520.214 Signals and Systems Self Test

1. What is the polar form of the complex number $1 + j$?

   (a) 1
   (b) $\sqrt{2} \cdot e^{j\pi}$
   (c) $\sqrt{2} \cdot e^{j\pi/4}$
   (d) $2 \cdot e^{j\pi/2}$
   (e) None of the above.

2. What is the polar form of the complex number $-1 - j$?

   (a) $-\sqrt{2} \cdot e^{j\pi/4}$
   (b) $\sqrt{2} \cdot e^{-j\pi/4}$
   (c) -1
   (d) $2 \cdot e^{-j\pi/2}$
   (e) None of the above

3. What is the polar form of the complex number $-e^{j\pi}$?

   (a) $1 \cdot e^{j0}$
   (b) $e^{-j\pi}$
   (c) $-\pi$
   (d) $e^{j\pi}$
   (e) None of the above

4. What is the polar form of the complex number $e^{j\pi/2}/(1 + j)$?

   (a) $e^{j\pi/2}$
   (b) $1/\sqrt{2}$
   (c) $\sqrt{2} \cdot e^{j3\pi/4}$
   (d) $(1/\sqrt{2}) \cdot e^{j\pi/4}$
   (e) None of the above

5. What is the rectangular form of the complex number $-e^{j\pi}$?

   (a) -1
   (b) $-1 + j\pi$
   (c) 1
   (d) $-1 - j\pi$
   (e) None of the above

6. Evaluate $(1+j)^4$

   (a) -4
   (b) $1+j$
   (c) $4+j4$
   (d) None of the above

7. Evaluate $\sqrt{j}$

   (a) $\pm j$
   (b) $e^{j\pi/4},\ e^{j5\pi/4}$
   (c) -1
   (d) None of the above

8. Evaluate $\left|e^{j10}/(3+j4)\right|$

   (a) 2
   (b) $1/7$
   (c) $1/5$
   (d) None of the above

9. What is the angle of the complex number $(1+j)\cdot e^{-j\pi/4}$?

   (a) $-\pi/4$
   (b) 0
   (c) $\pi/2$
   (d) None of the above

10. Simplify $\int_{-\infty}^{\infty} x(-3t+5)dt$

    (a) $5/3$
    (b) $\int_{-\infty}^{\infty} x(t)dt$
    (c) $(1/3)\cdot\int_{-\infty}^{\infty} x(t)dt$
    (d) None of the above

11. Evaluate $(d/dt)\int_0^2 x(\tau)d\tau$

    (a) $\dot{x}(t)$
    (b) $x(t)$
    (c) 0
    (d) None of the above

12. Evaluate $(d/dt)\int_t^0 x(\tau)d\tau$

    (a) $\dot{x}(t)$
    (b) $-x(t)$
    (c) 0
    (d) None of the above

13. Evaluate $(d/d\tau)\int_0^t x(\tau)d\tau$

    (a) $\dot{x}(t)$
    (b) $-x(t)$
    (c) 0
    (d) None of the above

14. Evaluate $\int_0^t (d/d\tau)x(\tau)d\tau$

    (a) $x(t)$
    (b) $\dot{x}(t)$
    (c) $x(t) - x(0)$
    (d) None of the above.

15. Evaluate $\int_{-\infty}^{\infty} e^{|t|}dt$

    (a) 2
    (b) 1
    (c) 0
    (d) None of the above.

Answers:

{ɔ, ə, ɐ, d, ɔ, ɐ, b, ɔ, q, ɔ, ɔ, b, ɔ, ɐ}