

Department of Electrical and Electronics Engineering

TY B. Tech (ECE/AIML) (2024-25)

Digital Signal Processing (ECE3005B)

Pen and Paper Assignment

Semester: 5 Date: 1/08/2024

Last Date of Submission: 12/08/2024 Max Marks: 30

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| Q.No.1 | An Analog signal is given by  𝑥 (t) = 6sin (**Last 4 digits of PRN no**.) πt+ 4cos (**Last 2 digits of PRN no** +250)πt .  If sampling frequency is 80 Hz. Obtain  1. Individual analog frequency components and their respective Nyquist rate.  2. Nyquist rate for composite signal.  3. Discrete time signal x (n) with all discrete frequencies in the fundamental range between 0 and ±0.5. | 10 Marks |
| Q.No.2 | Given X (K) = {**Last 2 digits of PRN no**, 4-2j, 20, 4+2j}.  Find x(n) using 4 point IDFT following sequence | 5 Marks |
| Q.No.3 | Calculate the circular convolution of the following sequences.  𝑥1(n)={ **Last 2 digits of PRN no**, 2, -1, -2 }  𝑥2(n)={ **First two digits of PRN** **no**, -2, 1, 3 } | 5 Marks |
| Q.No.4 | If x(n) be a finite duration sequence of length 8 such that  x[n]=[-1, 0, 2, 0, -4, 0, 2, Last Digit of PRN No.]. Find X(K) using DITFFT flow graph. | 10 Marks |