International Islamic University Chittagong
Center for General Education (CGED)
Midterm Examination, Spring - 2022

Course Code: **URBS – 4802**
Course Title: **Bangladesh Studies and History of Independence**

Full Marks: 30 Time: 1.5 Hours

Answer **any three** of the following questions.
[All questions are of equal value]

1. Sketch out the river system of Bangladesh and analyze its impact on the society. How can maximize the use of river resources for the sustainable development of the country?

2. Find out the ethnological identity of the people of Bangladesh. How will you explain 'Demographic Dividend' in the challenge of overwhelming population?

3. How was the advent of Islam in Bengal accomplished by the Arab-Persian traders and Sufi preachers? Explain.

4. Explain the comprehensive educational system in Bengal under Muslim rule (1204-1757). Compare its exclusive characteristics with the existing educational system of Bangladesh.

5. Write short notes on **any two** of the following topics:
   m) Maritime Boundary of Bangladesh
   n) Enclave Exchange between Bangladesh and India
   o) Physiographic Units of Bangladesh
   p) Composition of Muslim society in Bengal.

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. Engineering in CSE

Midterm Examination, Spring 2022

Course Code: **MGT-3601** Course Title: **Industrial Management**

Time: 1 hour 30 minutes Full Marks: 30

(i) Answer all the questions. The figures in the right hand margin indicate full marks.

(ii) Course Outcomes (COs) and Bloom's Levels are mentioned in the following Columns.

Course Outcomes (COs) of the Questions	
CO1	Explain the theories and principles of modern management and apply the concepts to the management of organizations in private and public sector
CO2	Understand how managers can effectively plan in today's dynamic environment,
CO3	Identify what strategies organizations might use to become more innovative and explain how the industrial company markets and price it's products and also how the company deal with its environment.

Bloom's Levels of the Questions						
Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1)	a)	Describe the kinds of managers by level of management in an organization.	R	CO1	5
1)	b)	Describe the role of education and experience to become an effective manager.		CO2	5
2)	a)	Discuss the nature of the organizational environment. Identify the components of the internal environment and discuss their impact on organizations.	Ap	CO3	5
2)	b)	Identify and describe how the environment affects organizations and how organizations adapt to their environment.	E	CO2	5
3)	a)	In designing job 'Job Characteristics Approach' is the most preferable approach because it considers the five dimensions that match the characters of most competent person seeking a lucrative job. Justify.	E	CO1	5
3)	b)	Consider the following job. In your opinion, what should be the appropriate span of management? Describe the factors you considered in reaching your conclusion. An owner-manager of a wooden furniture factory & showroom deals with customers, directs several experienced mechanics, and also trains and oversees the work of some unskilled laborers.	An	CO3	5
		OR			
3)	a)	Discuss some factors that influence the appropriate degree of decentralization.	E	CO1	5
3)	b)	Identify the steps in the delegation process? Explain the three kinds of interdependence that necessitate coordination?	An	CO3	5

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE, Mid Term Exam, Spring 2022

Course Code: **CSE-4805** Course Title: **Social, Professional, Ethical Issues in Computing**

Time: 1 hour and 30 minutes Full Marks: 30

(i) Answer all three (3) questions. The figures in the right-hand margin indicate full marks

(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

Course Outcomes (COs) of the Questions	
CO1	Remember, identify, and apply different ethical philosophies, frameworks, and methodologies. The goal is for students to be able to address ethical dilemmas with reasoned arguments, grounded in a combination of these ethical theories.
CO2	Understand and identify and interpret the codes of professional conduct relating to the disciplines of computer science and software engineering such as ACM Code of Ethics. We will also learn how we can use these in our daily practice.
CO3	Apply the concepts and principles of moral thinking to problems relating to computing and digital technologies.
CO4	Analyze the local and global impact of computing on individuals, organizations, and society. Students will be able to discuss key concepts in a digital society including issues of copyright, privacy, personal freedom, computer crimes and new legal issues as well as advances in medicine, telecommunications and education.

Bloom's Levels of the Questions						
Letter Symbols	R	U	App	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1.	a)	What is computing? Discuss some professional issues in computing.	CLO1	R	5
	b)	Write down the differences between ethics and morality. Analyze social impact of computers to today's world.	CLO2	U	5
2.	a)	What does the term personal information mean? Discuss how CCTV and other electronic devices hamper our privacy? What are the remedies?	CLO4	An	5
	b)	A very large social network company analyzes all data it gathers through its service on its members' activities to develop statistical information for marketers and to plan new services. The information is very valuable. Should the company pay its members for its use of their information?	CLO4	An	5
		OR (for 2b only, 2a must answer)			
	b)	Describe two methods a business or agency can use to reduce the risk of unauthorized release of personal information by employees.	CLO4	An	5

3.	a)	What is legality? Suppose, Mr. X is walking in the street. And he found some money dropped in the street, and keep it. Determine his action of behavior in case of legality and ethicality. Justify your answer based on that issue.	CLO4	An	5
	b)	Suppose, Mr. Y got a job opportunity and joined in the job. But, the job isn't permanent based on appointment. Then he got an offer from other corporate job with higher salary. So, Mr. Y left the current job and joined in the corporate job. i. Determine the act of Mr.Y based on teleological theories. Briefly explain it. ii. Determine his action based on legality and ethicality. iii. What are the criticisms for this course of action by Mr. Y?	CLO3	App	5
		OR (for 3b only, 3a must answer)			
	b)	Briefly discuss the key points of ICT act of Bangladesh. Do you have any social responsibility to spread ICT act among general peoples? How do you perform those responsibilities?	CLO3	App	5

International Islamic University Chittagong

Department of Computer Science and Engineering

Midterm, Spring-2022

Course Code: CSE-4877 **Course Title**: Machine Learning and Data Mining

Total marks: 30 Time: ***1.5*** hours

[Answer the following questions. Figures in the right-hand margin indicate full marks.]

			CO
1.a)	Discuss (shortly) whether each of the following activities is a data-mining task or not. i. Extracting the frequencies of a sound wave ii. Predicting the future stock price of a company using historical records iii. Predicting the outcome of a fair coin. iv. Monitoring the heart rate of a patient for abnormalities	2	CO1
	OR		
	What is the outlier analysis? Why is it important?		CO1
b)	When can you say that a machine is learning? Categorize the popular machine learning algorithms and give examples of each category.	3	CO1
c)	Consider the following data table containing Term-Frequency Vector:	5	CO3

Document	*team*	*coach*	*hockey*	*baseball*	*soccer*	*penalty*	*score*	*win*	*loss*	*season*
Document1	5	0	3	0	2	0	0	2	0	0
Document2	3	0	2	0	1	1	0	1	0	1
Document3	0	7	0	2	1	0	0	3	0	0
Document4	0	1	0	0	1	2	2	0	3	0

Find the most similar and most dissimilar documents among the above four documents.

2.a)	Consider the following data table containing variables of mixed type. Show the dissimilarity matrix between the variables.	6	CO3

Object Identifier	Test-1 (nominal)	Test-3 (numeric)	Test-4 (binary)
1	code-A	440	1
2	code-B	220	0
3	code-A	121	1

b)	Compare the following data types with examples a) Symmetric Binary and Asymmetric Binary b) Interval-scaled Numeric and Ratio-scaled Numeric c) Nominal and Ordinal	4	CO2
3.a)	What is regression analysis? Why it is used?	3	CO1
b)	What is data normalization? Compare any two normalization techniques with a relevant small dataset.	4	CO2
	OR		
	What are the reasons for missing data? Compare any two missing value imputation techniques using a relevant small dataset.		CO2
c)	Consider the following data 2, 3, 4, 8, 15, 9, 21, 21, 35, 25, 26, 28, 29, 34, 34 and three bins. Partition the data using equal-frequency bins and smooth-by-bin means.	3	CO3

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE, Midterm Exam, 8th Semester, Spring 2022

Course Code: CSE 4845 **Course Title: Distributed Database**

Total marks: 30 Time: 1 hours 30 minutes

[Answer all the questions; in some questions, there are options;
Figures in the right-hand margin indicate full marks.]

1. a. Write down the Peer-to-Peer Architecture for DDBMS according to Data-based approach. 5

   b. What are the characteristics of distributed database management system? Write down the functional goals of distributed database management system? 5

   OR

   What do you know about the ANSI/SPARC Architecture of DBMS? Describe it.

2. a. What is Replication and Allocation? What is a reasonable unit of distribution? Relation or fragment of relation? Explain it. 5

   b. 5

   What are the design problems of distributed systems? What is Fragment Allocation? How can we define the Horizontal and Vertical fragmentation?

   OR

   Write down the steps of View Integration for a Unique Database? Discuss about the different types of Conflict analysis.

3. ***MediaWiki*** and ***TikiWiki*** are two wiki like content management systems with a DB backend. At the International Islamic University Chittagong some of the professors use ***MediaWiki*** while some other use ***TikiWiki***. The university wants to allow the professor using one of the two systems to access the pages of the other one, while keeping unaltered the original applications. We report the two original relational schemas:- 10

   MEDIAWIKI-DB

   PAGE (pid, title, namespace)

   REVISION (rid, page, text-id)

   TEXT(tid, plain-text)

   USER (uid, nickname, password)

   PAGELINKS (from, title, namespace)

   where *PAGE* contains the metadata about a page, *REVISION* contains different versions of the same page, *TEXT* contains individual text of each revision. USER contains the information about CMS users and *PAGELINKS* stores the

links between pages as an id of the source page and the title and namespace of the target page.

TIKIWIKI-DB

PAGES (**page-id**, version, page-title, text)

COMMENTS (**page-id, user-id**, comment)

USER (**user-id**, real-name, username, email, pwd, path-to-picture)

LINKS (**from-page, to-page**)

PAGES contains the information about pages (their versions and the actual texts), *COMMENTS* stores user comments to pages, *USER* contains information about users, *LINKS* represents the links between pages as id pairs of the source page and of the target page.

You are required to:-

- Propose a **data-integration solution based** on the requirements above.
- provide, for each input data source, the reverse engineering from the **logical** to **conceptual schema.**

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE Midterm Examination, Spring 2022

Course Code: CSE 4871

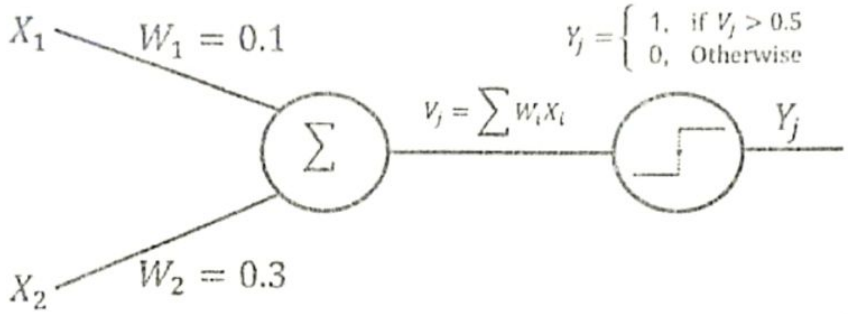
Course Title: Neural Network and Fuzzy System

Total marks: 30

Time: 1 hour 30 minutes

[Answer any three (3) questions from the following. Figures in the right-hand margin indicate full marks.]

			CO
1.			
a)	How does a neural network differ from a conventional computer?	2	CO1
b)	Enumerate the benefits and limitations of neural networks.	3	CO1
c)	Consider the following neural network model with a learning rate of 0.2.	5	CO2



Demonstrate the learning process of the AND operation as shown below using the delta rule backpropagation.

	Input		Desired Output
Case	X_1	X_2	Z
1	0	0	0
2	0	1	0
3	1	0	0
4	1	1	1

2.			
a)	Do you think the performance of the neural networks depends on the dropout? If yes, explain your thoughts.	1.5	CO1
b)	Taking a sample RGB image, briefly explain with necessary figures about the working procedure of CNN.	5	CO2
c)	Why do we use the softmax function at the end of the neural network model? Given the score -2, 1, 4, and 7, estimate the probability of these scores using the softmax function.	2	CO2
d)	Why ReLU is popular compared to the other activation function?	1.5	CO1

3.		5	CO2
a)	Consider a convolutional neural network (CNN) example as shown below, where the input layer's shape is (32, 32, 3). Calculate the activation size and number of parameters of each layer. A brief explanation about your computation is required along with the necessary formula.		

	Activation Shape	Activation Size	Number of Parameters
Input	(32, 32, 3)		
CONV1 (f=3, s=1)	(28, 28, 8)		
POOL1	(14, 14, 8)		
CONV2 (f=3, s=1)	(10, 10, 16)		
POOL2	(5, 5, 16)		
FC3	(80, 1)		
FC4	(42, 1)		
Softmax	(10, 1)		

Here, Input denotes the input layer, CONV denotes the convolutional layer, f denotes the filter size, s denotes the stride, POOL denotes the pooling layer, FC denotes the fully connected layer, and Softmax denotes the softmax layer.

	Or,		
a)	How is the Error calculated in a Linear Regression model? Explain with an example.	5	CO2

b)	Consider two classification systems named as System#A and System#B. The predictions of these two systems against the 10 test documents along with their ground truth are given in the below table.	5	CO1

Test Doc.	True Label Or Ground Truth	Predicted Label (System#A)	Predicted Label (System#B)
Doc1	1	1	0
Doc2	0	1	0
Doc3	1	1	1
Doc4	1	0	1
Doc5	1	1	1
Doc6	0	0	0
Doc7	0	1	0
Doc8	1	0	1
Doc9	0	0	0
Doc10	1	1	0

Now, answer the following questions:

a) Determine the confusion matrix for System#A and System#B.
b) Estimate the recall, precision, F1-Score, and accuracy of each system.
c) Based on the evaluation scores, write your opinion about their performances.

	Or,		
b)	How does a Non-Linear regression analysis differ from Linear regression analysis? Name and explain some Evaluation Metrics for Regression Model and when you would use one?	2+3	CO1

International Islamic University Chittagong

Dept. of Computer Science & Engineering (CSE)

B.Sc. in CSE, Semester Mid-Term Examination, Spring 2022

Course Code: CSE 4875 Title: Pattern Recognition and image processing

Total Marks: 30 Time: 1.5 hours

			CO	DL
1(a).	"One picture is worth more than ten thousand words" – Explain the fields of image processing used in the statement.	2	CO1	C2
1(b)	Why convolution/mask operation and correlation is used in the image processing? Explain the answer with proper example.	2	CO1	C2
1(c)	The continuum from image processing to computer vision can be broken up into low-, mid- and high-level processes. Explain why we need to process images in low, mid and high level processing with proper example.	3	CO1	C2
1 (d)	"A digital image is a representation of a two-dimensional image as a finite set of digital values" – do you agree with the statement? Explain the answer with mathematical formula.	3	CO1	C2
2(a)	Justify the statement, "Applying Low-pass filter on an image result in a blurrier image".	2	CO1	C2
2(b)	A 5x5 bits/pixel original image is given by (4 bits/pixel)	5	CO2	C3

15	12	8	9	14
12	12	12	14	11
13	13	10	9	10
15	12	10	12	11
13	14	13	13	14

i. Apply histogram equalization to the image by rounding the resulting image pixels to integer.

ii. Sketch the histograms of the original image and the histogram-equalized image.

iii. Why histogram equalization not produce a perfectly flat histogram?

Or,

Find the optimal threshold of the following image using Otsu method.

0	1	4	0
0	2	1	2
2	1	4	4
0	2	3	1

A 4 x4 original image is given with 3 bits/pixel. 3. CO2

2	3	3	1
0	7	1	2
	6	5	
0	2	4	1

i. Perform Median filtering of the above image. (Use padding if necessary)

ii. "Performance of Median filtering is better than Averaging filtering" - Explain

When automatic enhancement is desired, equalization is a good approach. Explain with example in which approach Histogram specification performs better. Justify your answer with the image provided in 2(b). 2 CO2 C3

Write a short note with your own word to explain how do human beings perceive color? Given a color image represented in terms of RGB components, how are the corresponding CMY and HIS coordinates derived? 3 CO1 C2

A 4 x4 original image is given with 3 bits/pixel. 5 CO2 C3

2	3	4	0
1	7	5	2
2	7	6	5
2	1	3	1

i) Perform Prewitt and Sobel operator on the image (Use padding)

ii) Analyze the differences of both images.

Or,

A 4 x4 original image is given with 3 bits/pixel.

1	3	4	0
0	7	4	2
2	6	7	4
1	2	3	1

i) Perform Lowpass and High-pass filter on the image separately (Use padding)

ii) Analyze the statement " Lowpass + Highpass = Original image".