

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Semester Mid Semester Examination
Course No.: CEE 4703
Course Title: GIS Application in Civil Engineering

Winter Semester: 2022-2023
Full Marks: 75
Time: 1.5 hours

There are 4 (Four) Questions. Answer any All questions. Programmable calculators are not allowed. Do not write on this questions paper. The symbols have their usual meaning. The exam is **OPEN BOOK**. Each student is allowed to carry the course materials as one book. Students may have own writings inside the book.

- 1(a) Write an SQL sentence where you, from the example table "Students" (see tables (5) below), create a new table containing the names of all students with a mark lower or CO2 equal to 75. Draw the output table showing the results, too. PO4

Table: Students

Student_ID	Name	Subject	Mark
12	Ibrahim	CEE4101	50
51	Niaz	CEE4191	83
33	Hridoy	MATH101	74
47	Rifat	CEE4101	70
4	Farhan	CEE4191	91
78	Anik	CEE4101	62
48	Saadi	CEE4191	38
37	Faiza	CEE4101	45

- (b) Below are two raster maps of a land where the cell values represent production of crop A and crop B, respectively. Identify the areas where i) only crop A is produced, ii) only crop B is produced, iii) none of the crops are produced, and, iv) both the crops are produced. In order to maximize your yield, what will be your strategy (which crop will be produced in which cell)? What kind of strategies will yield the lowest production? Answer the questions with appropriate raster analysis method and show the steps involved in calculation. (15) CO2 PO4

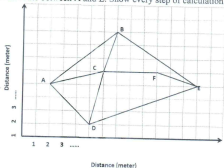
3	5	2	6	0
6	5	1	9	0
10	0	7	2	0
2	5	0	4	4
0	8	3	0	7

Crop A

5	1	0	3	0
2	0	6	3	8
0	2	8	5	0
7	0	0	1	6
9	1	0	8	2

Crop B

2. Find the shortest route between A and E. Show every step of calculation.



(20)
CO2
PO4

3. Table below represents the coordinates of a vector map kept in the simple polygons with co-ordinate list method. Out of those points, construct at least four polygons in the map (There may be other features present, too). Draw the vector map on a graph paper and present the data in topological polygon structure using Spaghetti model and Topological model.

ID	X	Y	ID	X	Y
N1	2	6	N6	4	6
N2	1	3	N7	6	7
N3	3	2	N8	7	6
N4	5	3	N9	6	5
N5	5	5	N10	6	4

(20)
CO2
PO4

- 4(a) How do you calculate the RMSE error using a DGPS? Demonstrate mathematically.
- (b) Draw the polyline having sequentially connected nodes as [(2,9); (4,8); (5,9); (7,8); (8,5); (7,4); (5,5); (2,3); (3,2); (2,1)] in a graph paper and demonstrate step by step how the vector shape can be simplified using Douglas-Peucker algorithm. The tolerance level is one unit.

(10)
CO1
PO1

(5)
CO1
PO1