Unit 4 - Week 3

Revised Assignment 3

The due date for submitting this assignment has passed. Due on 2016-08-13, 23:30 IST.

Submitted assignment

A room has dimensions 8 m x 16 m x 10 m and average absorptivity of the surfaces is $a = 0.5$. If a $5 \times 10^4$ W average output acoustic source is placed in the front wall. [Where $\rho = 1.21 \text{ kg/m}^3$ and $c = 343 \text{ m/s}$] (Data for question no. 1 to 4)

1) Calculate the steady state reverberant sound pressure level (SPL) in dB.

- (a) Range of 18 dB to 20 dB
- (b) Range of 21 dB to 25 dB
- (c) Range of 26 dB to 30 dB
- (d) Range of 31 dB to 35 dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (c) Range of 26 dB to 30 dB

2) The total power in dB at a distance of 5 m from the source

- (a) Range of 22 dB to 24 dB
- (b) Range of 24.01 dB to 26 dB
- (c) Range of 26.01 dB to 28 dB
- (d) Range of 28.01 dB to 30 dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (d) Range of 28.01 dB to 30 dB

3) The critical distance of the room

- (a) Range of 1.1 m to 2.0 m
- (b) Range of 2.1 m to 3.0 m
- (c) Range of 3.1 m to 4.0 m
- (d) Range of 4.1 m to 5.0 m

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (c) Range of 3.1 m to 4.0 m
If the room absorptivity Change to **800 Sabin’s. What is the change in reverberant sound power in dB?**

- (a) Range of 1.0 dB to 2.0 dB
- (b) Range of 2.1 dB to 4.0 dB
- (c) Range of 4.1 dB to 6.0 dB
- (d) Range of 6.1 dB to 8.0 dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b) Range of 2.1 dB to 4.0 dB

A room has dimensions 12 m x 16 m x 10 m and average absorptivity of the surfaces is a = 0.4 (Data for question no. 5 to 7)

5) Is the volume of the room is sufficient for large room acoustic for speech system?

- (a) Yes
- (b) No

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a) Yes

6) Find out the total number of reflection during \( RT_{60} \)

- (a) 32 Nos
- (b) 34 Nos
- (c) 36 Nos
- (d) 38 Nos

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b) 34 Nos

7) If two loudspeakers are placed in the front wall find out the %ALCONS at 3 m

- (a) 1.15%
- (b) 1.75%
- (c) 2.25%
- (d) 2.75%

No, the answer is incorrect.
Score: 0
Accepte Answers:
(a) 1.15%

8) If an acoustic room has the dimension 12 m x 14 m x 6 m find out lowest 2 axial standing wave frequencies? [where \( c = 343 \text{ m/s} \)]
9) An auditorium has the following specification. Design the auditorium acoustic treatment by selecting proper material from the table-1 in proper position. Calculate the reverberation time of the auditorium when 70% seat is full.

Total number of Seat =160
Approximate acoustic volume=723.9 m³

The area of different part is as given below

<table>
<thead>
<tr>
<th>S/l</th>
<th>Location</th>
<th>Quantity</th>
<th>Write the material name</th>
<th>Absorption in Sabin s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People on Upholstered seat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vacant Seat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Wall in diffusive module and space between modules and ceiling</td>
<td>17.48 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Area of floor without seat</td>
<td>104.18 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rear interior wall</td>
<td>45.33 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rear ceiling</td>
<td>31 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Absorptive ceiling on the side wall</td>
<td>37.50 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ceiling reflectors</td>
<td>144.96 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Stage front wall</td>
<td>19.15 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Diffusive side wall</td>
<td>52.08 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stage floor</td>
<td>38.10 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Stage side wall</td>
<td>36.40 m²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-1

<table>
<thead>
<tr>
<th>S/l</th>
<th>Material</th>
<th>Absorption coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People on Upholstered seat</td>
<td>0.4</td>
</tr>
<tr>
<td>2</td>
<td>Vacant Seat</td>
<td>0.3</td>
</tr>
<tr>
<td>3</td>
<td>Wood fiber board</td>
<td>0.75</td>
</tr>
<tr>
<td>4</td>
<td>Acoustic blanket</td>
<td>0.80</td>
</tr>
<tr>
<td>5</td>
<td>Cork with fabric cover</td>
<td>0.4</td>
</tr>
<tr>
<td>6</td>
<td>Carpet</td>
<td>0.4</td>
</tr>
<tr>
<td>7</td>
<td>Fiber cement board</td>
<td>0.05</td>
</tr>
<tr>
<td>8</td>
<td>Hard wood</td>
<td>0.10</td>
</tr>
<tr>
<td>9</td>
<td>Painted concrete</td>
<td>0.06</td>
</tr>
</tbody>
</table>

(a) Range of 0 sec to 1 sec
(b) Range of 1.1 sec to 2 sec
(c) Range of 2.1 sec to 2.5 sec
(d) Range of 2.6 sec to 3 sec

No, the answer is incorrect.
Score: 0
Accepted Answers:

(a) Range of 0 sec to 1 sec