Assignment 12

The due date for submitting this assignment has passed. Due on 2019-10-23, 23:59 IST. As per our records you have not submitted this assignment.

1) A pulsed radar has the following specifications: time of false alarm, $T_{fa} = 10$ mins, probability of detection, $P_d = 0.95$ and operating bandwidth $B = 1$ MHz. Determine the probability of false alarm $P_{fa}$

a. $1.67 \times 10^{-7}$

b. $1.67 \times 10^{-8}$

c. $1.67 \times 10^{-9}$

d. $1.67 \times 10^{-10}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

2)
For the specifications given in Q1, determine the SNR required at the receiver for a single pulse.

a. 31.7 dB  
b. 15 dB  
c. 30 dB  
d. 15 dBm

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
b.

3) Determine the value of the noise threshold voltage for the radar of same specification as given in Q1. Assume that the noise power spectral density is $-174$ dBm/Hz.

a. 0.4 $\mu$V  
b. 4.0 $\mu$V  
c. 0.4 nV  
d. 4.0 nV

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
a.

4) 

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
a.

5) 

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
a.
6) Determine the threshold to noise power ratio for the specifications given in Q5.

a. 22.55 dB
b. 22.55 dBm
c. 13.53 dBm
d. 13.53 dB

No, the answer is incorrect.
Score: 0
Accepted Answers: 

7) Determine the amount of peak power that is required to be transmitted by the transmitter of a radar with following specifications: operating frequency $f_0 = 1.5$ GHz, receiver loss $L = 4$ dB, $T_{fa} = 12$ mins, range of the target, $R = 12$ km with $P_o = 0.9$, RCS, $\sigma$ of the target at the specified range is 1 square-metre, bandwidth of the receiver $B = 2$ MHz, ambient temperature $T_0 = 290$ K, gain of the antenna, $G = 5000$, noise figure $F = 8$ dB. Assume the target is non fluctuating, and the radar is using a single pulse to detect the target.

a. 156 W
b. 106 W
c. 218 W
d. 255 W

No, the answer is incorrect.
Score: 0
Accepted Answers: 

8) For the specifications given in Q7, determine the peak transmitted power if the radar inte-
9) Any anomalous point-like target in GPR leaves
   a. a hyperbolic signature in a B-scan
   b. a hyperbolic signature in an A-scan
   c. an elliptical signature in a B-scan
   d. an elliptical signature in an A-scan

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b.

10)  

    a. 
    b. 
    c. 
    d. 

    No, the answer is incorrect.
    Score: 0
    Accepted Answers:
    c.