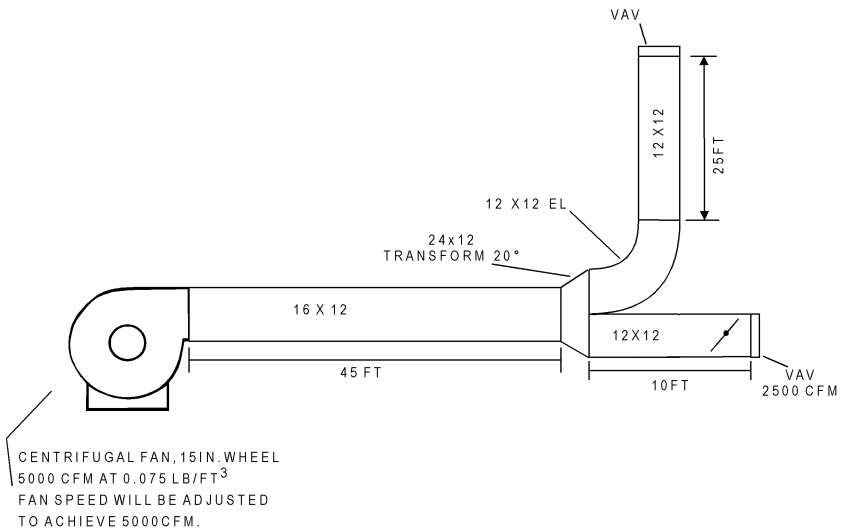
Skill Development Exercises for Chapter 7

7-1. As depicted in the figure below, this system consists of a fan, ductwork and outlets. The duct is the same size as the fan outlet, so no system effect factor needs to be added. The outlets are VAV boxes with a 1 in. wg pressure drop at 2,500 cfm. The fan speed will be adjusted to deliver 5,000 cfm. The C_o value of the elbow is 0.2. What is the total pressure drop in the system?

a) 3.2 in. wg b) 1.8 in. wg c) 1.6 in. wg d) None of the above



Answer: a

45-ft duct	0.585
Transition	0.300
Elbow	0.089
25-ft duct	0.188
VAV box & outlet	1.000
Fan outlet velocity pressure	1.006
Total	3.168 (report as 3.2)

7-2. Air duct system design must consider:

a) Noise b) Duct leakage, heat gains and heat losses

c) Fire and smoke control d) All of the above e) None of the above

Answer: d

7-3. Duct sizing and construction specifications are generally stated in terms of the use of:

a) Galvanized steel b) Aluminum c) Fiberglass reinforced plastic

d) All of the above e) None of the above

Answer: a

7-4. Generally the most efficient and economical ducts for air systems are:

a) Rectangular b) Oval c) Round

d) All of the above e) None of the above

Answer: c

7-5. Duct systems of rectangular fibrous glass are generally limited to:

a) 2,400 fpm and ±2 in. wg b) 4,000 fpm and ±3 in. wg

c) 1,000 fpm and ±3 in. wg d) None of the above

Answer: a

7-6. Compression of flexible ducts significantly decreases air flow resistance.

a) True b) False

c) Cannot be determined from the information given

Answer: b, False

7-7. Sealant systems have been developed that can substitute for mechanical joining of ductwork.

a) True b) False

Answer: b, False