

Instrumentation Engineering Job Interview Questions And Answers



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Instrumentation Engineering Interview Questions And Answers Guide.

Question - 1:

Why plc require in analog input 4-20amp & 0-10 volt?

Ans:

Because these are the signals which can change with respect to signal. 4-20 mA signal is used because if it can start from 0-20 then if there is an signal of instrument is not equal to or less than original signal and if there instrument is show 10% open valve at 4 mA then we can test it with giving it less than 4 mA.

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Question - 2:

Difference between mmwc and mmwg?

Ans:

I hope that your question is the difference between mmwc (millimeter of water column) and mmHg (millimeter of Mercury column)

The force exerted by a water column of say 100 mm (ie. the force exerted by a water column of height 100 mm at the bottom point of unit area) is 100 mmwc. The pressure is defined as Force per unit area and the unit of pressure is mmwc. When the liquid column is replaced by Mercury then the pressure is measured as mmHg. The density of Hg (Mercury) is approximately 13.6 times greater than water and hence the pressure exerted by Hg column is 13.6 times greater than water column of same height.

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Question - 3:

What happen if i install my pressure transmitter below the elevation of pipe in natural gas service?

Ans:

Pressure will be added up a bit more, see its detail:

1. Suppose, you want to install a pressure transmitter 10 meter below of pipe line.
2. Density of methane (Example) 0.656 kg/m³ at 25°C.
3. your pressure transmitter will show $(10 \times 1000 \times 0.656 = 6560 \text{ mm})$ 6569 mm of water pressure more.
4. Suppose gas pressure is 20 Kg/cm², then due to this elevation, transmitter will show 20.66 Kg/cm²

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Question - 4:

What is Cryogenic?

Ans:

Cryogenic means to work in lower temperature range (-50 and below than that).

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Question - 5:

What are the automatic controller MODES?

Ans:

Following are the mode of control. Ratio Control, PID Control, PI Control, ON/OFF Control, Cascade Control, Override Control, Feedback Control, Feed Forward Control. These control are can be set in to MAN and AUTO Mode, If this in MANUAL the mode of control is disable, If this is in AUTO the mode of control is enable.



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Question - 6:

What is coriolis principle for mass flowmeter?

Ans:

This meter uses the Coriolis effect to measure the amount of mass moving through the element. The substance to be measured runs through a U-shaped tube that is caused to vibrate in a perpendicular direction to the flow. Fluid forces running through the tube interact with the vibration, causing it to twist. The greater the angle of the twist, the greater the flow

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Question - 7:

How to use level transmitter in closed tank application?

Ans:

In closed systems, the transmitter location is restricted by the maximum allowable distance above the lower tap. In pressurized systems, this is the same as the 1 atmosphere equivalent seen previously. In sub-atmospheric systems (vacuum systems), the transmitter should be mounted at or below the lower tap. This ensures the transmitter always sees a positive pressure on both the measurement and the reference sides.

In two seal systems, the distance between the taps becomes the reference offset from zero. The calculations are the same regardless of where the transmitter is mounted.

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Question - 8:

if we have 450 mm height boiler drum level ,so what is span & zero value for a dpt transmitter?

Ans:

zero will be -400mm and span will be LRV will be -400mm and URV will be 0 mm.

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Question - 9:

What is Difference between PLC and CNC?

Ans:

CNC (Computer Numerical Control) is a particular application usually to control a multi axis machine tool such as a milling machine or a lathe but also could be a tube bending machine punch press or similar. The CNC controller is usually a purpose built controller using a micro computer but could be a general purpose computer or a PLC. The forerunner was NC (Numerical Control) before computers were readily available, it used solid state logic and relays, timers etc to provide the application.

A PLC (Programable Logic Controller) is a general purpose logic controller specifically designed to allow the user to create their own application. They select appropriate I/O (Inputs Outputs) and perhaps function modules for purposes such as communications and multi axis servo control and program the PLC to perform the required functions.

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Question - 10:

why use MMWC unit?

Ans:

milli meter water column used to measure pressure

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Question - 11:

Explain types of valves?

Ans:

various types of valves are used in industrial process controls. Various types of valves are ball valve, gate valve, globe valve, needle valve, mixing valve, diverting valve, butterfly valve etc. Actually this is just an overview of the types. To be elaborate we have several categories and



types.

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Question - 12:

How to trim the pressure transmitter?

Ans:

Ensure that you have the necessary document on your hand such as PTW.

Connect a HART Communicator, then close the Tx isolation valve and open the VENT isolation to atmosphere.

Apply LRV and check w/ HART Comm, if the LRV is out, perform TRIM function using HART 375/475

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Question - 13:

what is difference between differential pressure & delta pressure?

Ans:

Differential pressure means difference between high pressure & low pressure
delta pressure means it is the pressure drop..

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Question - 14:

Explain working principle of LVDT?

Ans:

When an AC excitation signal is applied to the Primary Coil (P), voltages are induced in the two Secondary Coils (S). The MAGNETIC CORE inside the COIL WINDING ASSEMBLY provides the magnetic flux path linking the Primary and secondary Coils. Since the two voltages are of opposite polarity, the Secondary Coils are connected series opposing in the center, or Null Position. The output voltages are equal and opposite in polarity and, therefore, the output voltage is zero. The Null Position of an LVDT is extremely stable and repeatable.

When the MAGNETIC CORE is displaced from the Null Position, an electromagnetic imbalance occurs. This imbalance generates a differential AC output voltage across the Secondary Coils which is linearly proportional to the direction and magnitude of the displacement. As shown in the figure, when the MAGNETIC CORE is moved from the Null

Position, the induced voltage in the Secondary Coil, toward which the Core is moved, increases while the induced voltage in the opposite Secondary Coil decreases.

LVDTs possess the inherent ruggedness and durability of a transformer and truly provide infinite resolution in all types of environments. As a result of the superior reliability and accuracy of LVDTs, they are the ideal choice for linear motion control.

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Question - 15:

What are the key components of control loop?

Ans:

A closed control loop in a very basic manner consists of sensor, transmitter, controller, signal converters and final control elements. Actually in a practical loop there will be many other instruments apart from this to support the working of above mentioned instruments.

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Question - 16:

What is the meaning of wet leg & where is it used?

Ans:

A process used to determine the differential pressure present within a liquid-filled space.

The formula for determining the differential pressure



within a wet leg design is: $d/p = h (SG)$

Where: d/p = differential pressure, h = height of liquid present, and SG = specific gravity

When the process vapors condense at normal ambient temperatures or are corrosive, this reference leg can be filled to form a wet leg. If the process condensate is corrosive, unstable, or undesirable to use to fill the wet leg, this reference leg can be filled with an inert liquid.

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Question - 17:

Square root calculation for dp flow transmitter?

Ans:

So, the way you would go about doing square root extraction is by using an analog multiplier. An analog multiplier has three inputs V_x , V_y & V_z . The output is given by $V_o = (V_x * V_y) / V_z$; If we set $V_y = 1V$ and $V_o = V_z$ through a feedback loop, we get $V_o.^2 = V_x \Rightarrow V_o = \sqrt{V_x}$.

If the interviewer further asks about an analog multiplier, you could mention that it can be designed by a combination of logarithmic/anti-logarithmic amplifier and an adder.

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