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



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

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|  |  |  |  |
| **Code :** | **17MT2038** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AUDIO SIGNAL PROCESSING** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **CO** | **Marks** |
| 1. | a. | Write short note on Audacity. | 1 | **10** |
|  | b. | Recall on Oscillators and its usage in Signal Processing. | 1 | **10** |
| **(OR)** | | | | |
| 2. |  | List down at least 5 applications of Audio Signal processing for Music Application. Explain each one of them in detail. | 1 | **20** |
|  |  |  |  |  |
| 3. |  | If the total number of samples (N) is given to be 4, find the DFT of the complex exponentials and the scalar product if x(n) = [1,-1,1,-1]. | 2 | **20** |
| **(OR)** | | | | |
| 4. |  | Discuss in detail the 4 properties of DFT: Energy Conservation and decibels, Phase unwrapping, Zero Padding, FFT and Zero Phase Windowing. | 2,3 | **20** |
|  |  |  |  |  |
| 5. |  | Write short note on all the windowing techniques used in audio signal processing. Discuss which one is most preferred according to their main lobe width and side lobe level. | 2 | **20** |
| **(OR)** | | | | |
| 6. |  | Draw the block diagram of an STFT system and explain the process in detail. | 2 | **20** |
|  |  |  |  |  |
| 7. |  | Explain in detail with suitable diagram the process of peak identification, fundamental frequency detection and error correction. | 2,3 | **20** |
| **(OR)** | | | | |
| 8. |  | Illustrate theblock diagram of a Harmonic Model System and explain the entire process of harmonic peak detection, sine spectral synthesis and recreation of an audio signal from their pitch and harmonics. | 3 | **20** |
|  | | **Compulsory:** |  |  |
| 9. |  | Pictorially, explain in detail the Stochastic model system. | 3 | **20** |