Task 2 in discrete math:

Study materials:

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/u4dm2023.docx

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/u5dm2023.docx

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/10graphs.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/11shortest.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/12trees.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/13trees.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/14circuits14etc.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/14boolean14algebra14.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/15boolean15algebra15.ppt

Instructions:

Write all your answers in this Word Document and email the Word Document with your answers to me.

Try to write only text. Try to avoid pictures, videos and other things, which make files big.

Write your name(s)

Write your student number(s)

s is your student number.

k = s mod 10000 = m10000

T = s mod 100 = m100

m = s mod 35 = m35

a = s mod 25 = m25

L = s mod 10 = m10

m9 = s mod 9

e = s mod 8 = m8

m7 = s mod 7

m6 = s mod 6

m5 = s mod 5

m4 = s mod 4.

m3 = s mod 3

m2 = s mod 2

Questions:

1. Simplify the expression for your *e*.

e = 0: A´BC + BC + AB´ + ABC + AC´ + BC´

e = 1: AB´C + B´C + A´B´ + ABC´ + AC´ + BC´

e = 2: B´C + B´C + A´B´C´ + ABC´ + AB´C´ + BC´

e = 3: BC´ + B´C + A´B´C´ + ABC´ + AB´C´ + B´C´

e = 4: A´BC + BC + AB´ + ABC + AC´ + BC´ + A´B´C

e = 5: A´BC + AB´ + ABC + AC´ + BC´ + A´B´C

e = 6: BC + AB´ + ABC + AC´ + BC´ + A´B´C

e = 7: A´BC´ + BC + AB´ + AC´ + BC´ + A´B´C

Use Karnaugh Map.

https://en.wikipedia.org/wiki/Karnaugh\_map

2. Find adjacency and incidence matrixes for the graphs:

m6 = 0: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student16number16graph16.docx

m6 = 1: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees16graphs2solve16.docx

m6 = 2: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student4number4graph.docx

m6 = 3: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student3number3graph.docx

m6 = 4: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees24graphs2solve.docx

m6 = 5: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees4graphs2solve.docx

3. How many edges are in KT and KT,T?

4. Apply Dijkstra’s, Prim's and Kruskal’s algorithms to the graphs. Traverse the trees.

m6 = 0: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student16number16graph16.docx

m6 = 1: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees16graphs2solve16.docx

m6 = 2: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student4number4graph.docx

m6 = 3: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student3number3graph.docx

m6 = 4: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees24graphs2solve.docx

m6 = 5: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees4graphs2solve.docx

5. Give Euler’s, Hamiltonian’s cycles, and paths in the graphs:

m4 = 0: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student16number16graph16.docx

m4 = 1: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees16graphs2solve16.docx

m4 = 2: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/euler6cycle.ppt

m4 = 3: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/question2euler.ppt

6. Is the graph planar? Why?

m7 = 0: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/graph22jun16.docx

m7 = 1: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/graph7am22jun16.docx

m7 = 2: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/graph8am22jun16.docx

m7 = 3: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/graph1pm22june16.docx

m7 = 4: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/student16number16graph16.docx

m7 = 5: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/trees16graphs2solve16.docx

m7 = 6: http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/planar4graphs.ppt

7. Find the graceful labeling of $K\_{m\_{3}+2, m\_{4}+2}$

ii = FreeFile

Open "D:\bipartate33k.txt" For Output As #ii

Dim e(9)

e(1) = 9

Max = 8

For v1 = 1 To Max - 3

For v2 = v1 + 1 To Max - 2

For v3 = v2 + 1 To Max - 1

For v4 = v3 + 1 To Max

e(2) = v4

e(3) = v3

e(4) = Abs(9 - v1)

e(5) = Abs(v4 - v1)

e(6) = Abs(v3 - v1)

e(7) = Abs(9 - v2)

e(8) = Abs(v4 - v2)

e(9) = Abs(v3 - v2)

If e(1) <> e(2) And e(1) <> e(3) And e(1) <> e(4) And e(1) <> e(5) Then GoTo 11

GoTo 10

11 If e(1) <> e(6) And e(1) <> e(7) And e(1) <> e(8) And e(1) <> e(9) Then GoTo 111

GoTo 10

111 If e(2) <> e(3) And e(2) <> e(4) And e(2) <> e(5) And e(2) <> e(6) And e(2) <> e(7) And e(2) <> e(8) Then GoTo 22

GoTo 10

22 If e(2) <> e(9) Then GoTo 222

GoTo 10

222 If e(3) <> e(4) And e(3) <> e(5) And e(3) <> e(6) And e(3) <> e(7) And e(3) <> e(8) And e(3) <> e(9) Then GoTo 33

GoTo 10

33 If e(4) <> e(5) And e(4) <> e(6) And e(4) <> e(7) And e(4) <> e(8) And e(4) <> e(9) Then GoTo 44

GoTo 10

44 If e(5) <> e(6) And e(5) <> e(7) And e(5) <> e(8) And e(5) <> e(9) Then GoTo 55

GoTo 10

55 If e(6) <> e(7) And e(6) <> e(8) And e(6) <> e(9) Then GoTo 66

GoTo 10

66 If e(7) <> e(8) And e(7) <> e(9) Then GoTo 77

GoTo 10

77 If e(8) <> e(9) Then GoTo 1

10 Next v4

Next v3

Next v2

Next v1

GoTo 2

1 Print #ii, v1, v2, v3, v4

2 End Sub

8. Color your graphs using as few colors as possible. Find the chromatic numbers of the graphs.

9. Color the map of the country number T using as few colors as possible.

http://www.worldometers.info/geography/alphabetical-list-of-countries/

10. Find the number of regions for the graph with L+20 edges and e+10 vertices.

11. Petersen graph:

m6 = 0: Does Petersen graph satisfy the condition e < 2v – 4?

m6 = 1: Does Petersen graph satisfy the condition e < 3v – 6?

m6 = 2: Is this graph planar?

m6 = 3: Why?

m6 = 4: Which important graph is Petersen graph similar to?

m6 = 5: Do graceful labeling of Petersen graph.

http://azspcs.com/Contest/GracefulGraphs

https://en.wikipedia.org/wiki/Petersen\_graph

https://en.wikipedia.org/wiki/Planar\_graph

https://en.wikipedia.org/wiki/Kuratowski%27s\_theorem

12. How do you use discrete mathematics?

13. Give tree for first move in chess.

31. Explain the formulas, equations, concepts, laws, theories of the discrete math.