

Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

4th Year 1st Semester Final Examination – 2017

Course Title: Artificial Intelligence

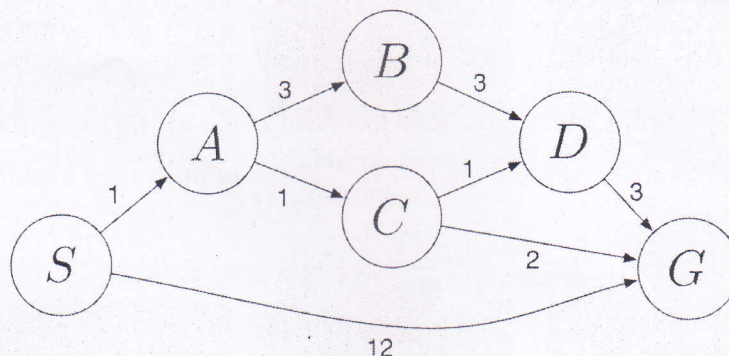
Course Code: CSE4201

Total Marks: 50

Exam Duration: 3 Hours

Answer any of the five questions

1. a. Differentiate Natural & Artificial Intelligence. Explain types of problems which requires AI techniques to be solved. 1+3
 - b. Describe three main AI techniques that an AI solution need to adapt. 3
 - c. Write an algorithm that can be used for game Tic-Tac-Toe. 3
 2. a. Consider, you are given two jugs, a 4-gallon one and a 3-gallon one. Neither has measuring marks on it. There is a pump that can be used to fill the jugs with water. 8
- Write production rules, and solve the above problem by justifying that an AI problem is a State-Space-Search problem.
- b. If more than one production rules are found in searching for a solution of a problem, what are the two main things you should consider in choosing a rule, briefly describe. 2
 3. a. What is combinatorial explosion in search? How heuristic search deals with a combinatorial explosive search problem? 2+2
 - b. Write algorithm for “Steepest-Ascent Hill Climbing” problem? Why “Steepest-Ascent Hill Climbing” algorithm may fail in
 - i. A local maximum
 - ii. A plateau
 - iii. ridge6
 4. a. Differentiate between Breadth-First-Search and Depth-First Search. 2
 - b. Consider the following map. 2+2



- i. What path would breadth-first graph search return for this search problem?
- ii. What path would depth-first graph search return for this search problem?
- c. Explain A* algorithm. 4
5. a. What is Natural Language Understanding? How it differs from Natural Language Processing? 1+1

- c. Distinguish between Syntactic Analysis and Semantic Analysis. 2
- d. What is parser? Consider a sentence "Bill printed the file", show its parse tree. 1+2
- 6. a. Explain the procedure to develop an Expert System. 4
- b. Write an algorithm for DECISION-TREE-LEARNING. Explain your algorithm with an example. 6
- 7. a. What is neural network? Describe how a Feed-Forward neural network works. 1+5
- b. Why do we use convolution in a CNN-based neural network? 2
- c. Differentiate between RNN and LSTM network. 2

2013-14

Department of Computer Science and Engineering
Begum Rokeya University, Rangpur
4th Year 2nd Semester B.Sc. (Engg.) Examination-2018

Course No. : CSE 4203

Course Title: Web Engineering

Full Marks: 50

Time: 03 hours

[Answer any FIVE questions from the followings. The figures in the right margin indicate full marks]

- | | Marks |
|--|---------|
| 1. a) What do you mean by web engineering? What are the applications of web engineering? | 3 |
| b) What does a Web Designer do? What are the main differences/similarities between Web Designer and Web Programmer? | 2+2=4 |
| c) Discuss different techniques of collecting visitor data in the web site. | 3 |
| 2. a) What are the security threats that can affects a company's client-server environment? | 5 |
| b) Describe the basic components of Web architectures and relationships among the components. | 5 |
| 3. a) What are the objectives of presentation modeling? Describe the concept of customization modeling? | 5 |
| b) What do you understand by 'business model'? Discuss different E-commerce business model. | 5 |
| 4. a) What criteria should be considered while choosing ISP? | 3 |
| b) Briefly discuss various web security protocols. | 4 |
| c) Discuss legal issues that should be considered while choosing domain name. | 3 |
| 5) a) Why should you seek professional help to create maximum traffic for your website? | 3 |
| b) Discuss the proven formula by which you can create maximum traffic for your website. | 5 |
| c) List the criteria that can be used in evaluating a website. | 2 |
| 6. a) What does it mean by ASP.Net life cycle? Briefly discuss application life cycle and page life cycle of ASP.NET. Identify their similarities and differences. | 5 |
| b) What is ADO.NET? Describe the data binding process of ADO.NET. | 5 |
| 7. a) What is E-Commerce? How recommender systems help in e-Commerce? Discuss an use-case of recommender system. | 1+2+3=6 |
| b) What is transaction processing? Describe the steps of transaction processing briefly. | 4 |

Department of Computer Science and Engineering
Begum Rokeya University, Rangpur
B.Sc. (Engg.) 4th year 2nd Semester Final Examination-2018

2013-14

Course Code: CSE 4205

Course Title: **Digital Image Processing**

Time: 3.00 hours

Total Marks: 50

[N B: Answer any five (5) questions and figures in the right margin indicate full marks]

1.
 - a) Write down the difference between image enhancement and image restoration. 2
 - b) Briefly discuss the components of an image processing system. 4
 - c) Explain the procedure of digital image acquisition process. 4
2.
 - a) Note down the necessary conditions for *m-adjacency* of two pixels. 2
 - b) Find the 8-path and m-path in the following arrangement of pixels. Why ambiguity is arisen in 8-adjacency and how ambiguity can be resolved. 4

0	1	1
0	1	0
0	0	1
- c) Define Intensity transformation. Explain image negatives in brief and explain why it is necessary. 4
3.
 - a) Explain bit-plane slicing in brief. 3
 - b) What is histogram? Let a 3-bit image ($L=8$) of size 64×64 has the intensity distributions given in following table. Draw a histogram from given table then perform histogram equalization and finally draw equalized histogram. 7

r_k	n_k
r_0	790
r_1	1024
r_2	860
r_3	660
r_4	325
r_5	245
r_6	120
r_7	72
4.
 - a) Define averaging filters. What are the disadvantages of averaging filter? 2
 - b) Describe unsharp masking and high boost filtering with example. 5
 - c) Explain how the gradient is used in image sharpening? 3
5.
 - a) What is need of image transform? Define DFT. 2+2=4
 - b) Explain the following two properties of 2D-DFT: (i) Convolution; (ii) Correlation. 6
6.
 - a) Discuss various methods to estimate the degradation function for image restoration. 5
 - b) Describe Rayleigh noise, gamma noise and impulse noise with PDF. 5
7.
 - a) Why order statistic filters are called nonlinear filter. 2
 - b) Explain median filter and midpoint filter. 3
 - c) Define data compression. Describe different types of data redundancies. 5

2013-14

Department of Computer Science and Engineering
 Begum Rokeya University, Rangpur
 B.Sc. (Engg.) 4th year 2nd Semester Final Examination-2018

Course Code: CSE 4205

Time: 3.00 hours

Course Title: Digital Image Processing

Total Marks: 50

[N.B: Answer any five (5) questions and figures in the right margin indicate full marks]

1. a) Write down the difference between image enhancement and image restoration. 2
- b) Briefly discuss the components of an image processing system. 4
- c) Explain the procedure of digital image acquisition process. 4
2. a) Note down the necessary conditions for m -adjacency of two pixels. 2
- b) Find the 8-path and m -path in the following arrangement of pixels. Why ambiguity is arisen in 8-adjacency and how ambiguity can be resolved. 4

0	1
0	1
0	0

- c) Define Intensity transformation. Explain image negatives in brief and explain why it is necessary. 4
3. a) Explain bit-plane slicing in brief. 3
- b) What is histogram? Let a 3-bit image ($L=8$) of size 64×64 has the intensity distributions given in following table. Draw a histogram from given table then perform histogram equalization and finally draw equalized histogram. 7

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4. a) Define averaging filters. What are the disadvantages of averaging filter? 2
- b) Describe unsharp masking and high boost filtering with example. 5
- c) Explain how the gradient is used in image sharpening? 3
5. a) What is need of image transform? Define DFT. 2+2
- b) Explain the following two properties of 2D-DFT: (i) Convolution; (ii) Correlation. =4
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6. a) Discuss various methods to estimate the degradation function for image restoration. 5
- b) Describe Rayleigh noise, gamma noise and impulse noise with PDF. 5
7. a) Why order statistic filters are called nonlinear filter. 2
- b) Explain median filter and midpoint filter. 3
- c) Define data compression. Describe different types of data redundancies. 5

5

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Begum Rokeya University, Rangpur.

Department of Computer Science and Engineering

(B.Sc. Engg.) 4th Year 2nd Semester Final Examination, 2017. (Session:2013-14)

Course Title: **Machine Learning**; Course Code: **CSE 4221**

Full Marks: 50

Time:3.00 Hours

Answer Any Five from the Given Questions

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

1. (a) Define Machine Learning. Discuss with examples some useful applications of machine learning. 4
- (b) Describe in detail all the steps involved in designing a learning system. 3
- (c) Differentiate among **supervised**, **unsupervised** and **reinforcement** learning. 3
2. (a) Discuss the necessity of dimensionality reduction in machine learning. 3
- (b) Briefly Explain the procedure for the computation of principal components of a given dataset. 4
- (c) Distinguish between **overfitting** and **underfitting**. How it can affect model generalization? 3
3. (a) Describe Maximum Likelihood Hypothesis (**MLE**) for predicting probabilities. 4
- (b) Explain linear regression for multivariate data. 3
- (c) Explain (i) Hypothesis space (ii) Version space. 3
4. (a) Explain Confusion Matrix with respect to detection of "**Spam e-mails**" 4
- (b) Define expected value, variance, standard deviation and estimate bias of a random variable. 3
- (c) Explain Bootstrapping method for evaluating accuracy of a classifier. 3
5. (a) What is concept learning? 1
- (b) Illustrate Find S Algorithm over *EnjoySport* concept. Training instances given below: 6

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

- (c) How is Candidate Elimination algorithm different from Find-S Algorithm? 3
6. (a) Explain Bayes theorem. Hence, define: prior probability and posterior probability. 3
- (b) Consider a medical diagnosis problem in which there are two alternative hypotheses: 1. That the patient has a particular form of cancer (+) and 2. That the patient does not (-). A patient takes a lab test and the result comes back positive. The test returns a correct positive result in only 98% of the cases in which the disease is actually present, and a correct negative result in only 97% of the cases in which the disease is not present. Furthermore, .008 of the entire population have this cancer. Determine whether the patient has Cancer or not using MAP hypothesis. 7
7. (a) What is Artificial Neural Network? Explain appropriate problem for Neural Network Learning with its characteristics. 3
- (b) Define perceptron. Explain the concept of perceptron with neat diagram 4
- (c) Explain how to learn Multilayer Networks using Gradient Descent Algorithm. 3