QUESTIONS - Fuel System

First & Last Name:

Using the information located in www.gwellwood.com/subjects/mechanics/fuel-system/, the internet, and other sources to answer the following questions.

There are no partial marks - when it says "describe" - *DESCRIBE*.

1. What are the two purposes of the fuel system?
   a.

   b.

2. How does a throttle plate control engine speed?

3. What is the difference between RICH and LEAN?

4. Is 15.4:1 RICH or LEAN?

5. Which type of fuel provides the WORST fuel economy?

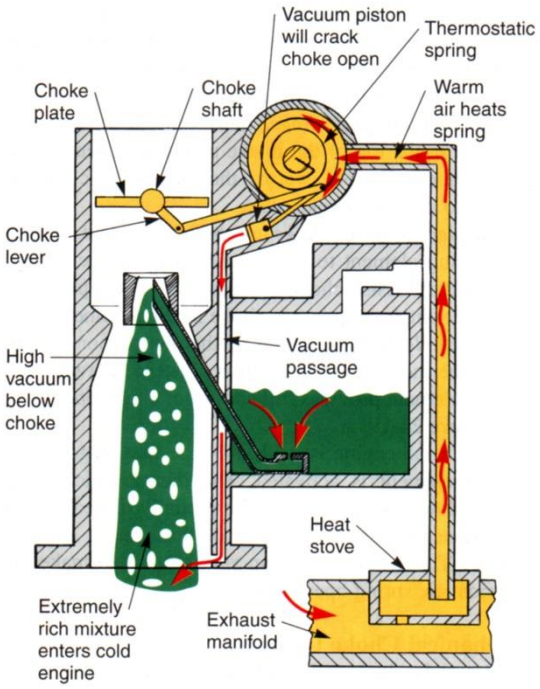
6. List the SIX different operating conditions:
    a. d.
    b. e.
    c. f.

7. DESCRIBE in your own words how a Diesel Engine runs:

8. DEFINE in your own words:
    a. Atomize
    b. Vapourize
    c. Rich
    d. Lean
    e. Stoichiometric
    f. Flood
    g. Throttle
    h. Choke
    i. Engine Vacuum
    j. Manifold Pressure

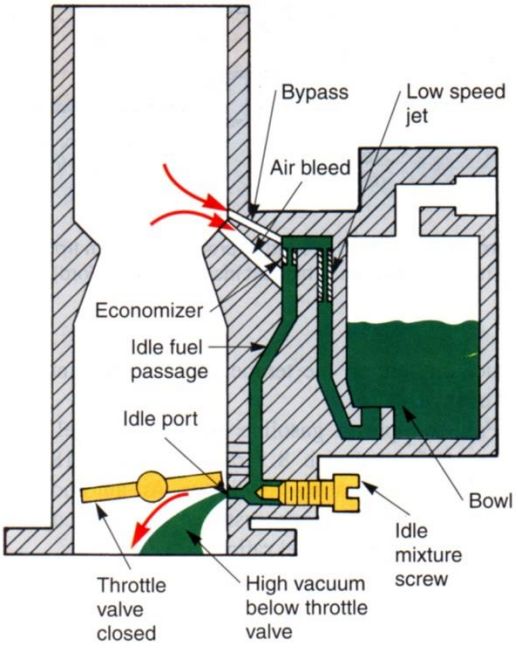
Six operating requirements for the fuel system.

9. What operation requirement is this carburetor performing?



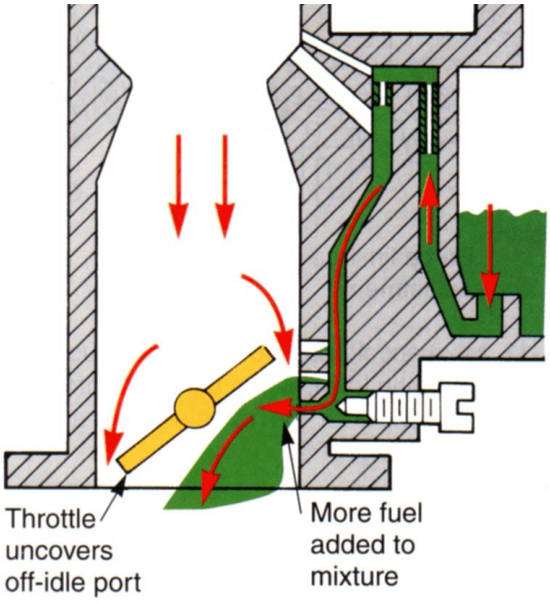
10. How is the fuel drawn into the air stream (Vacuum or Air Flow or Squirted)?

11. What operation requirement is this carburetor performing?



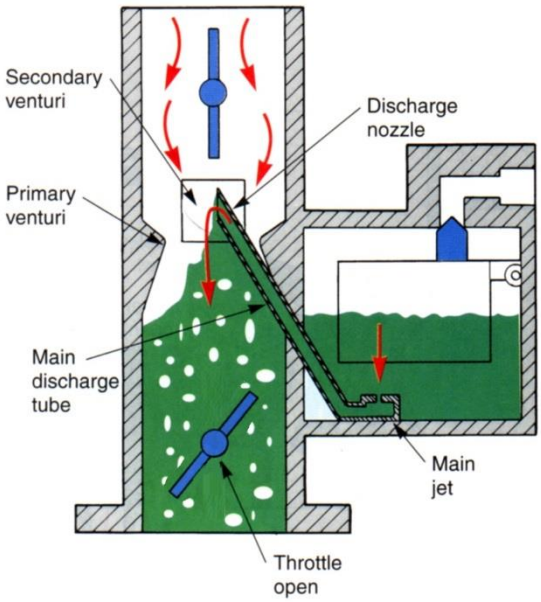
12. How is the fuel drawn into the air (Vacuum or Air Flow or Squirted)?

13. What operation requirement is this carburetor performing?



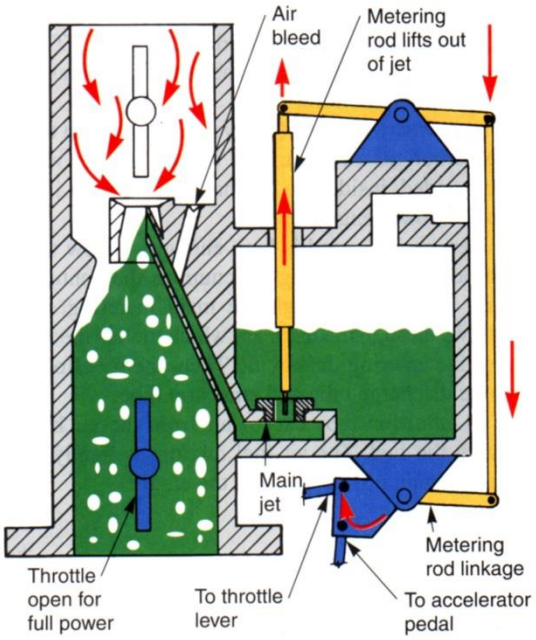
14. How is the fuel drawn into the air stream (Vacuum or Air Flow or Squirted)

15. What operation requirement is this carburetor performing?



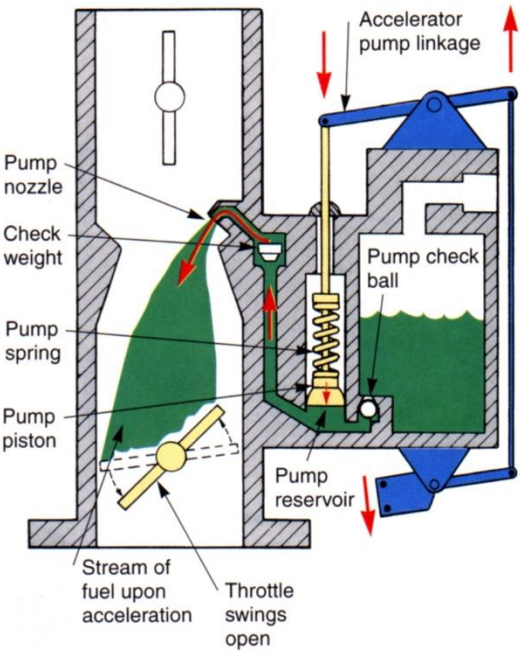
16. How is the fuel drawn into the air stream (Vacuum or Air Flow or Squirted)?

17. What operation requirement is this carburetor performing?



18. How is the fuel drawn into the air stream (Vacuum or Air Flow or Squirted)?

19. What operation requirement is this carburetor performing?



20. How is the fuel drawn into the air stream (Vacuum or Air Flow or Squirted)?

21. DESCRIBE in your own words how a Venturi works

22. What were two vehicles whose fuel tanks exploded in a collision? (I've owned both)
    a.

    b.

23. What are fuel lines typically made of?

24. How does a Mechanical Fuel Pump Work?

25. Electric Fuel Pumps MUST shut off in a collision if the engine quits – how do most manufacturers make sure the pump shuts off if the engine quits? (usually two specific ways – pick one)

FUEL INJECTION

26. There are seven basic sensors in a Fuel Injection system. What are they?
    a.

    b.

    c.

    d.

    e.

    f.

27. What does Electronic Fuel Injection System use to tell if it's cold outside?

28. What does Electronic Fuel Injection System use to tell if the engine is cold?

29. What does Electronic Fuel Injection System use to tell if you're suddenly moving the throttle?

30. What does Electronic Fuel Injection System use to tell what your engine speed is?

31. The Oxygen Sensor is the 9th wonder of the universe. DESCRIBE in your own words, WHY it is so awesome in EFI:

Complete the following Air/Fuel Ratio table:

	Throttle Position	Manifold Vacuum	Mass Air Flow	Engine Temperature	Mixture
Cold Start					
Idle					
Low Speed					
Cruise					
High Speed/Power					
Acceleration					

32. DEFINE in your own words the meaning of the term “Fuel Map”

33. DESCRIBE in your own words WHY a Malfunction Indicator Lamp (MIL) would light (I am NOT talking <u>specific</u> CODES or CAUSES. Hint: *Dating*)

34. A <u>fuel injected</u> engine does not seem to be <u>responding</u> to what the throttle is doing. What is the most likely cause?

35. An engine is “Surging” while cruising. What causes "surging?"

36. A Malfunction Indicator Lamp (MIL) comes on. The trouble code says a sensor is at fault. We test the sensor to make sure, and the sensor tests out fine (it is NOT the problem). Another "known good" sensor is installed, and it still doesn't fix the problem. Where would you look next?

37. A four cylinder fuel injected engine with **FIVE** injectors takes a very long time to start when cold, and runs poorly until warmed up. What is the most likely cause? (hint – when would a FOUR cylinder engine need a FIFTH injector????)

☐

38. A carbureted engine takes a very long time to start when cold, needing lots of pumping the gas pedal. What is the most likely cause? (What did you forget to do?)

☐

39. DEFINE using your own words:
    a. Open Loop

    b. Closed Loop

    c. Injector Pulse Width

40. VIDEO QUESTION (Replace Fuel Filter): What happens if you don't change the fuel filter on a regular basis?

41. VIDEO QUESTION (Replace Air Filter): Describe how to replace the air filter: