by cell dragging?	
3.	(a)	What is *hand-off* in cellular network? Differentiate between *soft hand-off* and *hard hand-off* strategies?	3
	(b)	Prove that for a hexagonal geometry , the co-channel reuse ratio is given by $Q = \sqrt{3N}$ where $N = i^2 + ij + j^2$.	2
	(c)	Describe adjacent channel and co channel interference.	3
	(d)	Why CDMA is better than GSM?	2
4.	(a)	What is cell splitting? Describe how does cell sectoring increase the system capacity?	3
	(b)	Write definitions of six common terms used in trunking theory.	3
	(c)	How does microcell Zone increase the cellular capacity?	2
	(d)	Define Trunking and Grade of Service.	2
5.	(a)	Derive the received power equation in free space propagation model.	3
	(b)	Find the far field distance for an antenna with maximum dimension of 1m and operating frequency of 900MHz.	1
	(c)	Define three baic propagation mechanisms.	3
	(d)	Define Brewster Angle. Calculate the Brewster angle for for a wave impinging on groud having a permittitivity of $\epsilon_r = 4$.	3
6.	(a)	Briefly describe Okumara model.	3
	(b)	What is small scale fading? Describe all factors which are influencing small scale fading.	3
	(c)	Consider a transmitter which radiates a sinusoidal carrier frequencyof 1850 MHz. For a vehicle moving 60mph, compute the received carrier frequencyif the mobile is moving a) directly toward the transmitterm, b) directly away from the transmitter, and c) in a direction which is perpendicular to the direction of arrival of the transmitted signal.	3
	(d)	Define Doppler shift.	1
7.		Write short notes: i) CDMA ii)GSM iii) OFDM iv) MAHO	10

Department of Computer Science & Engineering

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B.Sc. (Eng.) 4th Year 1st Semester Final Examination – 2013 (Session: 2009-10)

Course Code: **SOC2223** Course Title: **Sociology**

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

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

1. How will you define sociology? Will you consider sociology as a science? Justify your position in this regard. **10**

2. Discuss the major types of social regards. **10**

3. Discuss the classification of social groups. **10**

4. Define social disorganization. Discuss the causes and effects of social disorganization. **10**

5. Discuss the recent trends of urbanization with regard to Bangladesh. **10**

6. Distinguish between class and cast. Discuss Marxian analysis of class. **10**

7. What is scientific method? Differentiate between 'Qualitative' and 'Quantitative' research method. **10**

Department of Computer Science & Engineering

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B.Sc. (Engg.) 4th Year 1st Semester Final Examination – 2013 (Session: 2009-10)

Course Code: **GEN3221** Course Title: **Bangladesh Studies**

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

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

1. What is partition of Bengal? Discuss the causes and effect of partition Bengal in 1905. **10**

2. Discuss six points program. Why six points program is called the charter of survival in Bengali people. **10**

3. What do you mean by Language Movement? Examine the importance of the Language Movement in the growth of Bengali nationalism. **10**

4. Define Local Government. Distinguish between Local Government and Local self Government. **10**

5. What do you understand by women's empowerment? Discuss the main issues of women's empowerment in Bangladesh. **10**

6. What ~~are~~ were the spirits of the war of liberation of Bangladesh? Do you think that those spirits have been achieved? Discuss. **10**

7. What is political culture? Analyze the nature of political culture of Bangladesh **10**