Sample Paper of Industrial Automation and control with Answers for Electronics and communication and Electronics and Instrumentation

Industrial Automation and Control is one of the important subjects for ECE and EIE students. This subject plays very important role in the Industrial visit for your vocational training as well as for your On or Off campus Interview. Here is the important question with answers for your better academic preparation as well as for VT and Interview. Also you can download this paper in PDF format from the link given below. All the Best!!

BRANCH: ECE

TIME: 3 HRS

NOTE: All the questions from the section-A is compulsory and any 3 from Section B

SECTION-A

SHORT QUESTIONS: (EACH 2 MARKS)

1. What is industrial automation?

ans: Industrial automation is a set of technologies , that result in operation of industrial machine and system without significant human intervention and approach performance superior to manual operation.

2. What are the different costs included in Industry in designing the particular product?

ans: Material costs, man-power costs, energy costs, infrastructure cost.

3. What is production volume?

ans: It is divided into 4 types:- production time, material handling time, quality assurance time

4. List the categorization of production system.

ans: Continuous flow, batch manufacturing, mass manufacturing, job shop

5. What are the types of automation?

ans: Fixed automation, Programmable automation, Flexible automation, integral automation

6. What are the features of Flexible Automation?

ans: Electronic control and changeable operation sequence.

7. What is factory type of Integral automation?

ans: All kind of factory level but large one.

8. Define process.

ans: A sequence of interdependent and linked procedure which use resources every stage to convert certain input to a certain output to achieve a certain goal.

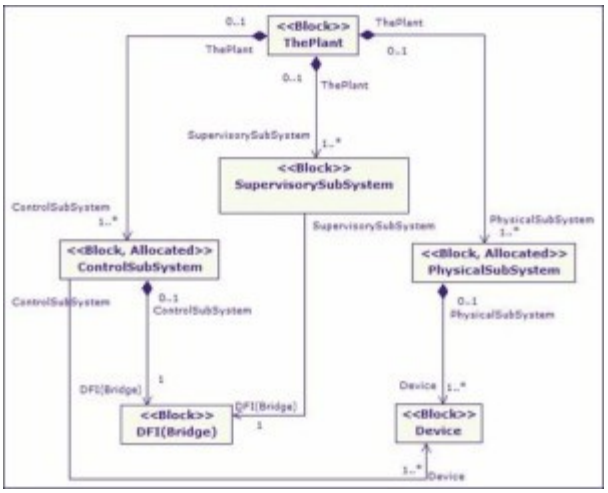
10. What are process variables?

ans: Control variable, controlled variable, load variable.

Section-B

LONG QUESTIONS: (EACH 10 MARKS)

1. What is the structure of Industrial Automation?



ans:

2. What is the element of Industrial control?

ans: the element used in industrial automation are

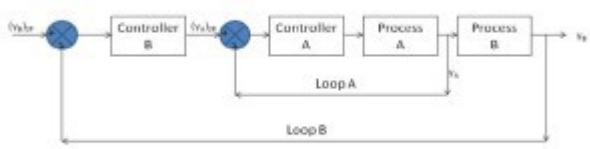
Controller

Actuator

Plant

Sensor

3. Draw the diagram of cascade control loop.



ans:

4. What is **programmable logic controller** design?

ans: A programmable controller can be studied by considering the basic elements like processor, the input modules, output modules and the software .

Processor: the processor is a computer that executes a program to perform the operation specified in a ladder diagram or a set of Boolean equations. The processor performs arithmetic and logic operations on input variables data and determines the proper state of the output variables.

The heart of a PLC is a microprocessor, much like the ones used in modern personal computers. Because much of the data in PLC operation is processed bit by bit special microprocessors optimized for such operation.

Input Modules: The input modules examine the state of physical switches and other input devices and put their state into a form suitable for the processor. The PLC is able to accommodate a number of inputs called channels.

Modern PLC and the input sensors to which they are connected are much more versatile. This is also has a great advantage with respect to electrical safety since the ac power is not connected to the switches. Many input modules also can be used in the networked environment wherein the input signal arrives as serial digital data encoded with the input device are connected to the input module, the result is that the state of each devices is presented to the PLC processor.

Output Modules: The objective of the output module is ultimately to supply power to an external device such as motor, light , solenoid and so on as required by the ladder diagram. Early relay logic sequences were able to provide 120 vac directly to device as long as the power requirement was not too great.

5. Describe about PLC operation.

ans: Operation of the programmable controller can be considered in two modes, the I/O scan mode and the execution mode.

I/O Scan Mode : During the I/O scan mode , the processor updates all outputs and inputs the state of all inputs one channel at a time. The time required for this depends on the speed of the processor.

Execution Mode : During this mode, the processor evaluates each rung of the ladder diagram program that is being executed sequentially , starting from the first rung and proceeding to the last rung. As a rung is evaluated, the last known state of each switches and relay contact in the rung is considered.

Scan time: An important characteristic of the programmable controller is how much time is required for one complete cycle of i/o scan and execution.
The scan time may have an impact on the ability of the PLC to detect events that occur on the inputs.