1. What is Doppler Principle? [5 points]

2. What kind of readings should you obtain from a motionless object in the RADAR beam? How would you explain such readings if they did occur? [5 points]

3. What are the three factors affect RADAR’s decision making? How do they work? [8 points]

4. Briefly discuss the factors that affect the operation of moving traffic radar. Are they avoidable? How? [10 points]

5. An experienced police officer parked his vehicle at the right lane of a two-lane (per direction) street and is monitoring speeds of vehicles coming from the opposite direction. The speed limit for this street is 35 mph. If the reading of his RADAR gun shows a forthcoming vehicle has a speed of 40 mph, can he conclude that the vehicle violated the speed limit? Why? If the distance between the police car and the target car is 100 feet and lane widths are 12 ft as shown in Figure 1, what is the ground truth speed of the target vehicle? [12 points]

![Figure 1. Locations of the vehicles when reading was obtained](image-url)