Vidyavardhini's College of Engineering & Technology, Vasai
Academic Year 2021-22
Department of Computer Science Engineering (Data Science)
Department of Information Technology
Department of Artificial Intelligence
Tutorial – III

Sub: Engineering Mathematics-IV **Year/Sem: SE/IV**
Date of assignment **Date of Submission:**
Module 3: *Z*-transform
CO3: **Apply the concept of Z- transformation and inverse in engineering problems.**

Q. No.	Questions	BL
1	Find the *Z*- transform of i) $\frac{1}{n+1}$ ii) $\cosh n\theta$	**3**
2	Find the *Z*- transform of i) $a^n \sinh n\theta$ ii) $a^{\lvert n\rvert}$	3
3	Find the *Z*- transform of $2n + \sin\frac{n\pi}{4} - 3a^4$. And region of convergence of $\frac{1}{n!}$.	3
4	Find the *Z*- transform of i) $u_k = {}^{k+n}C_n a^k$ *ii)* $u_n = \frac{1}{(n-r)!}$	3
5	Find inverse *Z*- transform of $\frac{4z^2 - 2z}{z^3 - 5z^2 + 8z - 4}$	3
6	Use convolution theorem to find inverse *Z*-transform of $\frac{z^2}{(z-a)(z-b)}$	3
7	Find inverse *Z*- transform of $\frac{z^3}{(z-1)^3}$ with appropriate ROC .	3
8	Find inverse *Z*- transform of $2z^{-2} - \frac{z^{-3}}{z-1} + \frac{2z^{-5}}{z-1}$.	3
9	Use convolution theorem to Find inverse *Z*- transform of $\frac{z^2}{(z-1)(2z-1)}$	3
10	Find $Z^{-1}\left\{\frac{3z^2+4z}{z^2-z+1}\right\}, \lvert z\rvert > 1$.	3