IAT 2 QUESTIONS

***********10 questions - 2 mark

Z-Transform of k^{n+4} is

a) $k^4 \dfrac{1}{z-k}$ b) $k \dfrac{z}{z-k}$ c) $k^4 \dfrac{z}{z-k}$ d) None of the above.   **CO2-L 1**

Ans-c

Z-Transform of $e^{-2n}n$ is

a) $\dfrac{e^{-2}z}{\left(z-e^{-2}\right)^2}$ b) $\dfrac{e^2 z}{\left(z^2-1\right)^2}$ c) $\dfrac{e^2}{\left(z-1\right)^2}$ d) None of the above.   **CO2-L 1**

Ans- a

$Z_T^{-1}\left[\dfrac{z^2}{z^2+1}\right] = $?

a) $\sin\left(\dfrac{n\pi}{2}\right)$ b) $\cos\left(\dfrac{\pi}{2}\right)$ c) $\cos\left(\dfrac{n\pi}{2}\right)$ d) None of the above.   **CO2-L 3**

Ans-c

If $Z\left(\dfrac{1}{n!}\right) = e^{\frac{1}{z}}$ then $Z\left(\dfrac{1}{(n+1)!}\right)$ is

a) $Z[e-1]$ b) $Z[e^z-1]$ c) $Z\left[e^{\frac{1}{z}}-1\right]$ d) None of the above.   **CO2-L3**

Ans-c

What is the Z-Transform Of $[\cos\theta + i\sin\theta]^n$

a) $\dfrac{1}{z-e^{i\theta}}$ b) $\dfrac{z}{z-e^{-i\theta}}$ c) $\dfrac{z}{z-e^{\theta}}$ d) $\dfrac{z}{z-e^{i\theta}}$ **CO2-L 1**

Ans-d

Inverse Z-Transform of $\dfrac{z}{(z-2)(z-3)}$ is

a) $2^n + 3^n$ b) $-2^n + 3^n$ c) $-2^{-n} + 3^n$ d) $-2^{-n} + 3^{-n}$ CO2-L 3

Ans-b

If $xe^{\frac{-x^2}{2}}$ is self reciprocal to itself under Fourier sine transform then Fs (u) is

a) $cu\,e^{-u^2/2}$ b) $cu\,e^{u^2/2}$ c) $u\,e^{-1/2}$ d) None of the above .   CO2-L2

Ans-a

The solution of the integral equation $\int_{0}^{\infty} f(x)\cos(\alpha x)dx = e^{-a\alpha}$ is

a) $\dfrac{2a}{\left(a^2 + x^2\right)}$ b) $\dfrac{2}{\pi\left(a^2 + x^2\right)}$ c) $\dfrac{2a}{\pi\left(a^2 + x\right)}$ d) $\dfrac{2a}{\pi\left(a^2 + x^2\right)}$ CO2-L 3

Ans-d

IF $f(x) = \begin{cases} 1 - x^2 & |x| < 1 \\ 0 & |x| \geq 1 \end{cases}$ then

a) $F(u) = \int_{-1}^{0} \left(1 - x^2\right)e^{iux}dx$ b) $F(u) = \int_{-1}^{1} \left(1 - x^2\right)e^{iux}dx$ CO2-L 1

c) $F(u) = \int_{0}^{1} \left(1 - x^2\right)e^{iux}dx$ d) $F(u) = \int_{0}^{1} \left(1 - x^2\right)e^{-iux}dx$

Ans-b

Inverse Fourier transform of F (u) is

a) $f(x) = \dfrac{1}{2\pi} \int_{-\infty}^{\infty} F(x)e^{-iux}dx$ b) $f(x) = \dfrac{1}{2\pi} \int_{-\infty}^{\infty} F(u)e^{iux}du$

c) $f(x) = \dfrac{1}{2\pi} \int_{-\infty}^{\infty} F(u)e^{-iux}du$ d) $f(x) = \dfrac{1}{2\pi} \int_{-\infty}^{\infty} F(x)e^{-iux}dx$ CO2-L 1

Ans-c

The Fourier transform of $e^{-a^2 x^2}, a > 0$ *is*

CO2-L 2

a) $\sqrt{\dfrac{\pi}{a}} e^{-\frac{u^2}{4a^2}}$ 　　　 b) $\sqrt{\pi} e^{-\frac{u^2}{4a^2}}$ 　　　 c) $\dfrac{\sqrt{\pi}}{a} e^{-\frac{u^2}{4a^2}}$ 　　　 d) $e^{-\frac{u^2}{4a^2}}$

Ans c

Solving the equation $\displaystyle\int_0^\infty f(x)\sin(\alpha x)\,dx = \begin{cases} 10, & 0 \le \alpha < 1 \\ 20, & 1 \le \alpha < 2 \\ 0, & \alpha > 2 \end{cases}$ *we get*

a) $\dfrac{20}{\pi x}(1 + \cos x - 2\cos 2x)$ 　　　 b) $\dfrac{20}{\pi x}(1 + \cos\alpha - 2\cos 2\alpha)$ 　　　 c) $\dfrac{20}{\pi x}(1 + \cos\alpha x - 2\cos 2\alpha x)$ 　　　 d) *None of the above*

CO2-L 3

Ans a

The Z *– transform of* $\cos\left(\dfrac{n\pi}{2} + \dfrac{\pi}{4}\right)$

CO2-L 3

a) $\dfrac{z^2 + z}{z^2 + 1}$ 　　　 b) $\dfrac{z^2 - z}{(z^2 + 1)\sqrt{2}}$ 　　　 c) $\dfrac{z^2}{(z^2 + 1)2}$ 　　　 d) $\dfrac{z}{z^2 + 1}$

Ans b

The Z *– transform of* $(n + 2)^2$ *is*

CO2-L 3

a) $\dfrac{z^2 + z}{(z - 1)^3}$ 　　　 b) $\dfrac{4z}{(z - 1)^2}$ 　　　 c) $\dfrac{4z}{(z - 1)}$ 　　　 d) *sum of all the options*

Ans d

If $\bar{U}(z) = \dfrac{2z^2 + 5z + 14}{(z-1)^4}$ then the value of u_3 is

$a)\,0 \qquad b)\,5 \qquad c)\,25 \qquad d)\,13$

CO2-L 3

Ans d

******* 2 questions 5 marks

If $f(x) = \begin{cases} 1\,for & |x| \le a \\ 0\,for & |x| > 1 \end{cases}$ Then the value of $\displaystyle\int_0^\infty \dfrac{\sin x}{x}\,dx$

$a)\ \pi \qquad b)\ \dfrac{\pi}{2} \qquad c)\ can\ not\ be\ obtained \qquad d)\ 1$

CO2-L 3

Ans b

Solving the difference equation $y_{n+2} - 4y_n = 0$ given $y_0 = 0,\ y_1 = 2$ we get

$a)\ y_n = (-2)^{n-1} + 2^{n-1} \qquad b)\,2^{n-1} + 2 \qquad c)\,(-2)^{n-1} \qquad d)\,(-2)^{n-1} - 2^{n-1}$

CO2-L 3

Ans a