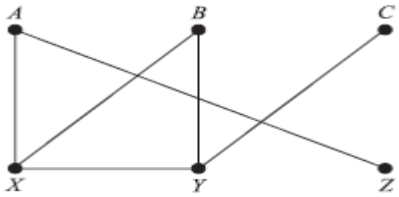
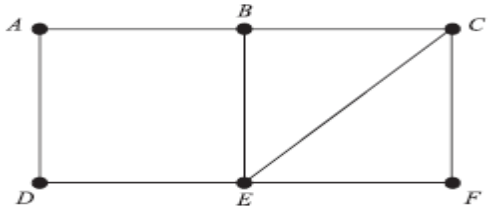
Tutorial on Graphs

Q1: Let G be the graph. Find:

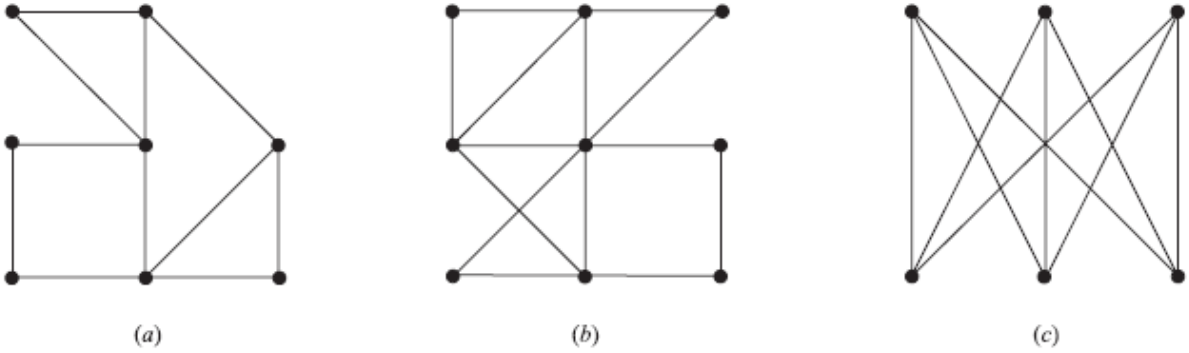


[1] all simple paths from A to C;
[2] All cycles;
[3] Subgraph H generated by $V = \{B, C, X, Y\}$;
[4] All cut points;
[5] All bridges.

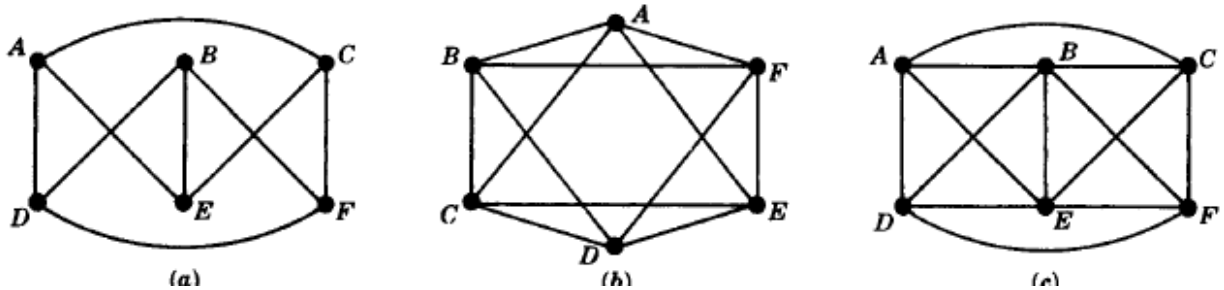
Q2: Find the subgraphs obtained when each vertex is deleted from the given graph. Does G have any cut points?



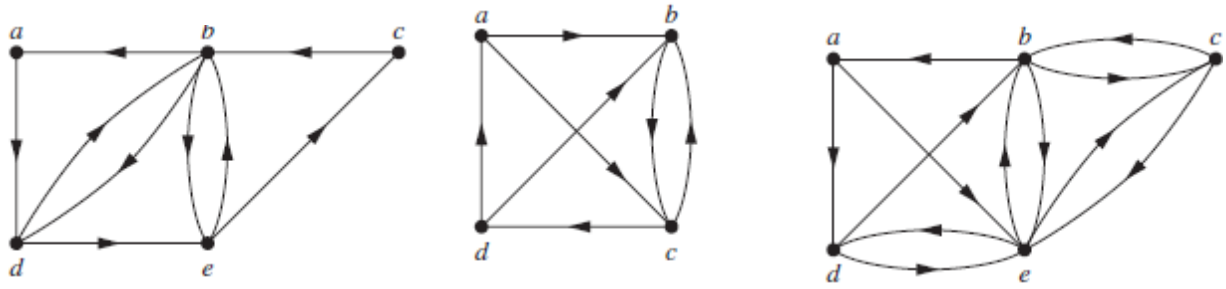
Q3: Consider each graph given below. Which of them are traversable, that is having Euler Path? Which is Eulerian, that is, have an Euler circuit? For those that do not, explain why? And which of these have a Hamiltonian circuit if not why not?



Q4: Draw a Planar representation, if possible, of the graphs given below:



Q5: Determine whether these graphs given below have an Eular circuit. Construct an Eular circuit if exists. If no Eular circuit determine whether the directed graph has Eular path. Construct an Eular path if exists.



Q6: A zoo wants to set up natural habitats in which to exhibit its animals. Unfortunately, some animals will eat some of others when given the opportunity. How can a graph model and a coloring be used to determine the number of different habitats needed and the placement of animals in these habitats?

Q7: The mathematics department has six committees, each meeting once a month. How many different meeting times must be used to ensure that no member is scheduled to attend two meetings at the same time if the committees are C1={Arlinghaus, Brand, Zaslavsky}, C2={ Brand, Lee, Rosen}, C3={ Arlinghaus, Rosen, Zaslavsky}, C4={ Lee, Rosen, Zaslavsky}, C5={ Arlinghaus, Brand}, C6={ Brand, Rosen, Zaslavsky}.