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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April / May – 2017**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14MT2034** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AUDIO SIGNAL PROCESSING** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Write short note on Audacity. | CO1 | 5 |
|  | b. | Write short note on Sonic Visualizer. | CO1 | 5 |
|  | c. | Mention all the libraries in Python useful for Audio Signal Processing and explain their features in detail. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | List down atleast 5 applications of Audio Signal processing for Music Application. Explain each one of them in detail. | CO1 | 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]. | CO2 | 20 |
| (OR) | | | | |
| 4. |  | Discuss in detail the 4 properties of DFT: Energy Conservation and decibels, Phase unwrapping, Zero Padding, FFT and Zero Phase Windowing. | CO2,CO3 | 20 |
| 5. |  | Write short note on all the windowing techniques used in audio signal prcessing. Discuss which one is most preferred according to their main lobe width and side lobe level. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Draw the block diagram of an STFT system and explain the process in detail. | CO2 | 20 |
| 7. |  | Explain in detail with suitable diagram the process of peak identification, fundamental frequency detection and error correction. | CO2,CO3 | 20 |
| (OR) | | | | |
| 8. |  | Draw the neat block diagram of an Harmonic Model System. Explain the entire process of harmonic peak detection, sinespectral synthesis and recreation of an audio signal from their pitch and harmonics. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | With a neat block diagram explain in detail the Stochastic model system. | CO3 | 20 |