Algorithmics
Undergraduate 2nd year (S4) - API
Final Exam #4 (P4)
16 May 2017 - $10h$
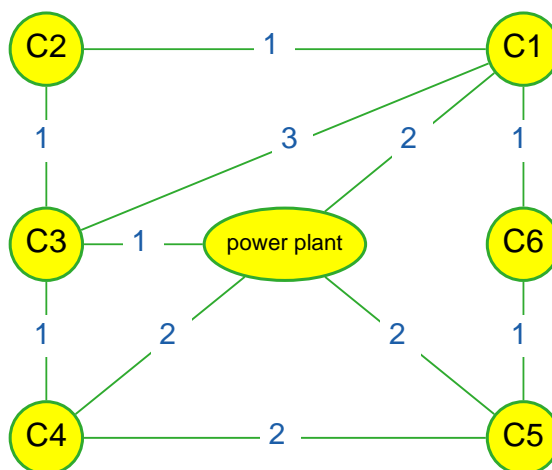### Answer Sheets

Answers 1 (MST and SP ... − *3 points*)

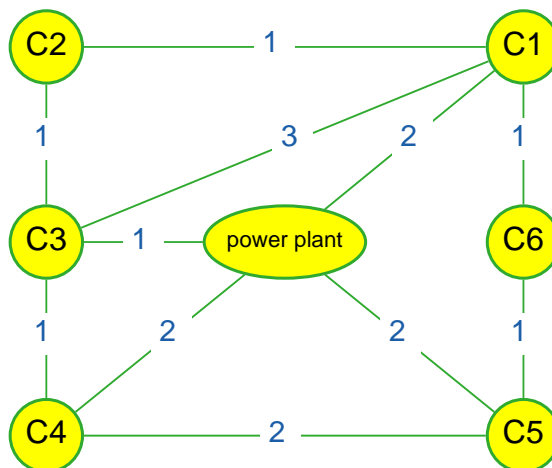1. The directed graphs on which the Bellman algorithm can be executed are:

   _____

2. The algorithm determining the mst of an undirected graph whose principle is close to that of Dijkstra is:

   _____

3. Highlight the connections you select to represent an mst of the graph.

4. Highlight the connections you select to represent the shortest path tree from the "power plant" vertex.

Answers 2 (**Condensation** – *4 points*)

Specifications:

The function `condensation(G, scc)` builds the condensation G_R of a digraph G, with *scc* its component list. The function returns G_r and the vector of components: a vector that give for each vertex, the number of its component (the vertex in G_R).

Answers 3 (**Digraphs and Mystery** – ***3 points***)

1.

	Call number	Returned result
(a) test(G_2)		
(b) test(G_3)		

2. *What is the information returned by* test(G)*?*

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Answers 4 (**T-spanner** – ***10 points***)

1. (a) *t*-spanners for a stretch factor of 2

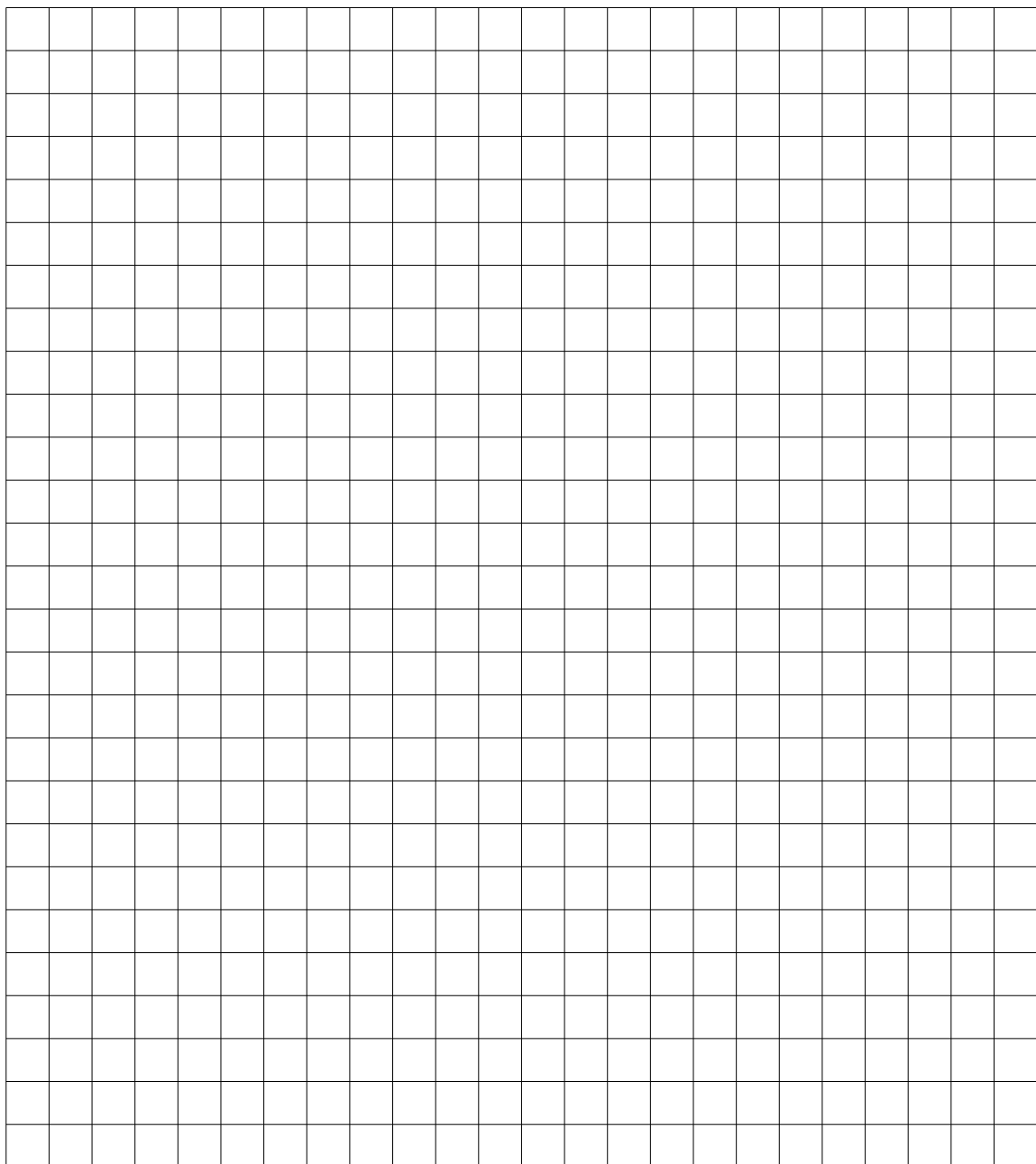(b) *t*-spanners for a stretch factor of 5

2. (a) **Specifications:**
The function `Dijkstra(G, src, dst)` returns the length of the shortest path between *src* and *dst* in G, $+\infty$ if there is no path.
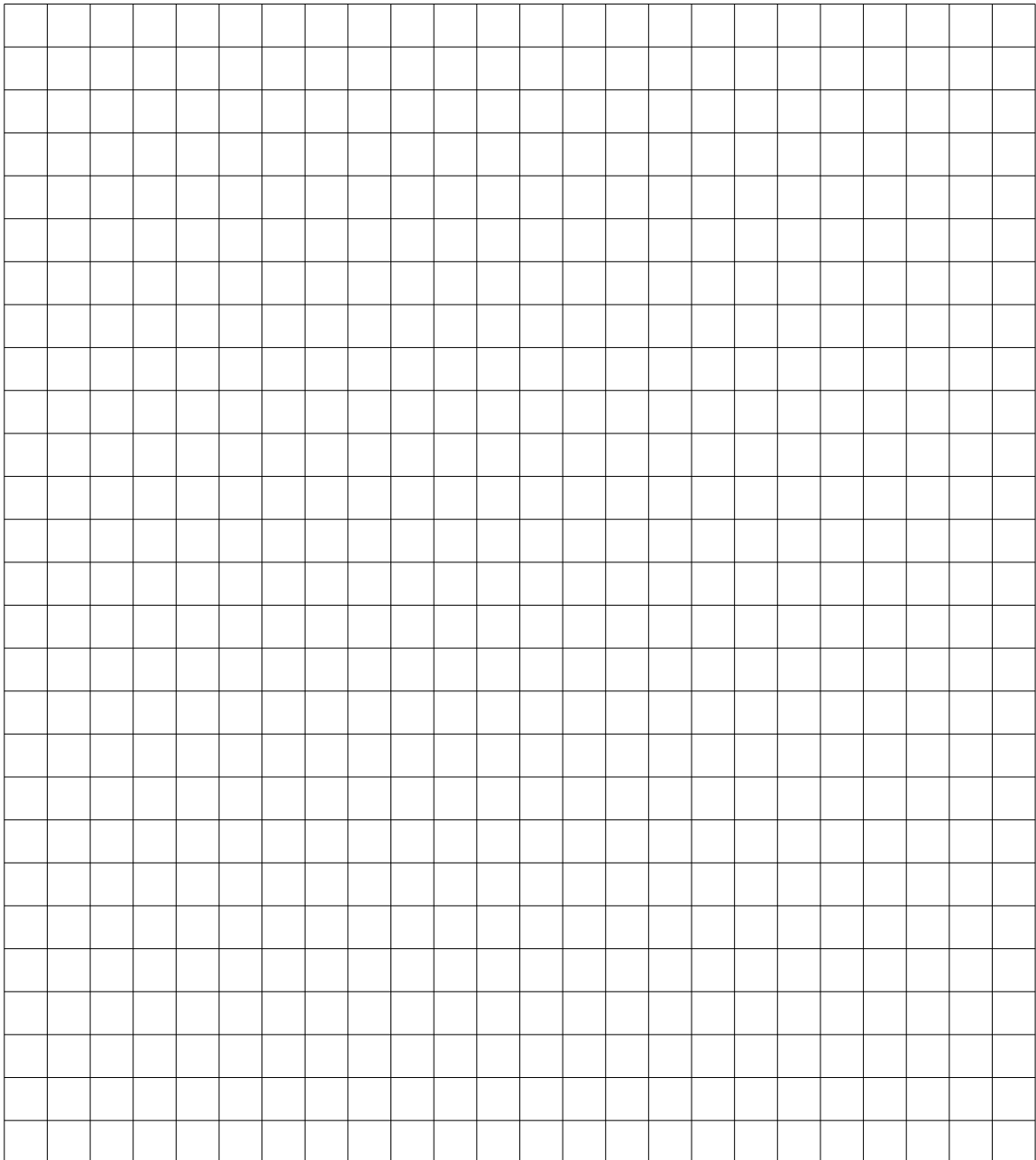
(b) **Specifications:**
  The function pathGreedy(n, L, t) returns a t-spanner (with stretch factor $= t$) for the set of n points (number form 0 to $n-1$) with L the list of triplets (p, q, $|pq|$) (as described above).

bonus When the stretch factor is $n - 1$ with n the number of points, what is the t-spanner?

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