International Islamic University Chittagong
Center for General Education (CGED)
Midterm Examination **Spring Semester- 2023**
Course Code: GEBL-2401
Course Title: Bangla Language and Literature
Full Marks: 30 Time: 1.5 Hours

ক-বিভাগ
ভাষা ও নির্মিতি: ২০

(প্রতিটি প্রশ্নের মান সমান।)

প্রশ্ন নং	বর্ণনা	মান	CLO	Cognitive learning
০১	"ইন্দো-ইউরোপীয় ভাষাগোষ্ঠীর আর্য শাখা থেকে বাংলা ভাষার উদ্ভব" – বাংলা ভাষার উদ্ভব ও বিকাশের ইতিহাস আলোচনায় উক্তিটির সত্যতা নিরূপণ কর।	১০	CLO1	Evaluate
	অথবা,			
	নিচের পরিভাষাগুলোর পরিচয় দাও: ক. মৌলিক স্বরধ্বনি। খ. দ্বিস্বরধ্বনি। গ. ওষ্ঠ্য ধ্বনি। ঘ. স্পর্শ ধ্বনি। ঙ. মহাপ্রাণ ধ্বনি।	৫ × ২=১০	CLO1	Understand
০২.	তোমার বিশ্ববিদ্যালয়ের কেন্দ্রীয় লাইব্রেরি নিয়ে একটি প্রাতিষ্ঠানিক প্রতিবেদন রচনা কর।	১০	CLO1	Create

খ-বিভাগ
সাহিত্য: ১০

প্রশ্ন নং	বর্ণনা	মান	CLO	Cognitive learning
০১	"জীবনে এমন কত বিচ্ছেদ, কত মৃত্যু আছে, ফিরিয়া ফল কী।" –উক্তির আলোকে রবীন্দ্রনাথ ঠাকুরের "পোস্টমাস্টার" গল্পের কেন্দ্রীয় চরিত্র বিশ্লেষণ কর।	১০	CLO2 CLO3	Apply
	অথবা,			
	বিভূতিভূষণ বন্দ্যোপাধ্যায়ের "পুঁইমাচা" গল্প বিশ্লেষণ করে তৎকালীন সমাজে নারীর অবস্থান নিরূপণ কর।	১০	CLO2 CLO3	Analyze

International Islamic University Chittagong

Morality Development Program

Examination: Mid Term | Session: 2023 | Semester: Spring

Course Title: Concept of Moral Development-I | Course Code: MDP-2404

[Other than Shariah Faculty]

Full Marks: 30 | Time: 1 hour 30 minutes

[N.B: Answer any three of the given four (Q1-4) questions]

1. What do you know about moral degradation in Islamic perspectives? Illustrate the fundamental reasons responsible for causing moral degradation. Suggest prospective remedies for the problem. 10

2. State the standard feature of Muslim family. Deduce the major characterization of conflict free Muslim family. Briefly explain the reasons why people addicted in drugs? 10

3. "Suicidal tendency is one major kind of psychological disorder, and it is Islamically totally prohibited."- Justify the statement. Discuss about the role of Islam in the management of this disorder. 10

4. Summarize the Islamic guidelines for healthful living. What is the major role of Islamic lifestyle and healthy nutrition in accordance with the holy Quran and Sunnah? 10

International Islamic University Chittagong
Department of Computer Science and Engineering
B. Sc. Engineering in CSE
Midterm Examination, Spring 2023

Course Code: **ACC 2401** Course Title: **Financial Managerial Accounting**
Time: 1 hour 30 minutes Full Marks: 30
Answer all of the following questions. The figures in the right-hand margin indicate full marks.

1)	a)	Discuss the users of Accounting information? Discuss the Accounting branches that provide particular information to the users.	CO1	Un	4
1)	b)	Write short notes with example: i) Accounting Equation ii) Historical cost principle iii) Going concern assumption iv) Materiality	CO1	Un	6
2)	a)	Mr. Hasan opens a business firm named HASAN ENTERPISE on Jan 01, 2023. He will be the sole owner of the business. During this month the following transactions take place: a. Mr. Hasan sold his personal land for $50000 and invested $40000 in the business. b. He paid $20,000 for a house to be used as an office. c. Purchased office supplies $2,000 on account. e. Paid $3,000 of personal funds for a vacation of his family. f. Performed services and billed the client for services rendered, $15,000. g. Paid office rent $3000. h. Withdrew cash from business for his personal requirements, $2,000. ***Required:*** 1) Journalize the above transactions. 2) Post the transaction into the ledger. 3) Prepare the trial Balance.	CO2	E	10
3)		Mr. Maruf owns and operates a business called Maruf Traders. The following amounts summarize the financial position of her business on August 31, 2022: Assets = Liabilities + O's Equity Cash + A. Rec.+ Supplies + Land = A. Payable + Capital Bal. $1550 7,550 2,000 85,400 16,500 80,000 During September 2022 the following events occurred: a. Maruf inherited $75,000 and deposited the cash in the business bank account. b. Performed services for a client and received cash of $7,000. c. Paid off the beginning balance of accounts payable. d. Purchased supplies on account, $1,500. e. Collected cash from a customer on account, $3,000.	CO2	E	10

		f. Sold his personal car for $5000 and remodeled his personal apartment for $4000 and purchased furniture for the business use for $1000. g. Service provided on account $2,400. h. Recorded the following business expenses for the month: (i) Paid office rent - $900 (ii) Paid advertising - $100. (iii) Salary expense due but not paid $2000. i. Sold supplies to another business for $150 cash, the cost of the supplies was $180. j. Withdrew cash of $3,800 for personal use. k. Collected cash from his friend for buying a personal car $10,000. l. Maruf deposited $15,000 cash to his personal bank account by selling some his personal common stocks. **Required** Analyze the effects of the above transactions on the accounting equation of Maruf Traders.			
		OR			
3)		1) Mr. Tareq invested $50,000 cash in the business. 2) Paid $30,000 cash for Land. 3) Purchased $400 of Office Supplies on account. 4) Received $5,000 cash from clients for accounting service revenue earned. 5) Performed accounting service for a client on account, $3,000. 6) Paid cash expenses: rent, $1,200; Employee salary, $800; utilities, $200. 7) Electricity bill received for $500 but will be paid in the next month. 8) Paid $200 on the account payable created in transaction-3. 9) Remodeled his personal residence by withdrawing $2000 cash from the business. 10) Received $1,500 on the account receivable created in transaction-5. 11) Sold land for cash $22,000 but its cost was $20,000. 12) Withdraw $2,000 cash for personal living expenses. ***Required:*** a) Analyze the effects of the above transactions on the accounting equation. b) Prepare an Income Statement, Owners' Equity Statement and a Balance Sheet.	CO2	E	10

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE Midterm Examination, Spring 2023

Course Code: CSE 2421 Course Title: Computer Algorithms

Total marks: 30 *Time: 90 minutes*

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

1.

a) Find the asymptotic upper bound of the following recurrence by using master method: **4**

$T(n) = 3T(n/3) + f(n)$

where **(i)** $f(n) = n^2$ and **(ii)** $f(n) = \lg n$.

b) Find the time complexity of the following function. **3**

```
void Duffy (int n)
{
  for (int i = 1; i*i <= n; i++)
    for (int j = 1; j <= i; j = j*2)
      k = k + 1;
}
```

How the time complexity will be changed if **i*i** is replaced with **i**?

c) Show that the asymptotic lower bound of any polynomial of degree **n** can be expressed as $\Omega(x^n)$. **3**

2.

a) Find the time complexity of the following function? **4**

```
Raise (x, n)
  if x = 0
    return 1
  p = floor(n/2)
  if n is odd        return x * Raise(x, p) * Raise(x, p)
  if n is even       return Raise(x, p) * Raise(x, p)
```

Can you specify a way to improve the performance of the function?

b) *Show using recursion tree how the worst case time complexity of quicksort algorithm becomes* $O(n^2)$. **3**

c) Construct a Heap from the following array and show each step. **3**

$A = \langle 5, 9, 3, 14, 7, 12, 11, 8, 4, 10, 6 \rangle$.

OR

Show how you can sort the numbers from the following Heap **A**. Illustrate each step.

$A = \langle 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 \rangle$.

3.

a) Find an optimal parenthesization of a matrix-chain product whose sequence of dimensions is **4**

$\langle 5, 5, 6, 6, 8 \rangle$.

OR

Find a Longest Common Sequence of the following two sequences using dynamic programming and show the steps.

$X = \langle 0, 1, 1, 0, 1, 0, 1 \rangle$

$Y = \langle 1, 0, 0, 0, 1, 1 \rangle$

b) What is optimal substructure? Show that the matrix-chain-multiplication problem has this property. **3**

OR

What is overlapping subproblems? Show that the longest common subsequence problem has this property.

c) Show the operation of the Counting-sort on the following array. **3**

$A = \langle 6, 4, 8, 4, 6, 2, 6, 4, 8, 2, 7 \rangle$

International Islamic University Chittagong

Department of Computer Science and Engineering

Mid-Term Examination, Spring-2023 Semester: 4th

Course Code: CSE-2423 Course Title: **Database Management System**

Time: 1 Hour 30 minutes **Marks:** 30

			Mark	CO	DL
Q1.	**a)**	Define Database management system? What is data Abstraction? Write down the benefits of data abstraction	1+2 =3	CO1	C1
	b)	How does database system ensures atomicity and concurrency? Explain each with example	3	CO1	C2
	c)	Compare between DML and DDL. Write down the functions of different component of storage manager.	2+2 =4	CO1	C1
Q2.	**a)**	How does a query being executed through different components of DBMS? Explain.	3	CO1	C2
	b)	Consider a scenario where a student can register for courses. All student are enrolled to a specific department. Courses are taught by the teacher of the department which a student is enrolled. A teacher can be a course teacher also an advisor at the same time. Now draw a simple E-R diagram from the above scenario. Consider the necessary mapping cardinalities, participation constraints and attributes.	4	CO3	C6
		OR			
	b)	*Construct an ER of the database used by the ABC super store, where persons with ID, name, age considered as either Customer or Employee. Customers may be either wholesale or retail customers. Employees could be either operational or manager. The manager could control the employees to ensure proper sell of the products to the customers. Consider the necessary mapping cardinalities, participation constraints and attributes.*	4	CO3	C6
	c)	What do you understand by attributes? Write down the types of attributes. Explain at least three of them with proper example.	3	CO1	C1
Q3.	**a)**	Write down the fundamental operations of the relational algebra and explain them with proper example.	4	CO1	C2
	b)	passenger (pid, pname, pgender, pcity) flight (fid, fdate, time, src, dest) book (pid, fid) Consider the relational database given above, where the primary keys are underlined. Give an expression in the	3x2 =6	CO2	C3

International Islamic University Chittagong

Department of Computer Science and Engineering

Mid-Term Examination, Spring-2023 Semester: 4th

Course Code: **CSE-2423** Course Title: **Database Management System**

Time: 1 Hour 30 minutes **Marks:** 30

		Mark	CO	DL

relational algebra:

1. Get the details of flights that are scheduled on both dates 01/03/2023 and 03/03/2023 at 18:00 hours.
2. Get the details of flights that are scheduled on either of the dates 05/03/2023 or 07/03/2023 and booked for passenger 'P01'
3. Find the passenger who have booked same flight as 'P02'

OR

b) **Product**(P-id, P-name, Unit_price) **3x2 =6** **CO2** **C3**
Sales(S-id,P-id,C-id, Emp_id, Data_of_Sale, Time, Quantity)
Customer (C-id, C-name, Mobile, Street, City, Country)
Employee(Emp-id, E-name, Designation, Commission, Salary, Mobile, City, Country)

Consider the relational database given above, where the primary keys are underlined. Give an expression in the relational algebra:

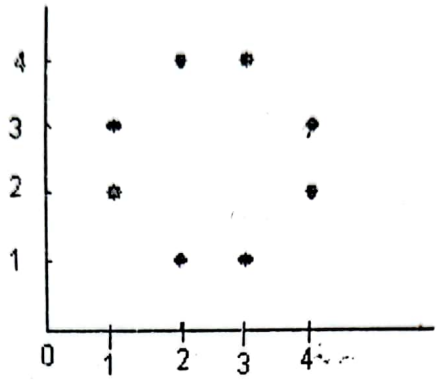
1) Find those Employees and their sales details who have sold more than 5000 on '20-Nov-2017'
2) Find the customers details who have served by employee 'X'
3) Find the customers who have purchased same products as 'Y' before '20-Nov-2017'.

International Islamic University Chittagong
Department of Computer Science & Engineering
B.Sc. in CSE , Mid Term Examination , Spring 2023
Course Title: Mathematics-IV Course Code: MATH-2407 (New)
Course Title: Mathematics-V Course Code: MATH-3501 (Old)

Total Marks: 30 Time: 1.5 hours

Answer all the questions; Figures in the right hand margin indicate full marks

1. a) 04 CLO1



Determine whether the relation is reflexive, symmetric, anti-symmetric and transitive

b) Let the function $f:\Re^{\#} \to \Re^{\#}$ be defined by $f(x)=x^2+2x-4$ Find $f^{-1}(-3)$ 01 CLO1

c) Prove De-Morgan's theorem 02 CLO1

$$(A \cup B)' = A' \cap B'$$

d) Evaluate $\int_C (x^2+jy^2)dz$ from $z=0$ to $z=1+2j$ along the contour C defined by the line from $z=0$ to $z=1+j$ and then the line from $z=1+j$ to $z=1+2j$. 03 CLO2

2. a) A circle in the z-plane has its centre at $z=3$ and a radius of 2 units. Determine its image in the w-plane when transformation by $w=\frac{1}{z}$ Show your analysis with necessary justification. 06 CLO2

Or

State and Prove Demoivres theorem CLO2

b) Prove that $f(z)=|z|^2$ is not harmonic functions but $f(z)=\ln(|z|^2)$ is harmonic. 04 CLO2

3. a) Determine whether $f(z)=z^2+5jz+3-j$ is analytic 03 CLO2

b) Evaluate $\int_c \frac{z^2-z+2}{z-2}dz$ Where c is the circle i) $|z|=2$ ii) $|z|=\frac{1}{3}$ 04 CLO2

Or

Using Demoivres theorem find the quadratic equation whose roots are the nth power of the roots of the equation, $x^2-2x\cos\theta+1=0$ CLO2

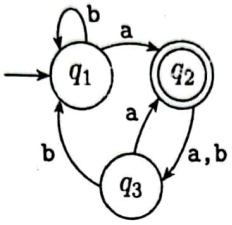
c) Let $f(z)=\frac{2+z+z^2}{(z-2)(z-3)(z-4)(z-5)}$ Show all the poles and compute their residues 02 CLO2

d) Draw the graph for the equation $u^2=-4.5(v-3)$ 01 CLO1

International Islamic University Chittagong
Department of Computer Science and Engineering
B. Sc. in CSE Midterm Examination, Spring 2023
Course Code: CSE 2425 Course Title: Theory of Computing
Total marks: 30 Time: 90 minutes

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

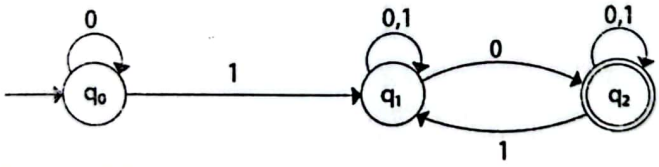
			CO	DL
1.				
a)	Write short note on computability theory.	2	CO1	U
b)	Construct DFA for the following languages where alphabet is {0, 1}.	4	CO1	C
	i. {w| $w$begins with 11 and has even number of 0's}			
	ii. {w| $w$begins with a 1 and every third symbol is a 0}			
	iii. {w| $w$does not contain the substring 1001}			
c)	Write regular expressions for the languages described in 1(b).	4	CO2	C
2.				
a)	Mention two strings accepted by the following FA and two strings that are not.	2	CO1	A



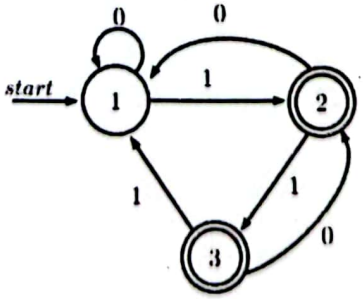
OR

Convert the following regular expression to an NFA: **(00 ∪ 1)*(11)***

b)	What are the languages described by the following regular expressions? Write a one sentence description for each language.	3	CO2	N
	i. **(11 ∪ 00 ∪ 10 ∪ 01)***			
	ii. **(00)*1(11)***			
	iii. **(00 ∪ 1)***			
c)	*Prove that the class of regular languages is closed under union operation.*	5	CO2	N
	OR			
	Prove that the class of regular languages is closed under intersection operation.			
3.				
a)	Convert the following NFA to an equivalent DFA. Give only the portion of the DFA that is reachable from the start state.	5	CO1	A



b)	Convert the following DFA to a regular expression	5	CO1	A



OR

Use the pumping lemma to show that the following language is not regular.

A = {w\| $w$has an equal number of 0s and 1s}