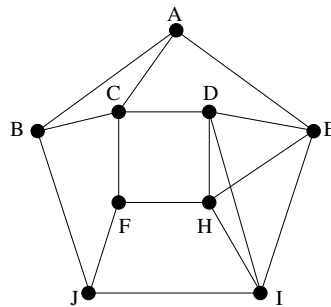


Second Repeat of the First Midterm Test

1. The neptun code of a student is a sequence consisting of 6 characters, each of which is either one of the 26 letters of the English alphabet or one of the digits $0, 1, \dots, 9$. How many neptun codes are there which contain the letter A, but not the digit 1?
2. How many pairwise non-isomorphic trees are there on 10 vertices which contain only two kinds of degrees?
3. Decide whether the following graph is planar or not:



4. Show that if G is a simple 6-regular bipartite graph on 16 vertices, then G contains an Euler circuit. (A graph is 6-regular, if each of its degrees is 6.)
5. At least how many edges must be added to $K_{4,5}$, the complete bipartite graph on $4+5$ vertices so that the graph obtained contains a Hamilton cycle?
6. From a complete graph on 10 vertices we delete the edges of two such cycles on 3 vertices which have exactly one vertex in common. Determine the chromatic number of the graph obtained.

Total work time: 90 min.

The full solution of each problem (including explanations) is worth 10 points. Show all your work! Results without proper justification or work shown deserve no credit.

Notes and calculators (and similar devices) cannot be used.

Grading: 0-24 points: 1, 25-33 points: 2, 34-42 points: 3, 43-51 points: 4, 52-60 points: 5.