

R5 North Zone Engine Academy
Pre-Work – (65 pts)

1. Name the following valve numbers and functions of each, found on engines, as found in the 2003 Water Handling and Equipment Guide: (19 pts) Be specific.

Valve #	Name	Function
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

2. To pump water through a 1-1/2” line from a pond to a fire, what valves must be opened. (1 pt)

3. To keep a Forest Service engine with a full tank of water ready during freezing weather, which valve/valves should be closed? (1 pt)

4. How many inches of vacuum are necessary to lift water six feet? (1 pt)

5. A Model 62 engine has a: (1 pt)

- A. Single Stage Positive Displacement Pump
- B. Two-Stage Centrifugal Pump
- C. Four-Stage Centrifugal Pump
- D. Three-Stage Positive Displacement Pump

6. A positive displacement pump should have a pressure relief valve. (1 pt)

- A. TRUE
- B. FALSE

7. What do the following abbreviations mean? (5 pts)

GVWR – _____

NPSH – _____

NH – _____

GPM – _____

PSI – _____

8. When testing fire hose, the total length of each line tested shall not exceed: (1 pt)

9. When drafting with a Model 62, what is the *primary* reason for not using 2 1/2" hard suction hose? (1 pt)

- A. Volute
- B. Elevation
- C. Cavitation
- D. Water Depth

10. How many gallons of water are contained in a 100 ft. section of 1-1/2" hose? (1 pt)

11. Three PSI will lift water _____ feet. (1 pt)

12. Explain friction loss. (1 pt)

13. What is the atmospheric pressure at sea level on a standard day? (1pt)

14. Friction loss decreases as flow (GPM) _____. (1 pt)

15. When drafting from a stream, the suction screen should be deep enough to maintain a prime. (1 pt)

- A. TRUE B. FALSE

16. Which of the following conditions can cause cavitation in a pump? (1 pt)

- A. Rising water temperature in your pump
- B. A blocked or inadequate suction strainer
- C. Using too small or too long a suction hose
- D. All of the above

17. According to the NWCG National Incident Operations Driving Standard, multiple drivers can drive up to the duty day limitation as long as no single driver exceeds ____ hours behind the wheel. (1 pt)

18. After off-road driving, it is advisable to check for rocks between the duals and for possible tire sidewall damage. (1 pt)

- A. TRUE B. FALSE

19. Which of the following are types of driver distractions? (1 pt)

- A. Visual—eyes off the road
- B. Cognitive—mind off the road
- C. Manual—hands off the steering wheel
- D. All of the above

20. You, as an operator, can mitigate minor maintenance/repair issues as allowed by your supervisor. (1 pt)

- A. TRUE B. FALSE

21. It is the responsibility of the _____ to ensure that the piece of fire equipment that they are assigned to is safe and ready to respond in an emergency. (1 pt)

22. _____ systems are designed to provide improved vehicle stability by reducing wheel lock or wheel slip during conditions of aggressive braking or impaired traction. (1 pt)

- A. Anti-Compounding
- B. Automatic Transmission
- C. Cruise Control
- D. Secondary Braking
- E. Anti-Lock Braking

23. Match the four strokes of the diesel process to their appropriate definitions... (4 pts)

- 1. Intake Stroke
- 2. Compression Stroke
- 3. Combustion / Power Stroke
- 4. Exhaust Stroke

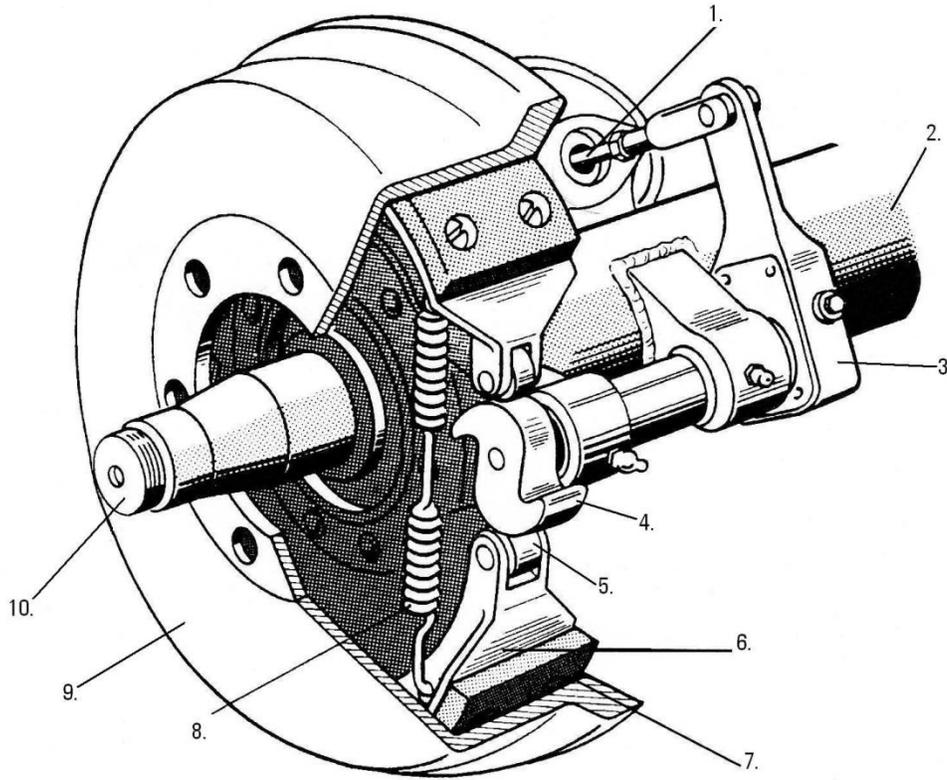
_____ The piston has reached the top, fuel is injected at just the right moment and ignites, forcing the piston down

_____ A valve opens up, letting clean air in as the piston moves down

_____ A valve opens and as the piston moves to the top, exhaust that was created from combustion is forced out

_____ Piston moves up and pressurizes the air in the chamber

24. Identify the parts of the air brake system in the following picture. (10 pts)



- 1. _____
- 3. _____
- 5. _____
- 7. _____
- 9. _____

- 2. _____
- 4. _____
- 6. _____
- 8. _____
- 10. _____

25. Name 4 of the fluid levels that need to be checked under the hood on a PM inspection. (4 pts)

- 1. _____
- 2. _____
- 3. _____
- 4. _____

26. Why do you periodically need to drain your air tanks? (1 pt)
- A. It sounds really cool.
 - B. It is a way to ensure your air compressor is in good working order.
 - C. It takes more 'old' air to activate the braking system than 'fresh' air.
 - D. To keep the tanks clear of contaminants and condensation.
27. As drivers, our ability to manage risk is dependent on a number of factors including: _____, judgment and impairment. (1 pt)
- A. Height
 - B. Age
 - C. Experience
 - D. Position
28. On a green arrow, you must: (1 pt)
- A. Yield to any vehicle, bicycle, or pedestrian
 - B. Yield to pedestrians only in the intersection
 - C. Wait 4 seconds before proceeding