

report

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Name:

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Question one:

a.

Frequency=475Hz

Period=?(m/s)

Period=1/frequency=T=1/F

1/475=**0.0021m/s(3 s.f)**

Reduction by a factor of 5

1/5*0.0021=0.000422m/s

Frequency =1/period

1/0.000422=2,369.67Hz

1 Hz = 0.001 kHz

(2,369.67 Hz * 0.001 KHz)/1Hz=**2.370(3 s.f)**

b.

125.163.30.89 IP address to binary

128 64 32 16 8 4 2 1

125 in binary = **01111101**

163 in binary = **10100011**

30 in binary = **00011110**

89 in binary = **01011001**

Solution

=01111101.10100011.00011110.01011001

c. Source power is 0.1 W

Attenuated power is $100\mu\text{W}$ or 0.0001W

Let N be 30 km

So

$$0.1 * 0.1^N = 0.0001$$

$$0.1^N = 0.0001 / 0.1 = 0.001$$

Now take logs

$$N \times \log(0.1) = \log(0.001)$$

$$N \times -1 = -3$$

Therefore $N = 3$

So the distance = $N \times 30 = 30 \times 3 = 90$ km.

d. **01001100 – 10011111 – 01111011 – 00110101 – 11101010 – 11010110**

Convert to Hexadecimal

Hexadecimal	Binary
0	0000
1	0001
2	0010
3	0011
4	0100

5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1100
D	1101
E	1110
F	1111

Step one:

Divide the binary mac address in 4-digit bits.

0100, 1100 – 1001, 1111 – 0111, 1011 – 0011, 0101 – 1110, 1010 – 1101, 0110

Step two:

Read the 4-digit from the hexadecimal-binary chart.

0100, 1100=4c

1001, 1111=9f

0111, 1011=7B

0011, 0101=35

1110, 1010=EA

1101, 0110=D6

Solution

4c-9f-35-7B-35-EA-D6

Question two:

a)

WIFI (IEEE 802.11)

-The Wi-Fi (IEEE 802.11) has been in constant improvement over the years, and the up to date standard offers lower power consumption and hence saves more on battery power usage.

-It also offers higher throughput and ⁷range Wi-Fi networks that go further than typical networks in the 2.4GHz also 5GHz space (keep in mind, the lower frequency means the more extended ¹⁵range), with data then speeds up to almost 347Mbps.

⁵Zigbee

Zigbee is also a wireless technology that was developed as very an open global typical to deal with the unique requirements of the low-cost, the low power wireless IoT networks. Then the

Zigbee ordinary operates on the IEEE 802.15.4 physical radio requirements as well as operates in unlicensed bands consisting of 2.4 GHz, 900 MHz also 868 MHz. Also, the specification is a packet-based radio protocol anticipated for the low cost, the battery-operated devices. Then the protocol devices to correspond in a diversity of the network topologies as well as can have battery life long-lasting numerous years. Therefore the low duty cycle provides extended battery life.

2 LPWAN

A low-power wide-area network (LPWAN) or low-power wide-area (LPWA) network or low-power network (LPN) (LPWAN) is the form of wireless connection over an extensive area system, which is important for IoT business applications. LPWAN range is remarkably further than short-range communication techniques because it carries small bursts of information and can get up to several kilometres in the reduced data rate and low-power demand. As a result, it is suitable for IoT and cloud technology based care applications, e.g., remote patient observation and restoration. Among these protocols of LPWAN, LoRaWAN and Sigfox represent these most well-known measures. Although these two measures are well-developed and generally applied in IoT and cloud technology-based care applications, they are faced by growing competition from emerging standards. Some studies have proven that this 6LoWPAN has the potential to improve the foundation of the IoT in care.

I would recommend the usage of an LPWAN network due to its Long-range. The function ranges of the LPWAN technology vary from the only some kilometres within urban areas into in excess of 10 km within rural settings. Therefore it can as well enable efficient data communication within beforehand infeasible indoor as well as underground locations. Secondly, the Low power Optimized for the power utilization, the LPWAN transceivers be capable of run

on very small, reasonably priced batteries for up to 20 years. Furthermore, the Low-cost LPWAN's simplified, the lightweight protocols reduce complication within hardware design along with lower device costs. Also, it is long-range shared through a star topology reduce luxurious communications necessities, as well as the use of license-free or else, licensed bands, reduces network costs.

b)

Intensity = $1/\text{distance}^2$ (Inverse 4th law)

$$35 * 10^{-6} = 0.00035 \text{ watts}$$

$$0.00035 \text{ w} = 180 \text{ m}$$

$$1 \text{ w} = ? \rightarrow 180 / 0.00035$$

$$5.14 * 10^5 \text{ m/w}$$

$$1/(5.14 * 10^5)^2 \text{ m/w} * 540 \text{ m} = 2.04 * 10^{-7} \text{ w}$$

c)

First, we state the **fundamental principle of sampling**: to represent a signal $x(t)$ ideally with a set of samples $x[n]$ taken uniformly at a sampling rate f_s samples per second, and there should be **no aliasing** (spectral overlap) in the sampled signal $x_s(t)$'s spectrum $X_s(\Omega)$.

Then we define the ideally sampled signal

as $x_s(t) = x(t) \sum_{k=-\infty}^{\infty} \delta(t - kT_s)$ and its associated CTFT spectrum as:

$$X_s(\Omega) = 2\pi T_s \sum_{k=-\infty}^{\infty} X(\Omega - k2\pi T_s) \quad X_s(\Omega) = 2\pi T_s \sum_{k=-\infty}^{\infty} X(\Omega - k2\pi T_s)$$

Finally, we ask, given the consequences of sampling on the spectrum $X_s(\Omega)$ of the sampled signal $x_s(t)$, which set of frequencies f_s can satisfy the fundamental principle of no-aliasing. Then we try to determine the **minimum** of this set of valid sampling frequencies.

Lets apply this to your problem: Given your real bandpass signal with a spectrum as in the figure-1.

First, assume that for some $k=m$ the spectrum is shifted to the right by $m f_s$ such that the shifted left-piece stands closest from left to the original right piece in its original place. Then consider the next shift at $k=m+1$ so that the shifted left piece jumps over the original right piece and stands closest (from right) to the original right piece. These two conditions are mathematically yielding the following constraints on the sampling frequency f_s :

For the case one with $k=m$ we have:

$$-f_L + m f_s \leq f_L - f_L + m f_s \leq f_L$$

For the case $k=m+1$ we have:

$$-f_H + (m+1)f_s \geq f_H - f_H + (m+1)f_s \geq f_H$$

Combining these two yields:

$$f_s \geq 2(f_H - f_L) \quad f_s \geq 2(f_H - f_L)$$

In your case $f_H - f_L$ is 1010 kHz, so we conclude that

$$F_{smin} = 20 \text{ kHz}$$

d)

the wrong row is (c) →

1 0 1 1 0 1 1 1

The correct format would be

1 1 0 0 1 0 1 1

This is because the odd number of the bits was transmitted incorrectly.

Question 3

a) no account details.

b) ⁶ Artificial intelligence

Artificial Intelligence is a very wide-ranging division of the computer science-related with constructing very smart machines and capable of performing all tasks that naturally need human intelligence (Frankenfield, 2020). A.I. is also an interdisciplinary science by means of multiple approaches. Advancements into machine learning along with profound ⁸ learning, are creating a paradigm shift within practically every subdivision of the machinery industry.

Artificial intelligence identifies the machine capabilities that we have could be human intelligence. Since the definition is personal, whether the specific machine capacity is thought, artificial intelligence may change as our expectations of computers evolve. Since machines have

been able to accomplish certain specific jobs better than humans for hundreds (for instance, adding or subtracting amounts), we do not take many jobs to require human intelligence.

2. The artificial intelligence tries to solve the problem of patients skipping the appointments-no show.

A university health college collected the data used in London ¹ from 22,000 MRI scans from patients' appointments which included the time of day, the number of previous scans and how far from the hospital the person lived. The data did not include gender, age or ethnicity, details which are kept in a patient's medical records but are not as easy to extract from the hospital's appointments database. These factors could help improve predictions, Nachev said, but they chose not to include them because they wanted to come up with a tool that could be readily ¹ rolled out under existing IT infrastructure. An imprecise indication of which patients will attend could save hospitals vast sums of money and help cut waiting times."On average, we estimate this could save £2-3 per appointment," said Parashkev Nachev, a consultant neurologist at UCLH, who helped develop the tool. In partnership with the Turing Institute, there is the future ¹ potentiality for using artificial intelligence to take over a range of tasks traditionally performed by doctors, nurses and administrative staff, including diagnosing cancer on CT scans and deciding which A&E patients are seen first.

3. False Negative – the A.I predicts that the patient will attend the appointment, but the patient misses the appointment.

False Positive - the A.I. predicts that the patient will not attend the appointment, but the patient attends the appointment.

4. Very ¹ few hospitals are developing the expertise and infrastructure to develop and apply AI-based technologies hence their involvement with private companies, and ¹ it's dangerous to be giving data or selling data to enterprise since we don't know what that data contains. The use of artificial intelligence for electronic triage has both prevalent benefits and risks. Its profound benefits include proper diagnosis and enhanced image scanning. The risks involved might be system errors and failures and unclear lines of accountability

Works Cited

Domina, Thurston, Andrew Penner, and Emily Penner. "Categorical inequality: Schools as sorting machines." *Annual Review of Sociology* 43 (2017): 311-330.

Pelletier, Elizabeth, and Paul Manna. "Learning in harm's way: Neighborhood violence, inequality, and American schools." *The ANNALS of the American Academy of Political and Social Science* 674.1 (2017): 217-239.

Semuels, Alana. "Good school, rich school; bad school, poor school. " *The Atlantic* (2016).

Frankenfield, J. (2020, January 29). How Artificial Intelligence Works. Retrieved from <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp>

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