

M503 – Answers to Overnight Questions Day 4

Question 1:

An audiometric test should measure the worker's thresholds at the following frequencies:

- ☐ 125 Hz, 250 Hz, 500 Hz, 750 Hz, 1000 Hz, 1500 Hz, and 2000 Hz
- ☒ 0.5 kHz, 1 kHz, 2 kHz, 3 kHz, 4 kHz, 6 kHz and 8 kHz
- ☐ All octave bands in the range of human hearing
- ☐ 1000 Hz, 2000 Hz, 4000 Hz, 8000 Hz, 16000 Hz
- ☐ 500kHz, 1000kHz, 2000kHz, 3000kHz, 4000kHz, 6000kHz and 8000kHz

Question 2:

Which employees should be included in the annual audiometric monitoring program?

- ☐ All employees exposed above 70 dBA SPL.
- ☒ All employees exposed above 85 dBA SPL.
- ☐ All employees exposed above 85 dBA L_{EX8h}
- ☐ Only employees who work full time.
- ☐ All visitors who enter a noisy environment.

Question 3:

The purpose of the audiometric test is:

- ☐ To identify employees who need hearing protection
- ☐ To minimize employer liability for hearing loss
- ☐ To avoid fines from government inspections
- ☒ To identify employees with a temporary shift in hearing due to noise exposure
- ☐ To collect the evidence of worker's hearing loss

Question 4:

Hearing loss due to noise exposure affects the following frequencies first:

- ☐ 500 Hz, 1000 Hz, and 2000 Hz
- ☐ 1000 Hz, 2000 Hz, and 3000 Hz
- ☒ 3000 Hz, 4000 Hz, and 6000 Hz
- ☐ 4000 Hz, 6000 Hz, and 8000 Hz
- ☐ Noise affects all frequencies

Question 5:

The best time to conduct an annual test is:

- Any time during the work shift
- ☐ After the employee has been away from work for 14 hours
- ☐ After the employee has been away from noise for 24 hours
- ☐ Within 6 months of the baseline test
- ☐ 18 months after the baseline test

Question 6:

A retest should be done:

- ☐ if the audiogram shows a hearing loss
- ☐ if the right ear is worse than the left ear
- ☐ only if there has been improvement in hearing
- when the test shows a significant threshold shift compared to the baseline test
- ☐ if the test results are 5 dB worse than the baseline test at every frequency.

Question 7:

The audiometric monitoring component of the hearing conservation program:

- Allows hearing loss to be reported from the air conduction measurements.
- ☐ Separates the occupational and nonoccupational noise exposure.
- ☐ Can be used to easily distinguish NIHL from age related hearing loss.
- ☐ Is the same for every employee who is exposed the same noise.
- ☐ Will diagnose balance problems due to damage in the inner ear.
- ☐ None of the above

Question 8:

Noise-induced hearing loss:

- ☐ Is a conductive type of hearing loss
- ☐ Affects the low frequencies
- Has a classic noise "notch" pattern typically at 4000 Hz
- ☐ Will improve once the employee starts using hearing protection
- ☐ Always affects both ears exactly the same way.

Question 9:

The audiometric headphone in the right ear is intermittent.

What should the audiometric technician do?

- ☐ Keep testing, but ask the employee to hold the headphone cord in the right position so the sound is audible
- ☐ Borrow another set of headphones from a different audiometer and keep testing
- Replace the headphone cord. Do a listening check and a daily calibration check. If OK, resume testing.
- ☐ Quit testing until the annual calibration is due. When the authorized person comes to calibrate, have the equipment repaired.
- ☐ Keep testing and hope that the problem will go away.

Question 10:

The hearing test results obtained in occupational hearing conservation programs show:

➤ **air conduction thresholds**

- ☐ the loudest sound the employee can hear
- ☐ the whole frequency range the employee can hear
- ☐ the cause of the hearing loss
- ☐ how well the worker understands speech

Question 11:

The spectrum for a noise source has been measured at the operator's ear and is given below. Plugs and muffs are currently available for the operator. Check if either provides adequate protection for this situation.

Noise source

Frequency, Hz	125	250	500	1000	2000	4000	8000
Source, dB	103	102	104	99	94	96	89

Protector Classic Plugs

Frequency, Hz	125	250	500	1000	2000	4000	8000
Mean Atten	22.0	22.8	23.6	24.3	32.5	40.3	37.6
Std Dev	9.8	8.8	9.2	7.7	6.6	5.2	7.0

General Purpose Muffs

Frequency, Hz	125	250	500	1000	2000	4000	8000
Mean Atten	15.4	19.4	28.0	33.8	33.8	37.3	40.1
Std Dev	3.1	3.0	2.4	5.5	2.0	4.1	4.2

By calculation in ear level with the plugs was 89 dBA.

And with the muffs was 81 dBA.

Muffs should therefore be recommended.

Question 12:

An employee works in two main areas during each week. The noise levels for the various tasks have been measured and the typical time periods estimated.

Determine the occupational noise exposure for this employee and give general recommendations on a noise management plan.

- Monday, Wednesday and Friday in engine bay area
 - Working on engine for 3.3 hrs 90 dB(A)
 - Working near compressor 1.7 hrs 84 dB(A)
 - General activities 2 hrs 75dB(A)
 - Lunch/breaks 1 hour 60 dB(A)

- Tuesday and Thursday in mechanical workshop

Rough grinding for	30min	98 dB(A)
Angle grinding for	30 min	102 dB(A)
Smooth grinding for	1 hour	86 dB(A)
Bandsaw for	1 hour	97 dB(A)
Cut-off saw for	2 hours	87 dB(A)
General activities	2 hrs	80 dB(A)
Lunch/breaks	1 hour	60 dB(A)

ANSWER 12

Operation Mon Wed Fri	Level dB(A)	Hours
Engine	90	3.3
Compressor	84	1.7
General Activities	75	2
Breaks	60	1
Operation Tues Thurs	Level dB(A)	Hours
Rough Grinding	98	0.5
Angle Grinding	102	0.5
Smooth Grinding	86	1
Band Saw	97	1
Cut off Saw	87	2
General Activities	80	2
Lunch & Breaks	60	1

Total Hours	L_{Aeq8h}
8	86.8

Total Hours	L_{Aeq8h}
8	93.4

Convert each day to Pa^2h

86.8 gives $0.19 Pa^2$ by 8hours gives $1.52 Pa^2h$

93.4 gives $0.98 Pa^2$ by 8hours gives $7.84 Pa^2h$

Add the days together for the weekly total

Monday	1.52
Tuesday	7.84
Wednesday	1.52
Thursday	7.84
Friday	1.52
TOTAL	20.24

Divide by five (5) for one day 4.06

Convert to $L_{Aeq,8h}$ 91 dBA approx by tables and 90.7dBA which rounds off the 91 dBA by calculation