Skill Development Exercises for Chapter 10

10-1. Fundamentals of sound important to the HVAC designer include:

a) Sound pressure levels in occupied spaces

b) Sound power levels produced by equipment

c) Sound intensity in supply and return sound paths

d) All of the above e) a and b above

Answer: e

Sound intensity is the sound power passing through a RMS meter. In the supply and return paths, you should be concerned with sound power levels in the range of frequency bands.

10-2. The audible frequency range extends from about:

a) 20 kHz to 20 MHz b) 2 Hz to 20 Hz

c) 20 Hz to 20 kHz d) None of the above

Answer: c

10-3. Typically, the cost of preventing sound and vibration problems in an HVAC system is approximately _____ of the total system cost.

a) 3% b) 2% c) 1% d) None of the above

Answer: c

One percent is tiny compared to the possible cost of remediation and occupant dissatisfaction.

10-4. A mechanical room housing a fan or AHU with an unducted intake should have a floor area of _____ for each 1,000 cfm of air flow.

a) 2 to 4 ft^2 b) 5 to 7.5 ft^2 c) 7 to 10 ft^2 d) None of the above

Answer: d

About 10-15 ft^2 should be provided per 1000 cfm for unducted intakes.

10-5. All HVAC equipment rooms should have a floor area large enough to allow a clearance of at least _____ feet around all equipment.

a) 1.0 b) 1.5 c) 2.0 d) None of the above

Answer: c

However, local codes may require more clearance.

10-6. Sound-absorbing material can be arranged in a duct system by:

a) Lining fan suction and discharge plenums

b) Lining ducts with sound-absorbing material

c) Lining duct sections close to elbows

d) All of the above

Answer: d

10-7. Duct silencers should be located _____ duct diameters for every 1,000 fpm from fan discharges.

a) 0.1 b) 0.5 c) 1.0 d) None of the above

Answer: c

1.0 duct diameter for every 1000 fpm mean air velocity out of the supply fan

10-8. Resonant silencers are often used in medical facilities where biological decontamination may be required.

a) False b) True

Answer: b

Resonant filters contain no porous materials, which minimizes collection of contaminants and allows for disinfection.

10-9. Choosing a silencer is dependent on:

a) air resistance b) regenerated noise c) space availability

d) attenuation e) all of the above

Answer: e

10-10. Advantages of round duct are its inherent resistance to vibration and sound break-out.

a) True b) False

Answer: a