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

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

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| **Code** | **:14MT2033** | **Duration :** | **3hrs** |
| **Sub. Name** | **:DIGITAL AUDIO EFFECTS** | **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. | Design an additive synthesizer with at least eight harmonics in pure data and explain the parts. | CO2 | 12 |
| b. | Design a simple semi-parametric Equalizer in Pure data. | CO2 | 8 |
| (OR) | | | | |
| 2. | a. | Differentiate a cos wave from a sine wave of equal frequency and amplitude. | CO2 | 3 |
| b. | Describe a Line object in Pure data with its application. | CO2 | 3 |
| c. | Design a patch to generate random tones in Pure data. | CO2 | 6 |
| d. | List and Explain any four types of objects available in pure data for creating patches. | CO1 | 8 |
|  |  |  |  |  |
| 3. | a. | Give an example for periodic and aperiodic signal. | CO1 | 2 |
|  | b. | Identify the phenomenon that would occur if 2 synced oscillators producing signals at 330Hz and 330.2HZ respectively where combined? | CO1 | 4 |
|  | c. | Describe an array? Give its application in Audio processing. | CO1 | 4 |
|  | d. | Analyze the following python code and explain line by line what is happening in the code.  import numpy as n  import wave  import struct  f=440  sampling\_rate=48000  n\_samples=48000  sine=[n.sin(2\*n.pi\*f\*x/sampling\_rate) for x in range(n\_samples)]  amplitude=16000  nframes=n\_samples  comptype="NONE"  compname="not compressed"  nchannels=1  sampwidth=2  wav\_file=wave.open("file.wav", 'w')  wav\_file.setparams((nchannels, sampwidth, int(sampling\_rate), nframes, comptype, compname))  for s in sine:  wav\_file.writeframes(struct.pack('h', int(s\*amplitude))) | CO2 | 10 |
| (OR) | | | | |  | With an example explain ADSR. |
| 4. | a. | With diagrams explain ADSR with real world implementations . | CO2 | 10 |
|  | b. | Design a simple reverb patch in pure data and explain the parts. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | When and Where does Dry and wet Mix happens in Audio Processing? | CO2 | 4 |
|  | b. | Define DC offset in Digital signal processing terminology. | CO2 | 3 |
|  | c. | Outline any two applications of an LFO. | CO1 | 4 |
|  | d. | Name any four types of waveform an oscillator produces that is musically useful. | CO1 | 4 |
|  | e. | With diagrams, Explain the working of the Flanger effect. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Recall the usage of this Pure data Object. | CO2 | 2 |
|  | b. | If a Carrier waveform at 400Hz is Ring modulated by a 600Hz waveform. Estimate the waveform components in the output. | CO2 | 2 |
|  | c. | Differentiate Unipolar from Bi-Polar signals. | CO1 | 2 |
|  | d. | Compare and Contrast Ring Modulation from Amplitude Modulation. | CO1 | 4 |
|  | e. | List and explain the working of compressors and limiters with their tweakable parameters. | CO1 | 10 |
|  |  |  |  |  |
| 7. | a. | Recall the application of the “Voice of God” channel in Surround System. | CO2 | 2 |
|  | b. | What do Ls and Rs stand for in surround sound terminology? | CO2 | 3 |
|  | c. | Explain the various types of automixers with their working. | CO2 | 15 |
| (OR) | | | | |  | What was the initial application of the vocoder? |
| 8. | a. | List out some of the problems in the old surround sound systems that ATMOS tries to sort. | CO1 | 5 |
|  | b. | List and explain the working of various types of Vocoders with their applications. | CO3 | 15 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the working of Fourier and How it is used in Audio effects industry. | CO3 | 8 |
|  | b. | Explain the working and application of Expanders and Enhancers | CO3 | 12 |