Jules' Workshop

Standard

Unit 15 – ANSWERS

Q1 Describe how a dynamic speaker works.

The incoming audio signals energise the coil which is repelled or attracted to the permanent magnet. The coil is attached to a diaphragm. As the coil and diaphragm moil back and forward in accordance with the audio signal, the diaphragm produces sound waves which are heard by the listener.

Q2 What are ZS, ZO and ZL?

Z_S = *Impedance of the signal source, transmitter*

Z_O = *Impedance of the line*

Z_L = *Impedance of the load, antenna*

Q3 Name an unbalanced transmission line.

Coaxial cable

Q4 Name a balanced transmission line.

Ladder line.

Q5 What is a waveguide?

A waveguide is a special form of transmission line consisting of a hollow metal tube.

Q6 How do you test a transmission line to measure the impedance?

First measurement is between the centre conductor and shield with the other end of the line open. This results in a value Z_{OC}, the Open Circuit Impedance.
Second measurement is between the centre conductor and shield with the other end of the line shorted between the centre and shield. This results in a value Z_{SC}, the Short Circuit Impedance.

~~Q7 From the previous test, you got results of 500 Ω and 100 Ω. What is the impedance of the line?~~

~~**223.6 Ω**~~

Q8 What is the velocity factor of cables?

The velocity factor (VF) of a transmission line is the ratio of the signal in the line compared to the speed of light.

Q9 Explain what is the SWR?

SWR is the ratio of the maximum to minimum voltage on a transmission line. SWR is measured using a dedicated SWR meter.

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~~Q10 Measuring the signal on a transmission line, the maximum is 12 V and the minimum is 2 V. What is the SWR?~~

~~**6:1**~~

~~Q11 Measuring the power of the signal on a transmission line, the maximum is 12 W and the minimum is 2 W. What is the SWR?~~

~~**2.38 : 1** using~~

Q12 How are cable losses quantified?

Decibels per metre

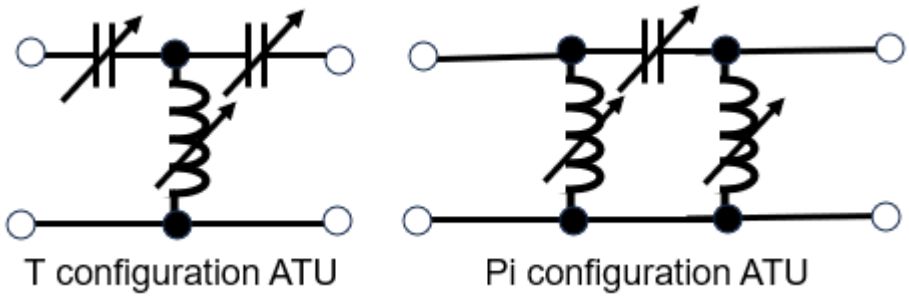
Q13 What is a balun?

A balun is a device that allows balanced and unbalanced lines to be connected without disturbing the impedance of either line.

~~Q14 Connecting a balanced line of 450 Ω to an unbalanced line of 50 Ω. What is the turns ratio for the balun?~~

~~**3:1**~~

Q15 Name and draw two common ATU configurations.



~~Q16 What is a piezo electric speaker?~~

~~**In a piezoelectric speaker, the coil and magnet are replaced with a crystal.**~~

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