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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17MT2003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AUDIO ENGINEERING** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | A person is seated at the last seat in the Elohim Auditorium. The guitarist 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.  (i) Calculate the distance travelled by the sound after reflecting  from the nearest sidewall.  (ii) Assuming that the auditorium is totally untreated, calculate the  dB SPL at the seat of the reflection.  (iii) Compared to direct sound, how much more time does the  reflection requires to reach the seat. | CO1 | 12 |
| b. | Discuss about the Spatial and loudness perception of human ear briefly. | CO2 | 8 |
| **(OR)** | | | | |
| 2. |  | A multipurpose closed auditorium is being constructed in the Karunya Campus. The seating capacity is estimated to be around 10,000. The auditorium is going to be used for common assembly session as well as Sunday services and also very occasionally (max 2-3 times a year) for big concerts. Suggest all the microphones that would be required to be purchased for the auditorium along with their required specification. Suggest also the microphone accessories that need to be purchased along with. Jutify your solution. | CO3 | 20 |
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| 3. | a. | A stereo track of digital audio is being recorded at 48kHz sampling rate and 16 bit resolution. Calculate the amount of space required to store the audio in the workstation if its being recorded in LPCM technique for period of 2 minutes. | CO3 | 10 |
| b. | Mention the application of the below mentioned microphone types:  i) Parabolic microphones  ii) Hydrophones  iii) Large Diaphragm Microphones  iv) Lavallier microphones  v) Boom mic | CO4 | 10 |
| **(OR)** | | | | |
| 4. | a. | There are 4 speakers on each side of Emmanuel Auditorium. Apart from that there are two monitors kept on stage and two side fills speakers. How many amplifiers would you recommend to be used to power all this Loudpspeakers? | CO4 | 4 |
| b. | Explain Bridged operation of an Amplifier. What are the consequences on the power amplifier when the signal it receives is clipped? How do one represent the sensitivity rating of the power amplifier? | CO4 | 6 |
| c. | Differentiate between Active Low Level Crossover and Passive High level crossover. | CO1 | 10 |
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| 5. |  | Mention the required number of loudspeakers with their specifications for Elshaddai auditorium in your campus. Illustrate their position and also mention the Power amplifier with required specifications to be used for the same. | CO4 | 20 |
| **(OR)** | | | | |
| 6. | a. | Differentiate between vented enclosure and closed enclosure. | CO4 | 10 |
| b. | List down and explain the specifications in Loudspeaker and amplifier critical for matching the amplifier with the loudspeaker in any LSR. | CO5 | 10 |
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| 7. | a. | Mention any 5 advantages of a Digital Audio mixer over Analog Audio mixer. | CO3 | 10 |
| b. | Assume you are an Audio Consultant approached by the management of a University to buy an Audio mixer for their Auditorium, then answer the below given questions and justify your answer briefly:  i) Will you suggest Analog or Digital Mixer?  ii) How many channel mixer would you suggest?  iii) Suggest one Brand with Model Name and Number.  iv) Where will you place the mixer in the auditorium? | CO5 | 10 |
| **(OR)** | | | | |
| 8. | a. | Suggest all signal processors that can be used to make the sound perfect for Emmanuel auditorium in our campus. Justify your answer. | CO5 | 10 |
| b. | Explain MIDI Protocol. List down and briefly explain different types of MIDI messages. | CO1 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. |  | Imagine you are called as one of the consultant to suggest a Live Sound solution for the DGS Dhinakaran Auditorium. With a neat sketch, mention the placement of the loudspeaker, microphones, mixer etc. Also mention the exhaustive list of equipments and their numbers that you would suggest to be purchased. Finally give a rough estimate of the cost that would be involved. | CO6 | 20 |