Comfortable and Healthy Indoor Climate EEN-E4001

Exercise 6 for Lecture 6/2019

Return date 13.2.2019

1.   Which absorption coefficient is necessary for the ceiling to achieve a reverberation time equal to 0.7 seconds in a classroom ? The dimension of classroom is 15 x 8 x 3 (H) m^3. The door area is 2 m^2 and window 12 m^2.

Surface	$0 < \alpha < 1$
Floor	0.04
Window	0.03
Door	0.08
Walls	0.02

2.   The exhaust fan generates noise L_{WA}= 79 dB(A). What is the sound pressure (L_p) 5 m from the fan at the roof ? How much is the pressure level 20 m from the exhaust fan ?

3.   The sound pressure level of an exhaust valve is 35 dB(A) in the room where the absorption area is 4 m^2. What the sound pressure if the absorption area is only 1 m^2?

4.   What is the sound pressure level at 4 m distance from exhaust and supply valves that are installed in the same wall near to the ceiling ?

The noise through supply and exhaust ducts to room are 31 dB and 32 dB. Noise generation of the supply and exhaust valves are 33 dB and 34 dB. The absorption are of the room is 10 m^2.

5.   Calculate the A-weighted sound pressure level in the technical room where the chiller's noise and sound attention of the room are described in the table below.

	frequency, Hz						
	125	250	500	1 000	2 000	4 000	8 000
L_w, dB	79	84	89	93	94	87	79
Sound attention of the room, dB	7	7	6	4	4	5	6