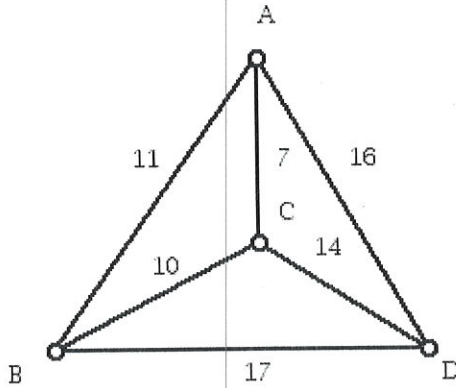


Instructions: Show all work. Use exact answers unless specifically asked to round. Be sure to complete all parts of each problem.

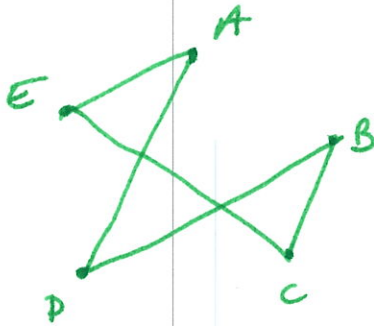
- Use the Brute Force algorithm to find the minimal cost Hamilton circuit for the K_4 graph shown. State the final cost of the minimal circuit. (10 points)



$$\begin{aligned}
 ABCDA &= 11 + 10 + 14 + 16 = 51 \\
 ACBDA &= 7 + 10 + 17 + 16 = 50 \\
 ACPBA &= 7 + 14 + 17 + 11 = \boxed{49}
 \end{aligned}$$

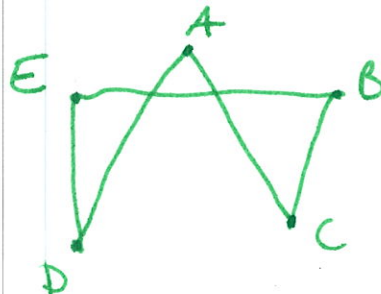
- For the complete graph below, find the approximate minimal cost Hamilton circuit using the indicated method. State the final cost of the circuit. (6 points each)

a. Nearest Neighbor starting at A

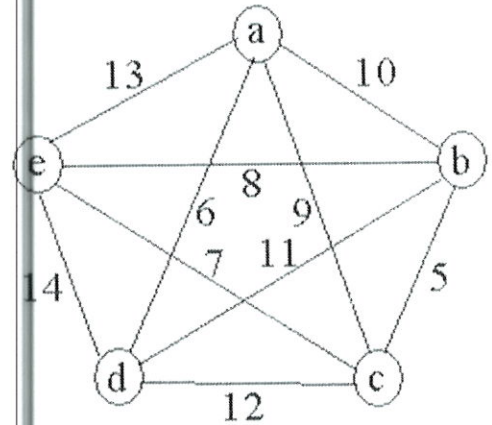


$$6 + 11 + 5 + 7 + 13 = 42$$

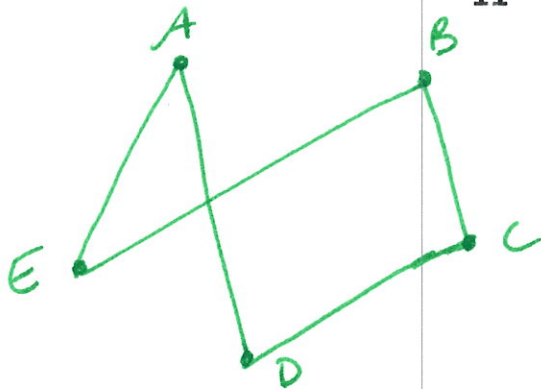
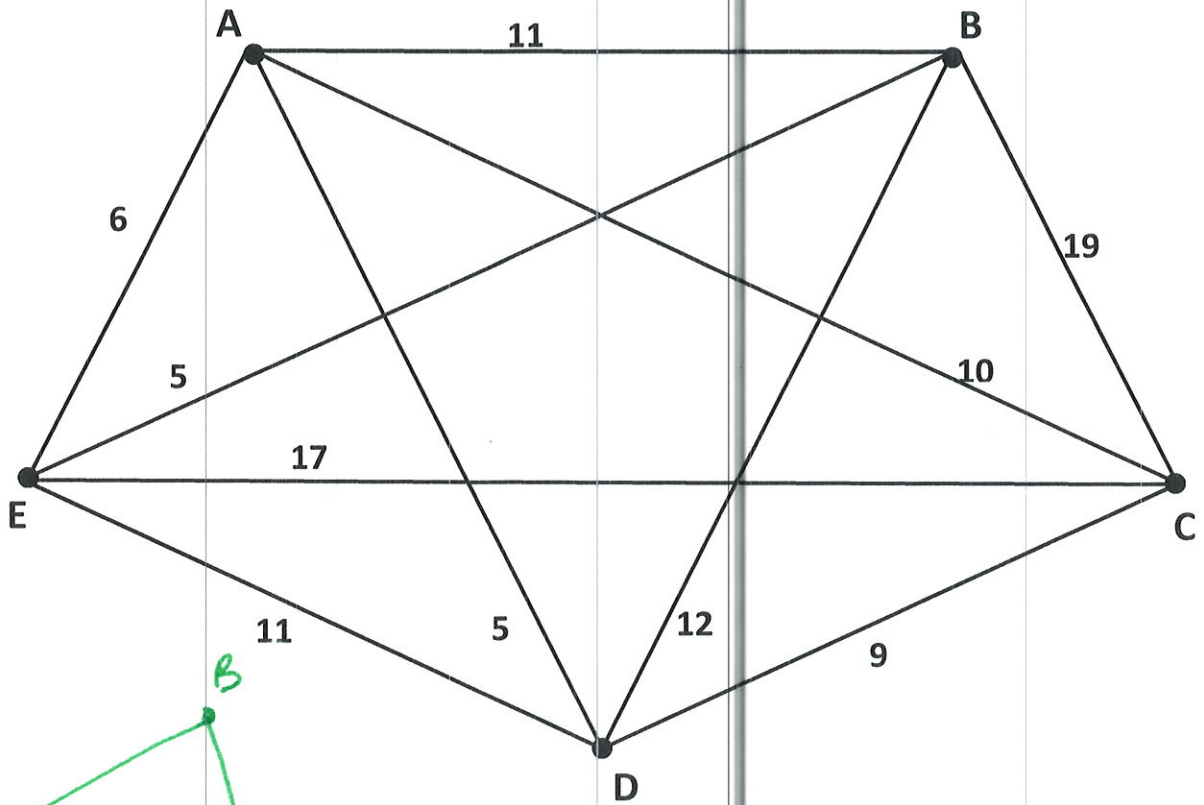
b. Nearest Neighbor starting at D



$$6 + 9 + 5 + 14 = 42$$



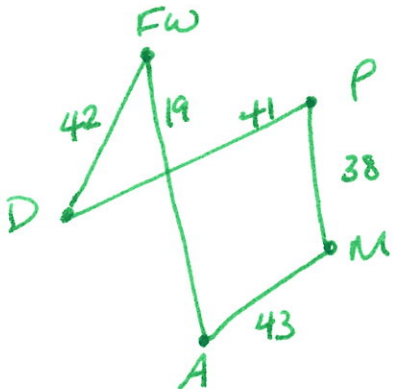
3. Use the Cheapest Link/Sorted Edges algorithm on the graph below to find the approximate minimal cost Hamilton Circuit. Clearly state the cost of the final circuit. (8 points)



$$5 + 5 + 6 + 9 + 19 = 44$$

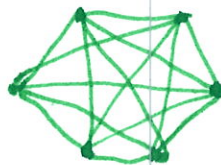
4. Use the mileage table shown below and the Nearest Neighbor algorithm starting from Plano to find the minimal cost Hamilton circuit for traveling between the cities in the table. Be sure to clearly state the final cost of the circuit. (8 points)

	Plano	Mesquite	Arlington	Denton
Fort Worth	54	52	19	42
Plano		38	53	41
Mesquite			43	56
Arlington				50



$$42 + 19 + 43 + 38 + 41 = 183$$

5. Draw a K_6 graph. (5 points)



6. Apportion the following table of an imaginary state legislature according to Hamilton's Method if there are 183 seats to be apportioned. (10 points)

STATE	POPULATION	STANDARD QUOTA	LOWER QUOTA	UPPER QUOTA	+1	FINAL APPORTIONMENT
TOGO	89,290	49.48	49	50	+1	50
IZUMI	97,974	54.29	54	55		54
SAKATA	59,597	33.02	33	34		33
OGURA	9,782	5.42	5	6		5
TOYAMA	25,742	14.26	14	15		14
KOISO	47,869	26.53	26	27	+1	27
TOTALS	30,254		181			183

$SD = 1804.67$

7. Apportion the following table of an imaginary state legislature according to Adams' Method if there are 183 seats to be apportioned. Suggested Modified Divisors are 1780, 1800, 1840. (10 points)

STATE	POPULATION	STANDARD QUOTA	MODIFIED QUOTA	MODIFIED QUOTA	MODIFIED QUOTA	FINAL APPORTIONMENT
TOGO	89,290	49.48	48.52			49
IZUMI	97,974	54.29	53.25			54
SAKATA	59,597	33.02	32.39			33
OGURA	9,782	5.42	5.32			6
TOYAMA	25,742	14.26	13.99			14
KOISO	47,869	26.53	26.02			27
TOTALS	330,254					183

$SD = 1804.67$