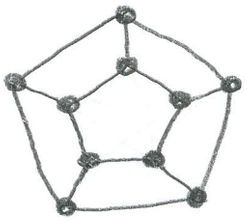
Tut 06 Solutions

#1. (a) G: 

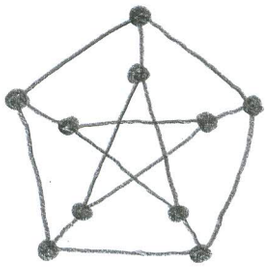
(b) (i) 15 edges, the same as G.

(ii) G has 5 regions of degree 4 and 2 regions of degree 5. Therefore G^* has 5 vertices of degree 4 and 2 vertices of degree 5.

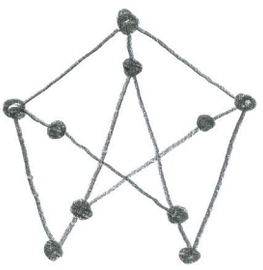
(iii) G has 10 vertices of degree 3, and therefore G^* has 10 regions of degree 3.

#2. $K_{2,2}$:  K_3: 

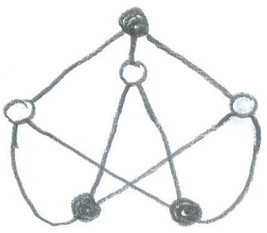
By placing <u>one</u> subdividing vertex on any edge of K_3, we obtain $K_{2,2}$. So, $K_{2,2}$ is a subdivision of K_3.

#3. 

Petersen graph



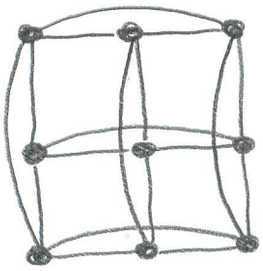
H



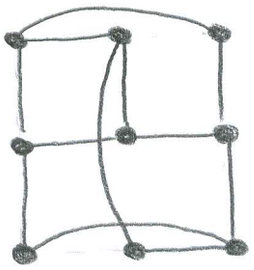
$K_{3,3}$

The Petersen graph has H as subgraph and H is a subdivision of $K_{3,3}$.
Therefore the Petersen graph is non-planar.

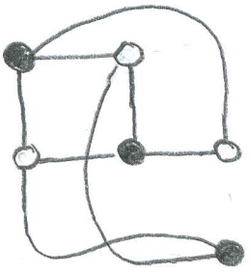
#4.



$K_3 \times K_3$



H

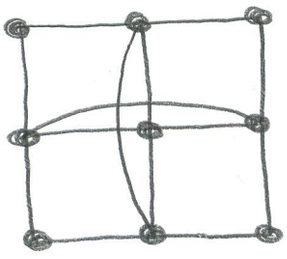


$K_{3,3}$

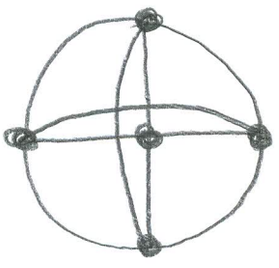
$K_3 \times K_3$ has H as subgraph and H is a subdivision of $K_{3,3}$. Therefore $K_3 \times K_3$ is non-planar.

Another solution:

G:



K_5:



The graph G is a subgraph of $K_3 \times K_3$ and G is a subdivision of K_5. Therefore $K_3 \times K_3$ is non-planar.