1. What was the failure mechanism that caused the collapse of the 3-ton concrete ceiling panels within Boston's "Big Dig" tunnel system?

Impact

Corrosion

Thermal shock

Creep

1. Engineering design is usually performed in isolation.

True

False

1. Cognition refers to the way in which a user learns about a device and masters its \_\_\_\_\_\_\_\_\_\_\_\_.

Features

Quirks

Colors

Options

1. What was the design flaw of the Tacoma Narrows Bridge?

The bridge was tempered with.

The wrong materials were used.

Stiffening trusses were omitted.

It was a copy of other smaller bridges, and no calculations were done to prove the structural integrity of the longer bridge.

1. A project management tool that graphically depicts the amount of time allotted to each task, plotting the project tasks versus time, is the

PERT chart

Org chart

Decision matrix

Gantt chart

1. If you need to make just a few copies of your designed part, sand casting is a better option than die casting because the molds for sand casting are much less expensive.

True

False

1. On a stress-strain curve, Young's modulus appears as

The slope of the initial linear region

The point at which the specimen breaks

The region of plastic deformation

The highest peak on the curve

1. Many factors influence design choices. The Challenger disaster was a result of which influence(s)?

Money

Ethics

All of these answer choices

Political

1. The human brain functions better as an image processor than as a calculator.

True

False

1. The difference between engineering stress and true stress is that engineering stress is based on the original area, while true stress is based on instantaneous area.

True

False

1. Fatigue failure only occurs when a material is loaded beyond its ultimate tensile strength (UTS).

True

False

1. The stiffness of a material is given by its

Young’s modulus

Poisson’s ratio

Fracture strength

Hardness

1. Forging, rolling, and extrusion are often done in multiple incremental steps rather than as a single-step operation to achieve the final desired shape.

True

False

1. If undesired residual stresses are present in our manufactured part, there is unfortunately no way to remove them.

True

False

1. Which of the following are fabrication methods commonly used for plastics?

Extrusion

3d printing

Blasting

Injection molding

1. What was the cause of the walkway collapse at the Kansas City Hyatt Regency, which killed more than 100 people?

The original design using one threaded suspension rod was modified to use two threaded rods, without suitably accounting for the load.

The original design using two threaded suspension rods was modified to use one threaded rod, without suitably accounting for the load.

The construction team neglected to install washers, to save money.

The steel rods for suspending the walkways were not properly coated to prevent corrosion.

1. A project management tool that clearly illustrates task dependencies and is useful for identifying the critical path is the

Gantt chart

PERT chart

Org chart

Decision matrix

1. Anthropometry is important to the field of ergonomics.

True

False

1. FMECA is a \_\_\_\_\_\_\_\_\_\_ tool.

Failure analysis

Project management

Rapid prototyping

Product cost analysis

1. During a brainstorming session, part of the Design Generation phase of the design cycle, which ideas should be ignored or thrown out?

No ideas should be ignored or thrown out

Overly complicated ideas

Expensive ideas

Ridiculous ideas