SET-12

3. With reference to Car Manufacturing Company, differentiate between roles of Quality Assurance (QA) and Quality Control (QC).

Solution:

Although Quality Assurance and Quality Control are similar to each other they are both different processes. Quality assurance is process oriented and focuses on defect prevention whereas quality control is product oriented and focuses on defect identification.

Their roles in a Car Manufacturing Company can be differentiated as follows:

**Roles of Quality Assurance (QA):**

Quality Assurance is done when the car is almost at the end of the production. After putting together all the parts of the vehicle, the complete car is put under various tests for the final time so that it is worthy of the warranty provided by the car company. It may include the following processes:

* Every parts of the interior of the cars are thoroughly checked. The bodywork and the exterior trims are properly inspected. This is done completely by the QA team members’ hands. They are specially trained to feel along the body panels and panel gaps to check for imperfections.
* After the completion of interior and exterior checks, the main mechanical components of the car linked with its engine is tested. This may include the engine itself by starting the engine, the underbody components like fit and finish of the exhaust and floor pan and the steering alignments.
* The ECU of the car must be tested to ensure proper functioning of the car. The electronics components like headlamps, tail lamps, fog lights and indicators are also inspected to ensure the measurements of their height, angle beam and brightness for the desired reach of light along with the proper functioning of their switches.

Other electronic components like electric windows, doors, boot lid, side mirrors, wipers, air conditioners and infotainment system are also examined.

The tests for the airbags and the electric steering are also performed if installed.

* The car must be able to function properly in wet conditions too, most probably for rain. For this, various water proofing tests are required on the exterior of the car by showering water under pressure similar to that of rain. The brakes and tire tests are also performed for safety when the road is damp.
* The electronic stability control (ESC) or traction control is also to be examined properly. This test is included for safety in almost every type of vehicles. But for high performance vehicles, this improves the overall performance of the vehicles also.
* Finally, the car is tested for dents and scratches in a light tunnel to ensure that the car looks the best and polished with its respective paintwork.

**Roles of Quality Control (QC):**

Quality control is a process that is used to insure that a product is free from bugs, operational issues and any number of other problems. The quality control process starts long before the first production models of a vehicle roll off the assembly line. Its processes can be mentioned as follows:

* The quality control team have designed several tests to determine how well a car will stand up to real-world and extreme use. They drive the prototype car over specially designed surfaces to test the smoothness of the ride and the durability of the suspension.
* They also expose the cars to extreme heat and cold weather to test how the various mechanical components will work in all types of weather. They even fill a car with smoke and then check all the window and door seals to insure if it is functioning properly.
* One of the most well-known quality-control tests is the crash test. While most people are familiar with government and insurance industry crash tests, car makers also run their own tests to make sure its products and safety systems will work as they were designed to and protect the vehicle's occupants.
* The quality control team can mimic and even exceed real-world conditions in their own testing centers. With the help of more precise sensors and computer programs, they can take more detailed measurements of a car's responses to the tests. They are also able to add automated quality control systems to assembly lines, so defects like a poorly fitted part or a bad weld can be automatically detected and dealt with.
* Despite the incredible advances in automotive quality control, the most important component in building a quality car is the human touch. If they see a problem with a product, the specially trained employees are encouraged to come forward and repair it manually so that the company can make it right. Even though this doesn't necessarily prevent all quality issues at the factory, a sharp set of human eyes and a commitment to manufacture the best vehicle possible helps keep the vehicles of the company safe and running properly.