MATH WORK SHEET

(Be able to work these types of problems for the math section of the exam)

Note: *Formulas will be provided for exam.*

Septic Tank Dimensions

Inside of Tank
Length 102”
Width 57”
Inside bottom of tank to outlet flow line 44”

Outside of Tank
Length 108”
Width 63”
Height 66”
Bottom of tank to inlet flow line 51”
Bottom of tank to outlet flow line 48”

D-Box Dimensions (Distribution Box)

Outside of D-Box
Depth 15”
Bottom of D-Box to inlet flow line 6”
Bottom of D-Box to outlet flow lines 4”

Absorption Trench Dimensions
Rock and Pipe Configuration
24” Wide x 18” Deep

Inlet Tee - a.k.a. Sanitary Tee or Baffle
Outlet Tee - a.k.a Sanitary Tee or Baffle

***All “elevation” references are to be considered “rod readings”.**

1. What is the depth, in inches, of a septic tank hole, if the top of the tank is to be at ground level?
   Note: On this tank hole, you will have to add 2” of gravel for bedding the tank.

2. What is the depth, in inches, of the septic tank hole, if the outlet flow line is at ground level?
   Note: On this tank hole, you must add 1” of gravel for bedding the tank.

3. What is the minimum inlet tee’s length? (Measured from the tee’s flow line)
   ***Remember the inlet tee should extend at least 6 inches below the liquid level in the tank.**

4. What would be the range (minimum/maximum) for outlet tee lengths? (Measured from the tee’s flow line)
   ***Remember outlet tees should extend to a distance below the surface 35 to 45 percent of the liquid depth of the tank.**

5. What is the liquid volume in gallons of this septic tank?

6. If the liquid level in this tank drops one inch, how many gallons are lost?

7. The ground elevation at Field Line 1 is 3.25 feet, what is the trench bottom elevation in tenths?

8. In order to obtain maximum storage for field line 1 referenced in problem 7, what is the minimum elevation for the outlet of the D-Box flow line?
   Note: The field line site is on a 10% slope.

9. The elevation of the sewer stub-out flow line is 1’10” (1 foot 10 inches), what is the maximum allowable elevation reading at the septic tank inlet flow line with the tank being 10 feet from the stub-out?

(Answers on the following page)

Answers to Math Work Sheet problems:

1. 68”
2. 49”
3. 9”
4. 15.4 inches to 19.8 inches or 15 3/8 inches to 19 7/8 inches
5. 1107.43 gallons
6. 25.17 gallons
7. 4.75 feet
8. 3.25 feet
9. 2’ ½” (2 feet ½ inch)

To solve:

Problem 1, Use Outside of Tank, Height 66” + 2” of gravel = 68”

Problem 2, Use Outside of Tank, Bottom of tank to Outlet flow line 48” + 1” of gravel = 49”

Problem 3, Use Outside of Tank, Bottom of tank to Inlet flow line and Outlet flow line 51”- 48” = 3” difference.
Add the require 6” into liquid level 6” + 3” = 9”

Problem 4, Use **Inside** of Tank, Bottom of tank to Outlet flow line 44”
Convert 35% to decimal form 35/100 = 0.35 Next Step, 44” x 0.35 = 15.4”
Convert 45% to decimal form 45/100 = 0.45 Next Step, 44” x 0.45 = 19.8”
Outlet tee length range (15.4” to 19.8”), as an example, an outlet tee 17” long, would be acceptable.

Problem 5, Use **Inside** Tank Length, Width and Liquid Depth

$$\frac{102 \text{ in} \times 57 \text{ in} \times 44 \text{ in}}{231 \text{ in}^3/\text{gallon}} = \frac{255816 \text{ in}^3}{231 \text{ in}^3/\text{gallon}} = 1107.43 \text{ gallons}$$

Problem 6, Use **Inside** Tank Length, Width and Depth of 1”

$$\frac{102 \text{ in} \times 57 \text{ in} \times 1 \text{ in}}{231 \text{ in}^3/\text{gallon}} = \frac{5814 \text{ in}^3}{231 \text{ in}^3/\text{gallon}} = 25.17 \text{ gallons}$$

Problem 7, Convert 18” (Trench Depth) into tenths 18 ÷ 12 = 1.5
Add to 3.25 (Ground Elevation of line 1) 3.25 + 1.5 = 4.75

Problem 8,
On sloping ground to achieve maximum storage for line 1, the outlet flow line of the Distribution box must be at or above the ground elevation of line 1. The ground elevation of line 1 is 3.25 feet.

Problem 9, Using 4 inch Schedule 40 solid pipe, follow the 1/8 to 1/4 inch fall per foot from the sewer stub-out to the inlet of the septic tank.
Convert 1/4” to decimal form 1÷ 4 = 0.25” Multiply 0.25 by 10 feet (distance tank is from house) 0.25” x 10 = 2.5”
Add to 1’10” (Stub-Out flow line elevation) 1’10” + 2.5” = 2’ ½”