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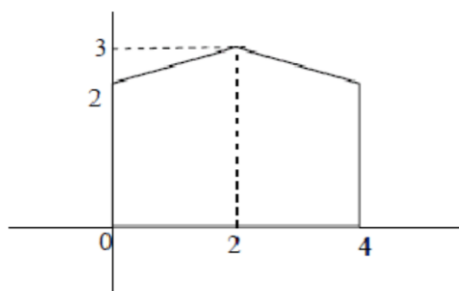**GATE ECE&EE Coaching By IITians GATE CLASSES**

Assignment 1

1. The transfer function of the system is given by $H(S) = \frac{1}{s^2(s-2)}$. The inpulse response of the system is
   A. $(t^2 * e^{-2t})U(t)$
   B. $(t * e^{-2t})U(t)$
   C. $(t^2 e^{-2t})U(t)$
   D. $(t\ e^{-2t})U(t)$

2. The transfer function of the system is given by $H(S) = \frac{1}{s(s-2)}$. The inpulse response of the system is
   A. $(t^2 * e^{-2t})U(t)$
   B. $(t * e^{-2t})U(t)$
   C. $(e^{-2t})U(t)$
   D. $(t\ e^{-2t})U(t)$

3. Let X(t) be the input to the LTI system. The required output is 4x(t-2).The transfer function of the system should be
   A. $4e^{j4\pi f}$
   B. $2e^{-j8\pi f}$
   C. $4e^{-j4\pi f}$
   D. $2e^{j8\pi f}$

4. No. of step functions and ramp functions involve in the following signal respectively is_____

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A. 2,2
B. 3,2
C. 2,3
D. 3,3

5. $\int_{-\infty}^{\infty}(t^2 + 2)\delta'(3t + 4) =$ _____
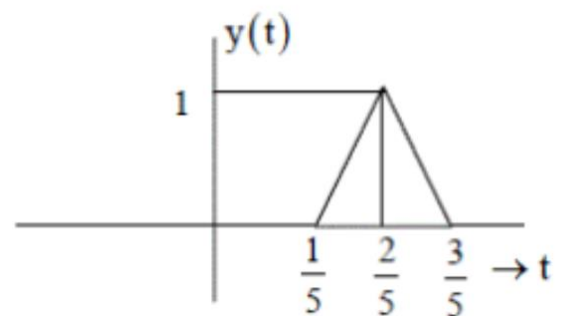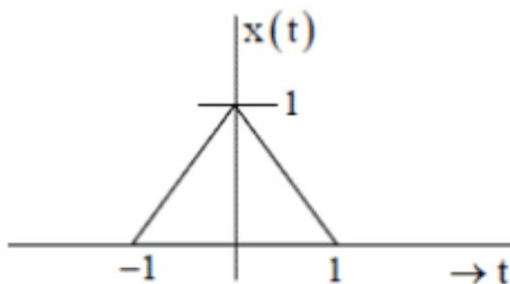
6. The period of a signal $\delta(\sin t) + \delta(\cos t)$ is _____

    A. π
    B. $\pi/2$
    C. $3\pi/2$
    D. 2π

7. Energy of a signal $e^{-4|t|}$ is _____

8. Real Part of conjugte symmetric portion of a signal $x(t) = e^{(3+5i)t}$ is
    A. $\sin 3t \sinh 5t$
    B. $\cos 3t \cosh 5t$
    C. $\cos 5t \cosh 3t$
    D. $\sin 5t \sinh 5t$

9. The given two signals x(t) and y(t) are related as, $y(t) = x(at - b)$. The value of a is_____

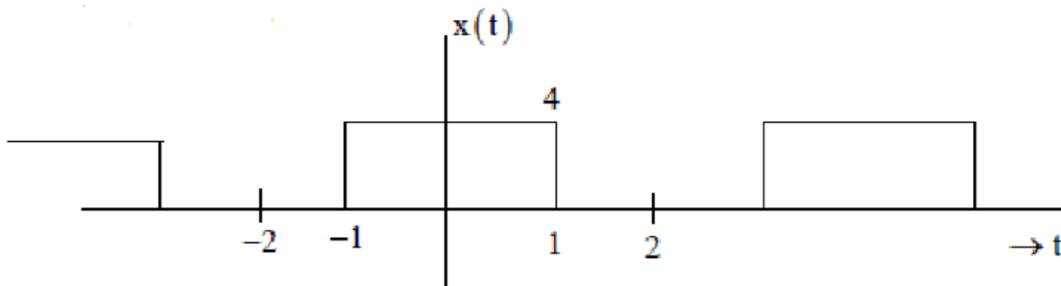10. Two signals x(t) and y(t) are defined as, $x(t) = 2[u(t) - u(t-2)]$ and $y(t) = 3[u(t-3) - u(t-5)]$. If $z(t) = x(t) * y(t)$ then the area of z(t)=_____

11. A Signal X(t) is given as follow,

The power of the signal $Y(t) = X(2t + 5)$ is _____W

12. A system with input – output relationship
$$y(t) = x(t) - x(t-3) \qquad\qquad x(t) \geq 0$$
$$= 0 \qquad\qquad x(t) < 0$$

   A. Linear & time variant
   B. Non-linear & time variant
   C. Linear & time invariant
   D. Non-linear & time invariant

13. The step response of a system is given as,
$$s(t) = \frac{2}{3}u(t) - \frac{1}{3}e^{-3|t|}$$
The impulse response of the system at t=-1 is _____

14. To an LTI system of impulse response $h[n] = \delta[n+2] - \delta[n-2]$ an input $x[n] = \delta[n-1] + \delta[n+1]$ is applied. The frequency response of the system is in the following form: $Y(e^{jw}) = k[\sin A\Omega + \sin B\Omega]$ then A and B is_____