1. **(10: 2,1,2,2,2,1 marks)**

A traversable network can be defined as a network in which each node is visited and each path is travelled only once. You can test this if when you trace each path exactly once by beginning at a point and not lifting your pencil from the paper.

Consider the networks below. Show which of the networks below are traversable. Clearly mark the point where you start (S) and the point where you finish (F).

Traversable



Not traversable

2. (**4 marks)**

Draw **four** traversable networks of your own, showing start, finish and direction of the journey.

3. (**16 marks: 8,8)**

Half mark start, finish and direction on each network

One mark per row on table

|  |  |  |  |
| --- | --- | --- | --- |
| Network | Total Number  of Nodes | Number of  Even-Nodes | Number of  Odd-Nodes |
| 1. | 2 | 0 | 2 |
| 2. | 4 | 2 | 2 |
| 3. | 3 | 3 | 0 |
| 4. | 4 | 2 | 2 |
| 5. | 3 | 3 | 0 |
| 6. | 5 | 5 | 0 |
| 7. | 6 | 4 | 2 |
| 8. | 6 | 4 | 2 |

4. **(2 marks)**

When is a network traversable?

When 0 or 2 odd nodes: One mark for each

5 **(2 marks)**

Below is a network that shows the roads and towns of a salesperson’s trip. The salesperson can leave home and go to every town and return home without going over any road twice. The salesperson lives in one of the following towns. Circle the correct answer.

Salesperson could live in town D or town E, but he would not be able to

start and finish in the same town.



6. **(2 marks)** Answer need to ensure that there are only two or no odd nodes

**7**. **(7 Marks: 3, 4)**

Use the tables to draw the appropriate networks

**a)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | G | H | I |
| G | - | 5 | - |
| H | 5 | - | 4 |
| I | - | 4 | - |

**b)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| A | - | 4 | 2 | 1 |
| B | 4 | - | - | 7 |
| C | 2 | - | - | - |
| D | 1 | 7 | - | - |

**8**. **(3 Marks)**

Suppose you need to travel from Tacoma, WA (vertex T) to Yakima, WA (vertex Y). Looking at a map, it looks like driving through Auburn (A) then Mount Rainier (MR) might be shortest, but it’s not totally clear since that road is probably slower than taking the major highway through North Bend (NB). A graph with travel times in minutes is shown below. An alternate route through Eatonville (E) and Packwood (P) is also shown.

96

79

27

76

96

57

20

36

104

T

A

NB

MR

E

P

Y

**9**. **(4 Marks)**

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Write down the length of the shortest path from **S** to **F**.