

**Automotive Electrical and Engine Performance 9th Edition**  
**Chapter 22 – Fuel-Injection Components and Operation**  
**Quiz A**

1. What determines the injector pulse width in a speed-density system?
  - a. Throttle position, engine RPM, and barometric pressure
  - b. Manifold pressure, engine RPM, and air temperature
  - c. Manifold pressure, engine RPM, and maximum RPM
  - d. Throttle position, intake air temperature, and oxygen sensor
  
2. Which component in an electronic returnless fuel system controls fuel pump operation?
  - a. Fuel pressure regulator
  - b. PCM using pulse-width modulation (PWM)
  - c. Throttle position sensor
  - d. Fuel temperature transducer
  
3. What is the primary purpose of a vacuum-biased fuel-pressure regulator?
  - a. To create equal pressure drop across injectors
  - b. To lower fuel consumption
  - c. To measure manifold pressure
  - d. To increase pulse width under load
  
4. In a mass airflow system, what sensor primarily influences injector pulse width modifications?
  - a. MAP sensor
  - b. O2 sensor
  - c. BARO sensor
  - d. MAF sensor

5. Which statement best describes the role of a fuel rail in a fuel-injection system?
- a. Dampens pressure pulsations from injectors
  - b. Increases the speed of fuel flow
  - c. Filters impurities from fuel
  - d. Acts as a reservoir for excess fuel
6. Which type of returnless fuel system employs a pressure control valve (PCV) to optimize injector pressure?
- a. Mechanical returnless
  - b. Demand delivery system
  - c. Electronic returnless
  - d. Closed-loop fuel injection
7. What feature of port fuel injectors minimizes fuel vaporization issues?
- a. Directional spray patterns
  - b. Low-pressure atomization
  - c. Rectangular fuel rails
  - d. Integral O-ring seals
8. Which mode of operation involves reducing injector pulse width or shutting it off during deceleration?
- a. Deceleration enleanment
  - b. Acceleration enrichment
  - c. Clear flood
  - d. Closed loop
9. What is the role of the idle air control (IAC) valve in a conventional system?
- a. Regulates throttle plate position
  - b. Controls airflow bypassing the throttle
  - c. Maintains equal pressure across the injectors
  - d. Reduces air intake at high RPM

10. Which design advantage does a stepper motor provide in fuel injection systems?

- a. Continuous, analog air control
- b. Higher voltage efficiency
- c. Accurate incremental position tracking by PCM
- d. Increased injector flow rates

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**Correct Answers:**

1. c
2. b
3. a
4. d
5. a
6. b
7. a
8. a
9. c
10. b