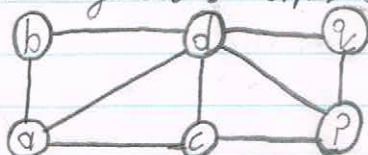


MATH 3802 Tutorial March 5<sup>th</sup>:

throughout this assignment  $G=(V,E)$  denotes the undirected graph depicted in the figure below:



Tutorial:

① Show the degrees of a & b:

degree is # adj. edges so a is 3 & b is 2 ( $\deg(a)=3$  &  $\deg(b)=2$ )

② Show a connected Spanning Subgraph of  $G$  having exactly 6 edges:

$ab, ad, dq, qr, pc, cd$

③ Show that  $M=\{ab, dp\}$  is a matching in  $G$ :

Since  $ab$  &  $dp$  are disconnected edges it's a matching.  $c$  &  $q$  are disconnected so it's NOT perfect.

④ Show that  $N=\{ab, cd, pr\}$  is a perfect matching in  $G$ :

$ab, cd, pr$  covers all nodes in  $G$  & the whole graph is spanned

$\therefore$  It's a Perfect matching

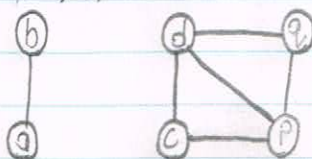
Problems:

① ASK for the degrees of the remaining nodes:

$\deg(a)=3, \deg(b)=2, \deg(c)=3, \deg(d)=5, \deg(q)=2, \deg(p)=3$

② ASK for a disconnected Spanning Subgraph of  $G$  having exactly 6 edges:

$dq, qr, pc, cd, dp, ab$  is a valid solution, see the depiction below:



③ ASK for all  $M$ -exposed nodes:

Nodes  $c$  &  $q$  are not endpoints of some edge in  $M$  so they are  $M$ -exposed.

④ ASK for the graph  $(V, M \Delta N)$ :

$M \Delta N = N \setminus M \cup M \setminus N = \{ab, dp\} \cup \{cd, pr\} = \{dp, cd, pr\}$

$V$  includes all the nodes from  $G$ , so there are many singletons

Depiction:

