International Islamic University Chittagong

Center for General Education (CGED)

Midterm Assessment Test, Spring–2022

Course Title: Sciences of Qur'an and *Hadith* **Course Code: URED-2302**

(For Law faculty: URED-2101)

Full Marks: 10+20=30 **Time: 0:30+2:30=3:00 Hours**

Group: A: (10 Marks)

Answer MCQ Questions or attend the viva as per the direction of the course instructor.

Group: B: (20 Marks)

Answer any **Four (4)** of the following
(All questions are of equal value):

1. Define Al-Qur'an literally and terminologically proving it is the Speech of Allah (SWT).

2. "The holy Qur'an is the first and main source of Islamic *Shari'ah*"- justify properly.

3. "The procedures of the revelation of *Whai* to Prophet (SAAS) are different"- evaluate this statement explaining some important classifications of *Wahi*.

4. "The holy Qur'an was revealed gradually"- establish the statement mentioning the wisdom behind the gradual revelation.

5. How were the verses and chapters of the holy Qur'an arranged? Explain properly.

Note:

- The PDF file of the answer sheet must be submitted within three hours from starting the examination through Google Classroom.
- Each examinee has to answer a few MCQ questions or participate in the Viva Voce as per the instructions of the Course teacher.
- 2:30 hours for the written examination, 30 minutes for uploading and submitting the documents. Total: 3 hours. Extra 30 minutes may be given for MCQ questions.

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Set: Alpha

International Islamic University Chittagong

Department of Computer Science & Engineering

Mid Term Examination, Spring 2022

CSE 2321 Data Structures

Total marks: ***21***

Time: 2 hours 30 minutes for exam + 30 minutes for submission

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

1. a)	A library maintains a book list containing the following data for each book: Name of Authors, Title of Book, Edition, Publisher's Name, Year, ISBN i) State the *entities, attributes* and *entity set* of the list. ii) Which attribute can serve as the *primary key* for the list?	1	CO1	C2
b)	Draw a *flowchart* for *linear search* algorithm [if last digit of your ID is odd] / *binary search* algorithm [if last digit of your ID is even].	2	CO1	C2
c)	What is the *time complexity* of the following functions? Explain.	2	CO2	C4

i)

```
void swap()
{
   int a, b, temp;
   temp = a;
   a = b;
   b = temp;
}
```

ii)

```
int fun1(int N)
{
   int i, j, a = 0;
   for (i = 0; i < N; i++) {
       for (j = N; j > i; j--) {
           a = a + i + j;
   }
   return a;
}
```

iii)

```
void fun2(int N)
{
   int a = 0, i = N;
   while (i > 0) {
       a += i;
       i /= 2;
   }
}
```

iv)

```
int fun(int n)
{
  int count = 0;
  for (int i = n; i > 0; i--)
         count += 1;
  return count;
}
```

d)	For each of the following patterns P and texts T, find the number C of comparisons to find the INDEX of P in T using the *pattern matching algorithm* you studied. i) P = aab, T = ababbabbbbaaaabbbb ii) T = 1234567890, P = X *(X is the last two digits of our ID, i.e. if your ID is C193231, then P=X=31)*	2	CO3	C3
2. a)	Suppose ACAD maintains a linear array STUCGPA(22001:22099) such that STUCGPA[K] contains the CGPA of the student who bears the ID number K. Write a module for each of the following tasks- i) Print the ID Number of the students who have CGPA above 3.75. ii) Count the number of students who have CGPA above 3.50.	1.5	CO4	C5
b)	Consider an array A (5:10, 1:10, -2:10). i) Find the *length* of each dimension and the *number of elements* in A. ii) Suppose Base (A) = 20Y *(Y is the last digit of our ID, i.e. if your ID is C193207, then Y=7)* and w = 4 words per memory cell for A. Find the effective indices E_1, E_2, E_3 and the address of the element A [7, 5, -1] assuming A is stored in *row-major order* [if last digit of your ID is even] / *column-major order* [if last digit of your ID is odd]	2	CO3	C3
c)	Given a string **MORALITY**, find the number of *comparisons* (C) and number of *interchanges* (D) needed to *sort* the string *alphabetically* by using *bubble sort* algorithm.	1.5	CO3	C3
d)	Each student in a class of 40 students takes 5 tests in which scores range between 0 and 100. Suppose the test scores are stored in a 40x5 array TEST. Write a module which i) Find the average mark for each test. ii) Finds the final grade for each student where the final grade is the average of the student's three highest test scores.	2	CO4	C5

3. a) Suppose the following stack of integers is in memory where STACK is allocated N = 8 memory cells: 1 CO1 C2

TOP = 4 STACK: 11, 22 **N**, 33,__, __, __, __

Describe the stack as the following operations take place –

i) POP (STACK, ITEM) iv) PUSH (STACK, 66)

ii) PUSH (STACK, 44) v) POP (STACK, ITEM)

iii) PUSH (STACK, 55) vi) POP (STACK, ITEM)

[Here N is the last two digits of our ID, i.e. if your ID is C193216, then N=16]

b) Suppose stacks A[1] and A[2] are stored in a linear array STACK with N elements, as pictured in Fig. 6.37. Assume TOP[K] denotes the top of stack A[K]. 2 CO4 C5

(a) Write a procedure PUSH(STACK, N, TOP, ITEM, K) which pushes ITEM onto stack A[K].

(b) Write a procedure POP(STACK, TOP, ITEM, K) which deletes the top element from stack A[K] and assigns the element to the variable ITEM.

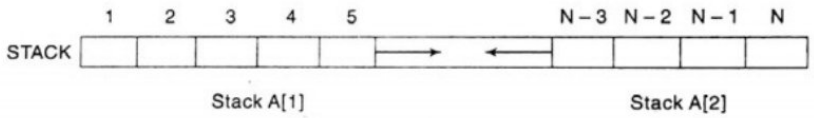


Fig. 6.37

c) Evaluate each of the following postfix expression using the algorithm that you have studied. 2 CO3 C3

P_1: **N**, 7, 3, + , * , 5, 2, 8, - , / , +

P_2: 3, 1, +, 2, ↑, **N**, 4, -, 2, /, +, 5, *

[Here, **N** is the last digit of your ID. For example, if ID = C193009 then N = 9]

d) Consider the following *infix* expression Q: 2 CO3 C3

Q: (A * (B - D) ↑ E + F) * (G – H / K)

Translate Q into its equivalent *postfix* expression P using the algorithm you studied.

International Islamic University Chittagong

Department of Computer Science & Engineering

Program: B.Sc. in CSE; Semester: 3rd

Online Mid Term Examination, Spring-2022

Course Code: CSE-2323 **Course Title: Digital Logic Design**

Time: 03 hour **Total Marks:** 21

Answer the following three (3) questions. Each question carries 07 marks. No late submission will be accepted. Students must use gsuite ID for submitting assignment into Google Classroom.

Question : 1	a. Express the Boolean function F = A + B'C as a sum of minterms.	2
	b. A Boolean function F defined on the three input variables x, y and z is 1 if and only if number of 1(one) input is even. Draw the truth table for the above functions and express it in canonical and also minimize the canonical form.	2
	c. We can perform logical operations on strings of bits by considering each pair of corresponding bits separately (called bitwise operation). Given two eight-bit strings A = 10110001 and B = 10101100, evaluate the eight-bit result after the following logical operations: (a)AND (b) OR (c) XOR (d)NOT A (e) NOT B	1
	d. A Boolean function F defined on the three input variables x, y and z is 1 if and only if number of 1(one) input is even. Draw the truth table for the above functions and express it in canonical and also minimize the canonical form.	2
Question : 2	a. Show that the dual of the exclusive-OR is equal to its complement	1
	b. Write down the necessary conditions for check board configuration	1
	c. Implement the following Boolean function F , together with the don't-care conditions d , using no more than two NOR gates: $F(A, B, C, D) = \sum(2, 4, 10, 12, 14)$ $d(A, B, C, D) = \sum(0, 1, 5, 8)$. Assume that both the normal and complement inputs are available.	2 1
	d. Derive the circuits for a three-bit parity generator and four-bit parity checker using an odd parity bit.	2
	e. Proof the following using Consensus Theorem: $xy + x`z + yz = xy + x`z$	

Question : 3	a. Encode the data bits 1101 into the 7 bit even parity Hamming Code. b. Design a combinational circuit with three inputs are *A*, *B*, and *C*, and three outputs are *x*, *y*, and *z* . When the binary input is 0, 1, 2, or 3 the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is two less than the input. c. Implement the Boolean function: F(A, B,C, D) = C + (A + B′)(B′ + D)(A′ + D) with the minimum number of NAND gates. b) NOR gates.	3 2 2

N.B: The meanings of symbol enclosed in bracket (`) is complement.

****The End****

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE Midterm Examination, Spring-2022

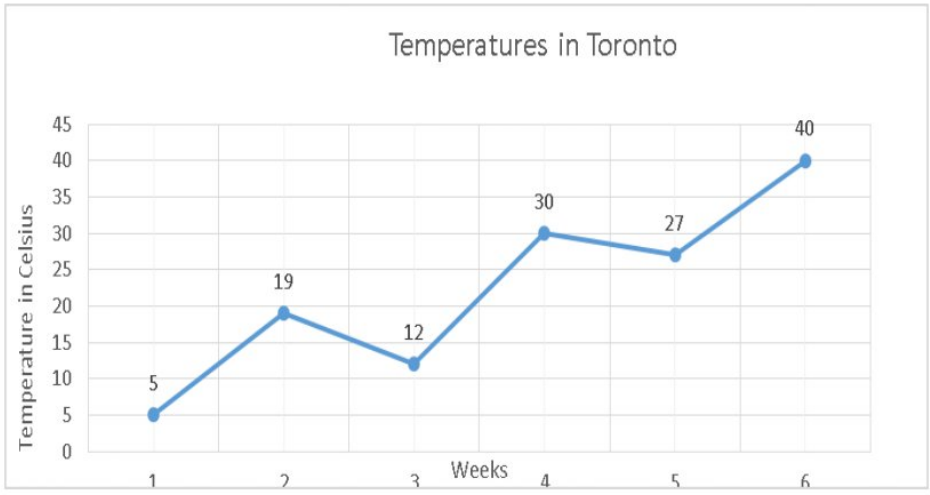
Course Code: STAT 2311 Course Title: Probability and Statistics

Total marks: ***21, Section: 3AM***

Time: ***2*** *hours* ***30*** *minutes for* ***exam*** *+* ***30*** *minutes for* ***submission***

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

			CO	DL
1.				
a)	Statistics play an intrinsic role in computer science and vice versa-Explain.	**3**	**CO1**	**C6**
b)	Why is a sample used more often than a population?Determine whether the data set is a population or a sample. Explain your reasoning. (i) The BMI of each person. (ii) The speed of every fifth car passing a police speed trap. (iii)The annual salary for each employee at a company. (iv)A study of 1501 infants in Bangladesh was conducted to find a link between heart rhythm abnormality and sudden infant death syndrome. (v) A survey of 1104 households in a certain region found that 65% subscribe to cable television.	**2**	**CO1**	**C5**
c)	Answer the questions as it pertain to the following graph.	**2**	**CO1**	**C6**



(i) What is the range of the values on the horizontal scale?
(ii) How many points are on the graph?
(iii)What is the highest temperature recorded?
(iv)At what point did the temperature dip?

2.				
a)	Explain median graphically. Discuss its difference from the mean. In which situations is the median more effective to describe the center of the data?	**3**	**CO1**	**C3**

b) If the arithmetic mean of the data given below is 28, Calculate (i) The missing frequency, and (ii) The median and (iii) the mode of the series. **4 CO1 C6**

Profit (in TK.):	0-10	10-20	20-30	40-50	50-60	60-70
No. of Firms:	12	18	27	X	17	6

Also draw an ogive curve and hence locate median.

3.

a) What are the differences between central tendency and dispersion? **2 CO1 C3**

b) The grouped frequency table shows the length of service in years of employees who have been working for a company for at least ten years. Calculate an estimate of the mean deviation and standard deviation of the length of service of these employees. Verify that $\sigma_x > MD_{\bar{x}}$. **3 CO1 C5**

Length of Service (x)	10≤x<15	15≤x<20	20≤x<25	25≤x<30	30≤x< 40
Frequency (f)	5	**Last two digit of your ID**	12	3	2

c) Suppose the heights in inches of the students in your class are as follows: 66, 68, 63, 60, 62, 64, 64, 65, 66, 66, 66, 66, 68, 68, 69, 70, 71, 72, 72, 71, 73, and **your height in inches**. What would be the mean of this data? How about the median and mode? Would you be able to calculate the variance for this data? How about the standard deviation? **2 CO1 C4**

THE END

International Islamic University Chittagong
Department of Computer Science & Engineering

B.Sc. in CSE *Online Mid Term Assessment* **, Spring -2022**
Course Title: Mathematics-III Course Code: MATH-2307 (New)
Course Title: Mathematics-IV Course Code: MATH-2401 (Old)

Total Marks: 21 Section: 3AM+3BM

Time 2 hours 30 minutes for preparing assignment and 30 minutes for submission

Answer all the questions; ***Be careful to follow the instructions below*** for preparing and submitting the assignment; Figures in the right hand margin indicate full marks

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1. a) Check whether it is singular matrix $\begin{bmatrix} 7 & 2 & f \\ 2 & 4 & e \\ 3 & 5 & 1 \end{bmatrix}$; Where d and e are the digits of your own metric number 2

b) Find the inverse of $A = \begin{bmatrix} 1 & e \\ 3 & f+1 \end{bmatrix}$ Where d and f are the digits of your own metric number 3

c) Construct the 4×4 Matrix A having: 2

$$A = (a_{ij}) = 4i + j \;; when\, i > j$$
$$= 0 \quad ; when\, i = j$$
$$= 3i - j \;; when\, i < j$$

2. Determine which of the following vectors are Eigen vectors for $A = \begin{pmatrix} 3 & d \\ -1 & -6 \end{pmatrix}$ showing your analysis procedure graphically 6

$(a)\begin{pmatrix} 2 \\ e \end{pmatrix}$ $(b)\begin{pmatrix} c \\ 2 \end{pmatrix}$ $(c)\begin{pmatrix} e \\ f \end{pmatrix}$; Where a , b, c, d, e and f are the digits of your own metric number

Which variable(s) is (are) free variables for the linear system of equations 1

$$7x + 5y + 9z = 6$$
$$w = 1$$

3. a) Test whether $\lambda_1 = f$ *and* $\lambda_2 = e$ are eigen values for $A = \begin{bmatrix} 5 & 3 \\ 2 & 3 \end{bmatrix}$; Where d and f are the digits of your own metric number 2

b) Solve the system of linear equations 5

$$(e+2)x + 9y - z = 27$$
$$x - 8y + 16z = 10$$
$$ax + y + 15z = 37$$

Where a and f are the digits of your own metric number

Instructions:

If your matric no is C171023 then you can assign your digit as follows

C	1	7	1	0	2	3
	↓ a	↓ b	↓ c	↓ d	↓ e	↓ f

To solve the above problem, you need to use your own metric number where needed