Jules' Workshop

Standard

Unit 19 – Answers

Q1 What is the difference between an analogue and a digital signal?

Analogue signals are continuously changing in amplitude where digital signals usually have only two states.

Q2 Complete the following table.

	MSB							LSB
Values	128	64	32	16	8	4	2	1
Number	**P8**	**P7**	**P6**	**P5**	**P4**	**P3**	**P2**	**P1**
185	1	0	1	1	1	0	0	1
127	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
62	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**
232	1	1	1	0	1	0	0	0
131	1	0	0	0	0	1	0	0
99	0	1	1	0	0	0	1	1

Q3 What is the ASCII code for capital A? (Look it up)

65 decimal or binary 01000001

Q4 What is a D to A?

Digital signal to analogue signal convertor

Q5 What is an A to D?

Analogue signal to Digital signal convertor

Q6 How is the optimum sampling rate calculated?

The number of sampling points on an analogue signal is determined by the Nyquist theorem which states that an analogue signal can be digitised, without aliasing errors, when the sampling rate is greater than or equal to twice the highest frequency component in the signal being digitised.

Q7 What is the optimum sampling rate for a signal that has a maximum frequency of 100KHz?

Greater than 200KHz

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Q8 Explain quantisation.

The level of sampling is import for the signal reproduction. Quantisation is the restoring of the signal from the samples. The number of levels in measuring the amplitude are important for the accurate reproduction of the signal.

Q9 What is an anti-aliasing filter?

AAF is a device used before a signal is sampled to restrict the bandwidth of a signal.

Q10 What is direct digital synthesis?

DDS is a method used in frequency synthesizers for creating waveforms from a single, fixed-frequency reference clock. DDS is a common technique for generating signals as the desired waveform is stored digitally in memory as a series of amplitude points.

Q11 What do the terms NRZ and RZ mean?

Non return to zero voltage signal

Return to zero voltage signal.

Q12 If in a data stream running at 9600 bps and each bit represents four characters, what is the baud rate?

2400 baud

Q13 What is a communications protocol?

A communication protocol is a set of rules that enables two or more entities to exchange information. A protocol defines the rules, syntax, semantics, and synchronization of communication and possible error recovery methods.

Q14 What is 2 – PSK?

2 PSK, also called Binary Phase Shift Keying (BPSK) or Phase Reversal Keying (PRK), is the simplest form of PSK. PSK uses two phases such as 0° and 180°. PSK handles the highest noise level or distortion before the demodulator reaches an incorrect decision making PSK the most robust of all the PSKs. The downside is that PSK is unsuitable for high data-rate applications.

Q15 Why is PSK 31 popular on amateur bands?

PSK31 is distinguished from other digital modes in that it is specifically tuned to have a data rate close to typing speed, and has an extremely narrow bandwidth, allowing many conversations in the same bandwidth as a single voice channel.

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