Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2022

Subject Name : Mathematics

Subject Code : 4CS01TMH1 **Branch: B.Sc.I.T.**

Semester: 1 **Date: 03/01/2023** **Time: 11:00 To 01:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) **A set which have not a single element is called _____ set.** 1
a. Empty Set
b. Union
c. Intersection
d. None of These

b) **In SET theory A'= _____** 1
a. Universal Set U b. Empty Set
c. Fixed Set d. None of these

c) **A Set of Rule between to Non-empty set is called _____** 1
a. Function b. Set
c. Matrix d. Standard Deviation

d) **All diagonal Elements of are 1 is called _____ Matrix.** 1
a. Null b. One
c. overflow d. Scalar

e) **A Matrix which all elements are 0 is called_____ matrix** 1
a. Grouped b. NULL
c. Alternate d. None of these

f) **---------- is not a types matrix.** 1
a. Unit c. NULL
b. Scalar d. Compose

g) **Sum of all Diagonal elements is called as _____** 1
a. Trace of Matrix c. Transpose of Matrix
b. Total of Matrix d. None of these

h) **(A')'=_____** 1
a. Empty Set c. A
b. Universal Set d. None of these

i) **_____ is a Mathematical Software.** 1
a. MATLAB c.WIDE
b. SPSS d.None of these

j) **_____ is a Statistical Software.** 1
a SPSS c. ANOVA

b.ALPHA d. None of these

k) Define Term : Matrix 1

l) Define Term : Function 1

m) Define Term : SET 1

n) What do you mean by Scalar Matrix? 1

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

(A) Prove Demrogan's law using set theory **(7)**

(1) (AUB)'=A' Ω B' (2) (AΩB)'=A' U B'

(B) **Universal SET U=** {1,2,3,4,5,6,7,8,9,10}**, SET A=**{1,2,3,4}**,B=**{5,6,7} and C={6} Find out the following **(7)**

(1) (AUB)' (3) A'U C (5)A' Ω B' Ω C'

(2) A' Ω B' (4) B U C

Q-3 **Attempt all questions** **(14)**

(A) Let A={1,2,3,4} find the range of each of the following functions. **(7)**

(1) $f:A->R, f(x)=2^x$

(2) g: $A->R, g(x)=|x-3|$

(3) h:A->R, $h(x)=x^2- 5x+6$

(B) If f(x)=1/1-x , Find the value of f[f{f(x)}] **(7)**

Q-4 **Attempt all questions** **(14)**

(A) What is Function? Explain the Classification of Functions in brief. **(7)**

(B) **Define following term with example.** **(7)**

(1) Transpose of Matrix (2) Trace of Matrix

Q-5 **Attempt all questions** **(14)**

(A) If Set A={1,2,3,4}, Set B={1,3,5}, Set C={4,6,8}, Set D={5,7} Find out the Following **(7)**

(1) A×B×C (2) B×D (3) C×D

(B) Show that (6,6),(2,3) and (4,7) are the vertices of Right angled Triangle. **(7)**

Q-6 **Attempt all questions** **(14)**

(A) If $f(x) = \frac{1 + x}{1 - x}$, Show that $f[f(\tan\emptyset)] = -\cot\emptyset$ **(7)**

(B) If Matrices $A = \begin{vmatrix} 8 & 2 & 3 \\ 1 & 1 & 2 \\ 3 & 2 & 1 \end{vmatrix}$ **Find out $A^2-3A+2I$ where I is Scalar Matrix** **(7)**

Q-7 **Attempt all questions** **(14)**

(A) If Matrices $A = \begin{vmatrix} 8 & 2 & 3 \\ 1 & 1 & 2 \\ 3 & 2 & 1 \end{vmatrix}$ **Find Out A^{-1} (Inverse Matrix A)** **(7)**

(B) if Universal Set U={-3,-1,0,1,3},A={-3,-1,1},B={-1,1,3}and C={-1,0,1} then verify following **(7)**
(1)(AUB)'= A' Ω B' (2)AU(B Ω C)=(AUB) Ω (AUC)

Q-8 **Attempt all questions** **(14)**

(A) Define following terms **(7)**
(1) Row and Column Matrix **2**
(2) Diagonal Matrix **2**
(3) Square Matrix **2**
(4) Unit Matrix **1**

(B) Explain Derivative of Function in Differentiation. **(7)**