

ES.3

I) B

II) C

III) A

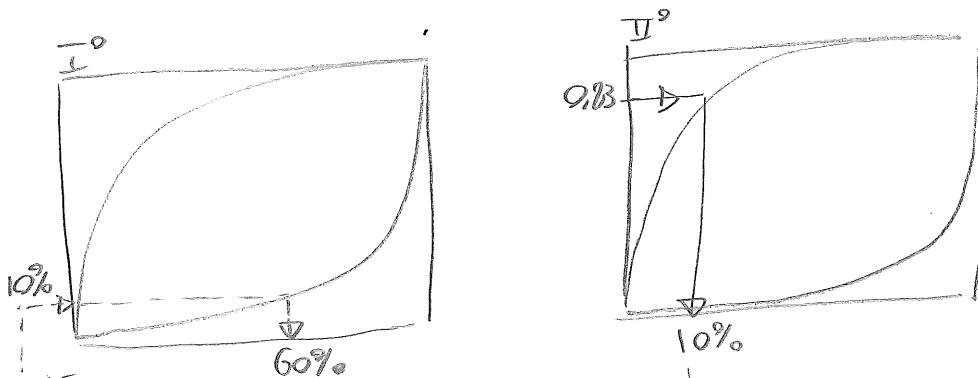
IV) $P\{succ < 2\} = P_7(0) + P_7(1) = \frac{7!}{7!0!} p^0 q^7 + \frac{7!}{6!1!} p^1 q^6 = 0.5767$

ES.4

I) C $\frac{VP}{VP+FM}$

II) $P_{TP} = P_{TP|M} P_M + P_{TP|S} \cdot P_S = 0.85 * prev + (1 - spec) * (1 - prev) = 6.85\%$

III)



I^0 test negativo
 II^0 test positivo

prevalenza pari a 60%

$$s(t) = \sum_{n=-\infty}^{\infty} S_n e^{j2\pi n t / T_0}$$

$$T_0 = 2s$$

$$s(t) = 1.5 e^{-j\pi/3} e^{-j6\pi t / T_0} + 3 e^{-j\pi/2} e^{-j2\pi t / T_0} + 5 e^{j\pi} + 3 e^{j\pi/2} e^{j2\pi t / T_0} + 1.5 e^{j6\pi t / T_0}$$

$$= -5 + 6 \cos\left(2\pi \frac{t}{T_0} + \frac{\pi}{2}\right) + 3 \cos\left(6\pi \frac{t}{T_0} + \frac{\pi}{3}\right) =$$

$$= -5 - 6 \sin\left(2\pi \frac{t}{T_0}\right) + 3 \cos\left(6\pi \frac{t}{T_0} + \frac{\pi}{3}\right) =$$

$$= -5 - 6 \sin(\pi t) + 3 \cos\left(3\pi t + \frac{\pi}{3}\right)$$

ES.6

$$s(t) = \text{rect}\left(\frac{t}{T}\right)$$

$$s_1(t) = \frac{d s(t)}{dt}$$

$$S_1(j) = j2\pi f S(f) = j2\pi f T \text{sinc}(fT) =$$

$$= j2\pi f T \frac{\sin(\pi fT)}{\pi fT} = j2 \sin(\pi fT)$$

$$s(t) \otimes h(t) \quad \longleftrightarrow \quad j$$

$$S(j) H(j) = \text{sinc}(fT) \text{rect}\left(\frac{fT}{2}\right)$$

$$s_3(t) = B \text{rect}\left(\frac{t - T/4}{T/2}\right) + A \text{rect}\left(\frac{t - 3T/4}{T/2}\right)$$

$$S_3(j) = \frac{BT}{2} \text{sinc}\left(\frac{fT}{2}\right) e^{-j2\pi f \frac{T}{4}} + \frac{AT}{2} \text{sinc}\left(\frac{fT}{2}\right) e^{-j2\pi f \frac{3T}{4}}$$

ES.7

I) A II) C III) A

ES.8

I) A

II) A

III) 97.1