Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14MT2029** | **Duration :** | **3hrs** |
| **Sub. Name :** | **STUDIO ACOUSTICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Write short notes on:   1. Cock Tail party effect. 2. Law of the first wavefront. 3. Presedence effect. 4. Bianural Loacalization of sound. | CO3 | 20 |
| (OR) | | | | |
| 2. |  | A seat in a concert hall is 84 ft from the tympani. The tympanist strikes a single note. The sound-pressure level of the direct sound of the note at the seat is measured to be 55 dB. The first reflection from the nearest sidewall arrives at the seat 105 msec after the arrival of the direct sound.   1. How far does the reflection travel to reach the seat? 2. What is the SPL of the reflection at the seat, assuming perfect reflection at the wall? 3. How long will the reflection be delayed after arrival of the direct sound at the seat? | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | Calculate the average RT60 for a room with the given specifications:  Dimensions: 20ft X 15ft X 10ft  Treatment: Ceiling – Acoustic Tiles  Flooring – wood  Two adjacent walls – Gypsum board: ½ inch  Other walls – Concrete block, coarse  The Absorption coefficients are given for each material as below:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Material** | **125Hz** | **250Hz** | **500Hz** | **1kHz** | **2kHz** | **4kHz** | | **Gypsum Board: 1/2inch** | 0.29 | 0.10 | 0.05 | 0.04 | 0.07 | 0.09 | | **Wood** | 0.15 | 0.11 | 0.10 | 0.07 | 0.06 | 0.07 | | **Acoustic Tiles** | 0.07 | 0.21 | 0.66 | 0.75 | 0.62 | 0.49 | | **Concrete block, coarse** | 0.36 | 0.44 | 0.31 | 0.29 | 0.39 | 0.25 | | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Write short notes on 3 methods used for absorption coefficient calculation. | CO1 | 12 |
|  | b. | Discuss briefly upon Effect of thickness, Airspace and Density of absorbent materials upon the absorbent coefficient of a material. | CO1 | 8 |
|  |  |  |  |  |
| 5. |  | Calculate the lowest 10 Modal Resonance Frequencies in a room with Length (L): 12.46ft, Width(W): 11.42ft and Height (H): 7.90ft. | CO3 | 20 |
| (OR) | | | | |
| 6. |  | Discuss the absorption characteristics of the following materials in detail:   1. Glasswool 2. Foam 3. Plywood 4. Acoustic tiles 5. Panel boards | CO1 | 20 |
|  |  |  |  |  |
| 7. |  | Design a Schroeder’s one dimensional diffusers with prime number 11. Draw the elevation of the prime number quadratic residue based well depths and mention the frequency range that would be diffused by the panel if the dimensions of the depths of 1 unit would 1m. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | If you are given a 200sq feet area room in an Academic institution to be made into a studio what measures will you take before building the studio? Also suggest with a neat diagram a plan view for the studio and the acoustic treatment to be carried out for the same. | CO3 | 16 |
| b. | Explain: STC and IIC criterion used in Acoustics. | CO1 | 4 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Layout a plan view of a small recording studio with minimum 2 control rooms and 2 studios. Discuss the acoustic treatment that need to be done for the studio complex isolate the studio from any airborne and structure borne noise intrusion. | CO3 | 20 |