

Instrumentation Job Interview Questions And Answers



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Instrumentation Interview Questions And Answers Guide.

Question - 1:

Explain what is instrumentation?

Ans:

is a collective term for measuring instruments used for indicating, measuring and recording physical quantities

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Question - 2:

What is instrumentation?

Ans:

The technology which is used to measured and control the process system of plant is called instrumentation.

It is branch of engineering.

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Question - 3:

What is reynolds number?

Ans:

We know with help of reynolds number what type of flow in fluid.

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Question - 4:

Why do we use 4-20ma signal instead of 0-10 ma?

Ans:

To elevate zero so that we can come to know whether it is dead zero or from signal.

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Question - 5:

Instrument theory ques & answers.?

Ans:

ALL INSTRUMENTATION

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Question - 6:

What is the difference between dry leg and wet leg?

Ans:

Dry leg means in lab.. And wet leg means in feild

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Question - 7:

How can we clibrate a positioner?

Ans:

A positioner is a device put into a valve to ensure that it is at a correct position of opening as per the control signal. An I/P converter only sends the opening/closing request to valve but can not confirm its position.

Positioner senses the valve opening through a position feedback link connected to valve stem which is its input signal. I/P converter output is its setpoint input. The difference between these two is the error signal based on which the positioner positions the valve to correct position to reduce error to zero. Hence positioner is nothing but a pneumatic feedback controller. Controlled external supply air to positioner provides power to positioner to position a valve. Also positioner is used in a valve when valve operating signal range is different from I/P converter output range.



[View All Answers](#)

Question - 8:

Explain What is the working principle of the magnetic meter?

Ans:

An electric potential is developed when a conductor is moved across the magnetic field. In most electrical machinery the conductor is a wire. The principle is equally applicable to a moving, electrically conductive liquid. The primary device of commercial magnetic meters consist of straight cylindrical electrically insulated tube with a pair of electrodes nearly flush with the tube walls and located at opposite end of a tube diameter. This device is limited to electrically conducting liquids. The magnetic meter is particularly suited to measurement of slurries and dirty fluids.

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Question - 9:

Tell me the mechanism behind the turbine meter?

Ans:

Turbine meters consist of straight flow tube within which a turbine or fan is free to rotate about its axis which is fixed along the centre line of the tube. Mostly, a magnetic pick up system senses the rotation of the rotor through the tube walls. The turbine meter is a flow rate device, since the rotor speed is directly proportional to the flow rate. The output is usually in the form of electric pulses from the magnetic pick up with a frequency proportional to the flow rate.

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Question - 10:

How to choose differential range?

Ans:

The most common range for differential range for liquid measurement is 0-100. This range is high enough to minimize the errors caused by unequal heads in the seal chambers. It is also dependent on the differences in the temperature of the load lines. The 100 range permits an increased in capacity up to 400. While decrease down to 20 by merely changing the range tubes or range adjustments.

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Question - 11:

What is the working of Rota meter?

Ans:

Variable area meters are special form of head meters. Where in the area of flow restrictor is varied. So as to hold the differential pressure constant. The rota meter consists of a vertical tapered tube through which the metered fluid flows in upward direction. As the flow varies the 'float' rises or falls to vary the area of the passages that the differential across it balances the gravitational force on the 'float'. The differential pressure is maintained constant. The position of the 'float' is the measure of the rate of flow.

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Question - 12:

Explain What are de-saturators?

Ans:

When, in some processes, e.g. batch processes, long transient responses are expected during which a sustained deviation is present the controller integral action continuously drives the output to a minimum or maximum value. This phenomenon is called 'integral saturation of the control unit'. When this condition is met, then this unit is de-saturated.

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Question - 13:

Do you know How is automatic reference junction compensation carried out in temperature recorders?

Ans:

In automatic reference junction compensation, variable nickel resistor is used. As the temperature changes, so does its resistance. This reference junction compensator is located, so that it will be at the temperature of the reference junction. The reference junction is at the point where the dissimilar wire of the thermocouple is rejoined. This joint is invariably at the terminal strip of the instrument.

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Question - 14:

What is solenoid valve? Where it is used?

Ans:

A solenoid is electrically operated valve. It consists of solenoid coil in which magnetic plunger moves. This plunger is connected to the plug and tends to open or close the valve. There are two types of solenoid valves:

1. Normally Open
2. Normally closed

Use: It is used for safety purpose in different electric work

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Question - 15:

What is ratio control system?



Ans:

A ratio control system is characterized by the fact that variations in the secondary variable don't reflect back on the primary variable. A ratio control system is the system where secondary flow is held in some proportion to a primary uncontrollable flow.

If we assume that the output of a primary transmitter is A, and the output of the secondary transmitter is B, and that the multiplication factor of the ratio relay is K, then for equilibrium conditions which means set valve is equal to measured valve, we find the following relation:

$KA-B=0$ or $B/A = K$ where 'K' is the ratio setting off the relay.

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Question - 16:

How to test a transistor with a multimeter?

Ans:

1. Emitter +ve of meter and base -ve output =Low resistance
2. Emitter -ve of meter and base +ve output =High resistance
3. Collector +ve and base -ve output =Low
4. Collector -ve and base +ve output =Low

Emitter: Collector = High resistance

PNP: Opposite Results

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Question - 17:

What is motion balance principle?

Ans:

A controller which generates an output signal by motion of its parts. The increase in the baffle is to move towards the nozzle. The nozzle back pressure will increase. This increase in the back pressure acting on the balancing bellows, will expand the bellows. The nozzle is moved upward due to this. The nozzle will move until motion almost equals the input baffle motion.

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Question - 18:

What is force balance principle? State some of its' advantages?

Ans:

Force balance principle: A controller which generates an output signal by opposing torque. The input force is applied on the input bellows which moves the beam. This crackles nozzle back pressure. The nozzle back pressure is sensed by the balancing bellows which brings the beam to balance. The baffle movement is very less about 0.002 for full scale output.

Advantages:

- a. Moving parts are fewer.
- b. Baffle movement is negligible
- c. Frictional losses are less

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Question - 19:

What is zener diode? What is voltage regulator?

Ans:

The breakdown region of a p-n diode can be made very sharp and almost vertical diodes with almost vertical breakdown region are known as zener diodes. A zener diode operating in the breakdown region is equivalent to a battery. Because of this current through zener diode can change but the voltage remains constant. It is this constant voltage that has made the zener diode an important device in voltage regulation.

Voltage regulator: The output remains constant despite changes in the input voltage due to zener effect.

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Question - 20:

What is intrinsically safe system?

Ans:

Intrinsic safety is a technique for designing electrical equipment for safe use in locations made hazardous by the presence of flammable gas or vapours in the air. Intrinsically safe circuit is one in which any spark or thermal effect produce either normally or under specified fault conditions is incapable of causing ignition of a specified gas or vapour in air mixture at the most ignited concentration.

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Question - 21:

What is furnace draft control?

Ans:

Balanced draft boilers are generally used negative furnace pressure. When both forced draft and induced draft are used together, at some point in the system the pressure will be same as that of atmosphere. Therefore the furnace pressure must be negative to prevent hot gas leakage. Excessive vacuum in the furnace however produces heat losses through air infiltration. The most desirable condition is that the one have a very slight negative pressure of the top of furnace.

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Question - 22:

What are different types of control valves?

**Ans:**

The commonly used control valves can be defined as follows:

a. Depending on Action:

Depending on action there are two types of control valves 1. Air to close 2. Air to open

b. Depending on body:

Depending on body there are 4 types of control valves

1. Globe valves single or double seated

2. Angle valves

3. Butterfly valves

4. Three way valves

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Question - 23:

Name different types of bourdon tubes?

Ans:

Types of bourdon tubes:

1. C type

2. Spiral

3. Helix

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Question - 24:

What are primary elements of measuring pressure? Which type of pressure can be measured by these elements?

Ans:

Primary elements of measuring pressure are:

a. Bourdon Tube

b. Diaphragm

c. Capsule

d. Bellows

e. Pressure springs

These elements are known as elastic deformation pressure elements.

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Question - 25:

What is the use of valve positioner?

Ans:

Valve positioner can be used for following reasons:

a. Quick action

b. Valve hysteresis

c. Viscous liquids

d. Split range.

e. Line pressure changes on valve

f. Bench set not standard

g. Reverse valve operations

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Question - 26:

What is the use of double seated valve?

Ans:

In double seated valves the upward and downward forces on the plug due to reduction of fluid pressure are nearly equalized. It is generally used on bigger size valves and high pressure systems. Actuator forces required are less.

[View All Answers](#)

Question - 27:

What is the use of single seated valve?

Ans:

The single seated valve is used on smaller sizes where an absolute shut off is required. The use of single seated valve is limited by pressure drop across the valve in the closed or almost closed position.

[View All Answers](#)

Question - 28:

Name different parts of a pressure gauge? Explain the use of hair spring in the pressure gauge?

Ans:

Pressure gauge includes following components:

a. 'C' type bourdon tube.

b. Connecting link

c. Sector gear

d. Pinion Gear



- e. Hair spring
- f. Pointer
- g. Dial

Use of hair spring: Hair spring is responsible for controlling torque. It is also used to eliminate any play into linkages.

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Question - 29:

Tell me How is flow measured in square root?

Ans:

Flow varies directly as the square root of pressure. Thus, $F=K$ of square root of applied pressure. Since this flow varies as the square root of differential pressure. The pressure pen does not directly indicate flow. Thus flow can be determined by taking the square root of the pen. Assume the pen reads 50% of the chart. So, flow can be calculated using the pen measure in the chart.

[View All Answers](#)

Question - 30:

Explain How can a D.P. transmitter be calibrated?

Ans:

D.P. transmitter can be calibrated using following steps:

1. Adjust zero of Xmtrs.
2. Perform static pressure test: Give equal pressure on both sides of transmitter. Zero should not shift either side. If the zero shifts then carry out static alignment.
3. Perform vacuum test: Apply equal vacuum to both the sides. Zero should not shift.
4. Calibration procedure: Give 20 psi air supply to the transmitter and vent L.P. side to atmosphere. Connect output of the instrument to the standard test gauge. Adjust zero. Apply required pressure to the high pressure side and adjust the span. Adjust zero gain if necessary.

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Question - 31:

What is Bernoulli's theorem. State its application?

Ans:

Bernoulli's theorem states that the 'total energy of a liquid flowing from one point to another remains constant'. It is applicable for non-compressible liquids. For different types of liquid flow Bernoulli's equation changes. There is direct proportion between speed of fluid and its dynamic pressure and its kinetic energy. It can be used in various real life situations like measuring pressure on aircraft wing and calibrating the airspeed indicator. It can also be used to low pressure in the venturi tubes present in carburetor.

[View All Answers](#)

Question - 32:

Explain Why is the orifice tab provided?

Ans:

Following reasons justify for providing orifice tab:

1. Indication of orifice plate in a line
2. The orifice diameter is marked on it.
3. The material of the orifice plate.
4. The tag number of the orifice plate.
5. To mark the inlet of an orifice.

[View All Answers](#)

Question - 33:

Do you know How do you identify an orifice in the pipeline?

Ans:

An orifice tab is welded on the orifice plate which extends out of the line giving an indication of the orifice plate.

[View All Answers](#)

Question - 34:

Explain What are different types of orifice plates? State their uses?

Ans:

Different orifice plates are:

1. Concentric
 2. Segmental
 3. Eccentric
- Concentric: These plates are used for ideal liquid as well as gases and steam service. Concentric holes are present in these plates, that's why it is known as concentric orifice.
 - Segmental: This plate has hole in the form of segment of the circle. This plate is used for colloidal and sherry flow measurement.
 - Eccentric: This plate has the eccentric holes. This plate is used in viscous and sherry flow measurement.

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Question - 35:

List of Instrumentation Engineering Job Interview Questions!

Ans:



1. How can leveltrol be installed in steam drum for measuring the level of steam drum?
2. What is ultrasonic flowmeter?
3. Differentiate between ultrasonic flowmeter and radar type flow meter.
4. What is the use of temprature compensation?
5. What is modbus?
6. How signals can be taken through modbus?
7. How earthing can be checked?
8. How many ohms are required for proper earthing?
9. Explain signal isolator.
10. Which wiring connection is preferred in motor for industrial use?
11. What do you mean by trim?
12. How DP Transmitter can be calibrated for crude application in floating roof tank?
13. What is the principle of capacitance type level transmitter?
14. How process line mpm calculation is done?
15. Explain PLC Level and its type?
16. What is procedure on mmwc in to tph?
17. How an rtd work, and what volts/current goes to a RTD to measure the resistance?
18. What is consistency transmitter and describe its working?
19. How to calculate MMWC values into tonnes?
20. How can I make calculation to Install level transmitter (DP) for open tank and close tank?
21. What is difference between DO and DI?
22. What is loop1 and loop2 in MTS LT?
23. How to calibration a control valve?
24. What is dry leg calibration and where is it used?
25. How flow can be measured with dp?
26. Why MMWC unit is used?
27. How HART protocol can be connected with control valves?
28. What is the meaning of slope in PH transmeter?
29. What is Difference between PLC and CNC?
30. If we have 450 mm height boiler drum level, so what is span & zero value for a dpt transmitter?
31. How can level transmitter in closed tank application be used?
32. Why ac supply load cell is used? Can we use the dc supply load cell?
33. What are advantages and disadvantage of the ac supply load cell?
34. What is coriolis principle for mass flow meter?
35. What are the automatic controller MODES?
36. What is Cryogenic?
37. What happen if we install my pressure transmitter below the elevation of pipe in natural gas service?
38. What are the reliability data, like failure rate etc, for bently Nevada systems & vibration probes?
39. What is the meaning of wet leg & where is it used?
40. What are the key components of control loop?
41. Working principle of lvd?
42. What is difference between differential pressure & delta pressure?
43. How to trim the pressure transmitter?
44. What are different types of cable?
45. What is the use of control cable?
46. Which type of diaphragm use in costic line, DM water line, natural gas line, oil line?
47. What are different types of valves?
48. What is the hydra step level sensor output value (measuring level of steam drum)?
49. What is mean by live zero and dead zero?
50. When a magnet is heated?
51. Why the degree of valve plugs and valve seat is slightly different I control valve trim design?
52. What is modbus, profibus, fieldbus?
53. What is the use of gauge?
54. How to calibrate differential pressure switch?

[View All Answers](#)

Question - 36:

Why thermo wells are used? What materials are used in thermo wells?

Ans:

In numerous applications, it is neither desirable nor practical to expose a temperature sensor directly to a material. Wells are therefore used to protect against damage corrosion, arosion, aborsion and high pressure processes. A thermo well is also useful in protecting a sensor from physical damage during handling and normal operations.

Materials used in thermo wells: Stainless steel, Inconel, Monel, Alloy Steel, Hastelloy

[View All Answers](#)

Question - 37:

Can you explain the burnout feature?

Ans:

Burnout provides the warnsgug feature of driving indicator at the end of scale, if the input circuit is open. A burnout resistor is provided which develops a voltage drop between the measuring circuit and amplifier. The polarity of the signal determines the direction of the servo drive upon an open circuit in the input.

Upscale burnout: R value 10 M

Downscale burnout: R value 22 M

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Question - 38:

What is constant voltage unit?



Ans:

The constant voltage circuit consists of a rectifier, CR and a filter capacitor. It is followed by two stages of zener regulation. A bridge configuration is provided to lamp line voltage zener regulation. Regulation 1 and regulation 2 provides relatively provide constant current. Resistors form a bridge that may remoment line voltage effects.

[View All Answers](#)

Question - 39:

Tell me the working of an enraf level gauge?

Ans:

Enraf level gauge is based on the ser powered null balance technique. A displacer serves as continuous level sensing element. A two phase ser motor controlled by a capacitive balance system winds unwinds the the measuring wire until the tension in the weight springs is in balance with the weight of the displaced part immersed in the liquid. The sensing system in balance measures the two capacitance formed by the moving central sensing rod provided by the two capacitor plates and the si plates.

[View All Answers](#)

Question - 40:

Do you know the working of an electronic level troll?

Ans:

The variation in level of buoyancy resulting from a change in liquid level varies the net weight of the displacer increasing or decreasing the load on the torque arm. This change is directly proportional to change in level and specific gravity of the liquid. The resulting torque tube movement varies the angular motion of the rotor in RVDT providing a rotor change proportional to the rotor displacement, which is converted and amplified to a D.C. current.

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Question - 41:

Explain How D.P. transmitter can be applied to open tank?

Ans:

In open tank the lower pressure side is vented to the atmosphere. All pressure is applied to the high pressure side. This vessel pressure is measured through high pressure side.

[View All Answers](#)

Question - 42:

Do you know How D.P. transmitter can be applied to close tank?

Ans:

In closed tank, bottom of the tank is connected to the high pressure side of the transmitter. Top of tank is connected to the lower pressure side of the transmitter. In this way vessel pressure can be measured.

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Question - 43:

Why we are using resistance with limit switch?
why we are using line monitoring in limit switch?

Ans:

if some one knows answer please send me on this mail (mudi_inst [at] yahoo [dot] com)
thanks

[View All Answers](#)

Question - 44:

What is the function of 3-way manifold valve?

Ans:

excessive pressure to your differential pressure transmitter, you could damage your instrument. This is known as over-ranging the transmitter. A three-way manifold valve is a device that prevents the instrument from being over-ranged. It also allows the isolation of the transmitter from the process loop (an option which could be used generally for maintenance or re-calibration or fitting new equipment).

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Question - 45:

Why we giving input to electronic amplifier in inverting pin? what is the reason behind that?

Ans:

if we need a phase shift than we give input n inverting pin or when we need to boost signal at higher level, i.e; using cascade stages of amplification(even) than we also use inverting pin

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Question - 46:

How to use control and instrumentation terminology and its correct context on circuit breakers?

Ans:

No idea...



need answer of this question plz share if any one knows how to use control and instrumentation terminology
Thanks in advance....

[View All Answers](#)

Question - 47:

What is the output range of transmitter?

Ans:

4 -20 ma,0-10v

[View All Answers](#)

Question - 48:

Difference between DCS and PLC including data processing and architecture.

Ans:

If we have more I/o's in digital signals than analogue signals normally we choose DCS....and vice versa.

[View All Answers](#)

Question - 49:

What is Instrumentation technologists and mechanics?

Ans:

Instrumentation technologists, technicians and mechanics specialize in troubleshooting and repairing instruments and instrumentation systems. This trade is so intertwined with electricians, pipefitters, power engineers, and engineering companies, that one can find him/herself in extremely diverse working situations. An over-arching term, "Instrument Fitter" is often used to describe people in this field, regardless of any specialization. oo nga.

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Question - 50:

What is Instrumentation Instrumentation engineering?

Ans:

Instrumentation engineering is the engineering specialization focused on the principle and operation of measuring instruments which are used in design and configuration of automated systems in electrical, pneumatic domains etc. They typically work for industries with automated processes, such as chemical or manufacturing plants, with the goal of improving system productivity, reliability, safety, optimization and stability.

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Question - 51:

What is Instrumentation Control?

Ans:

In addition to measuring field parameters, instrumentation is also responsible for providing the ability to modify some field parameters.

Some examples include:

Device Field Parameter(s)
Valve Flow, Pressure
Relay Voltage, Current
Solenoid Physical Location, Level
Circuit breaker Voltage, Current

[View All Answers](#)

Question - 52:

What is Instrumentation Measurement?

Ans:

Instrumentation can be used to measure certain field parameters (physical values):

These measured values include:

- * pressure, either differential or static
- * flow
- * temperature - Temperature_measurement
- * level - Level Measurement
- * density
- * viscosity
- * radiation
- * current
- * voltage
- * inductance
- * capacitance
- * frequency
- * resistivity
- * conductivity
- * chemical composition
- * chemical properties
- * various physical properties

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**Question - 53:**

Can we use a control valve without positioner?

Ans:

Control valve can not be without positioner. The purpose of the positioner is to control the control valve stroke so as to keep the valve in desired position. The positioner receives signal from the controller, and send the boosted signal to the actuator to reach the desired position as and when the valve reaches the desired position the positioner cuts the boosted signal to the actuator and keeps the position.

[View All Answers](#)

Question - 54:

Why 4-20 mA signal is preferred over a 0-10V signal?

Ans:

Generally in a transistor some amount of voltage is required for turning it on. This voltage is the cut in voltage. Up to this voltage the exists a nonlinearity in its characteristics. Beyond this cut in voltage the char. of transistor is linear. This nonlinear region lays between 0-4ma, beyond 4ma it linear. This is why 4-20 ma range is used.

[View All Answers](#)

Question - 55:

What is remote mount with MTA option? (In case of Dual Sensor Vortex Flowmeter, rosemount has written in its Catalog drawings)?

Ans:

Remote mount with MTA means MTA connector for mounting remote connection. MTA is the Connector used for connection. Generally we called it MTA Connector. There are many types of MTA connector such as MTA 100connectors, Mta 156 connectors etc...

[View All Answers](#)

Question - 56:

How to write the program for single push button by using Ladder diagram?

Ans:

1. Create a Push button
2. Connect a Counter series to PB
3. Create a compare button
4. Initialize 1 at one end
5. Counter output in another
6. Connect the Coil which has to be energized
7. Initialize 2 at one end
8. Counter output in another
9. Connect the Coil which has to be reenergized.

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