1. A SWOT analysis is a structured way of identifying a potential design’s *Strength*, *Weakness*, \_\_\_\_\_\_\_\_, and *Threats*.

Opportunities

Options

Offenses

Objectives

1. In the four-step “simple representation” of the engineering design cycle that we are using in this class, what are the first two steps?

Problem Analysis and Design Generation

Design Generation and Design Realization

Problem Analysis and Prototyping

Design Generation and Design Evaluation

1. Which of the following shows the hierarchy and management structure of a group?

Organizational chart

PERT chart

Gantt chart

Venn diagram

1. Engineers typically work in inter-dependent and multi-disciplinary teams.

True

False

1. With advancements in technology in the last 100 years, infant mortality and life expectancy at birth have both declined considerably.

True

False

1. When considering a new design option, starting with rough estimations (a “Back of the Envelop” analysis) is a good way to test feasibility.

True

False

1. The physical appearance of a prototype should be identical to that intended for the finished product.

True

False

1. Engineering design experience can be acquired through:

Observing results of design decisions

Testing prototypes

Studying failures

Completing successful projects

All of these answer choices

1. Engineering encompasses which of the following?

Disposing of resulting systems

Coming up with design solutions

Sustaining solutions across their life cycle

All of these answers choices

1. Ergonomics is

The science of how the body interacts with machines

A method of failure analysis

The study of the monetary value of a product

The way in which a user learns about a device and masters its features

1. Trade-off analysis (i.e., using a decision matrix) is part of which design phase?

Design Generation

Problem Analysis

Design Evaluation

Design Realization

1. A plot of project tasks versus time that graphically depicts the time allotted to each task is the:

Gantt chart

PERT chart

Critical path method

Organizational chart

1. Which of the following best describes an engineer’s main function?

Seeks to apply knowledge

Seeks to expand knowledge

Produces knowledge

Draws general conclusions

1. A correct decision matrix must always use a 0-4 scale:

True

False

1. Which of the following best represents an externally imposed requirement for an espresso machine?

Standard electrical plug

Steam spout

Maximum temperature of 95 degC

Multiple size settings

1. Which of the following is NOT one of the 14 Grand Challenges for the 21st century as identified by the National Academy of Engineering?

Provide fiber-optic power transmission

Reverse-engineer the brain

Develop carbon sequestration

Provide access to clean water

1. A chart used for prioritizing time-critical events, deciding which events can occur concurrently, and identifying slack time is the:

PERT chart

Gantt chart

Organizational chart

Decision matrix

1. Civil engineers often show their designs via modelling and simulation because:

It may not be feasible to build prototype civil engineering structures for testing.

They wish to demonstrate their designing and simulation skills.

It is very easy to model and simulate.

To impress their audience (customers).

1. Brainstorming can only be done in small groups, if it is to be done effectively.

True

False

1. In PERT chart, “PERT” stands for:

Project Evaluation and Review Technique

Program Evaluation and Representation Technique

Project Evaluation and Reproduction Technique

Program Evaluation and Review Technology

1. Determining how to build a machine involves the use of what?

Analysis

Replication

Construction

Design

1. The process of re-creating something that has already been designed is what?

Analysis

Replication

Construction

Design

1. Which of the following would NOT be considered a technical requirement for the blender (simple mechanical system) discussed in class?

12.0 lb weight

56-ounce capacity

Hard anodized aluminum housing

Extremely quiet

0.9 HP motor

1. Which ideas can be thrown out in the conceptual design phase?

Overly complicated ideas

Ridiculous ideas

Expensive ideas

No ideas can be thrown out

1. What is the first stage of the design cycle?

Define overall objectives

Gather information

Model and analyze

Identify and evaluate possible design strategies

1. Which of the following is an idea trigger phase of a formal brainstorming session not intended to do?

Trigger new ideas by hearing ideas of others

Trigger team fighting over who had the idea first

Promote team discussion about ideas

Eliminate ideas from multiple people

1. A good design will:

Meet all technical requirements

Cost more than it should

Works initially, but stops working after a short time

Raises ethical question

1. When gathering information, a good place to look is;

The internet

Magazines

Engineering publications

All of the above

1. After gathering information, the next step is to:

Choose a design strategy

Make a first cut at the design

Model and analyze

Build, document, test