Question

1. The noise from a single jet engine at some distance from a receiver measures 120 dB. At the same location, would you expect the noise from two such jet engines to measure:

   a. 240 dB
   b. 60 dB
   c. 123 dB

   Hint: ESDU 66017 shows you how to calculate the combined sound pressure level from two or more sources of known levels.

Answer: c

Question

2. A noise source has a continuous spectral distribution with a small rate of change of level with frequency. You know that at the discrete frequency of 4 kHz the noise level is 100dB. In the one-third octave band centred on 4 kHz would you expect the level to be:

   a. 100 dB
   b. 130 dB
   c. 50 dB

   Hint: ESDU 66016 gives the relationship between the spectrum level at a particular frequency and the level in a band of known width centred on that frequency.

Answer: b

Question

3. Jet mixing noise increases with jet velocity. Which option below describes the relation between noise and velocity ?

   a. Linear
   b. Noise varies with the square of the velocity
   c. Noise varies with the 8^{th} power of velocity

   Hint: See ESDU 02020

Answer: c.

Question

4. A coaxial jet engine is quieter than a single-stream jet engine. Is that

a. True
b. False

Hint: See ESDU 02020

Answer

a. True.

Question

5. A high-bypass ratio jet engine is noisier than a low-bypass ratio engine. Is that

   a. True
   b. False

   Hint: ESDU 11002 allows the user to estimate coaxial jet noise.

Answer

b. False. The higher the bypass ratio, the lower is the mixed jet velocity. So, the noise is lower.

Question
6. Sound propagates in an identical manner whether the receiver is close to the jet in the near-field or far from the jet in the far-field. Is that
a. True
b. False
Hint: ESDU 99006 allows the user to predict near-field single-stream jet noise.

Answer
b. False. Sound propagation in the near-field is quite different from that in the far-field.

Question
7. Leaving aside power plant noise, which configuration would you expect to be quieter
a. Landing configuration with undercarriage lowered, slats extended and flaps down
b. Cruise configuration
Hint: ESDU 90023 allows the user to estimate the contribution of different elements of the airframe to the total noise.

Answer
b. Cruise configuration.

Question
8. As sound propagates, the sound level at a reception point varies. Which of the factors below determine the manner of variation ?
a. Reciprocal spreading
b. Atmospheric absorption
c. Ground reflection
d. All of the above
Hint: See ESDU 78002, 78003, 94035 and 94036

Answer
d. All of the above..

Question
9. Compared with constant air temperature as a function of height, if air temperature increased as you went higher above the ground, would you expect the sound level at a reception point a given distance from a sound source to
a. remain the same
b. be lower
c. be higher
Hint: See ESDU 04011
Answer
c. be higher. A positive temperature gradient would, in general, amplify the sound..

Question
10. Compared with constant wind speed as a function of height, if wind speed increased with height above the ground, would you expect the sound level at a reception point a given distance from a sound source to
a. remain the same
b. be lower
c. be higher
Hint: See ESDU 04011

Answer
c. be higher. A positive wind speed gradient would, in general, amplify the sound..