Robotics

❏ **1.** Define the following terms:

a. Robotics

_____

_____

b. Automation

_____

_____

❏ **2.** Briefly describe three examples on how the use of robotics and automation has made an impact on society.

1. _____

2. _____

3. _____

❏ **3.** Briefly describe the following tools:
a. Robotic control systems

_____

_____

b. Motion Control

_____

_____

c. Programmable Logic Controller (PLC)

_____

_____

❏ **4.** Define computer vision. Give three practical examples of its use.

_____

_____

1. _____

2. _____

3. _____

❏ **5.** Describe and give an example of each of the following types of robotic motion.
    a. Rolling

_____

_____

    1. _____

    b. Swimming

_____

_____

    1. _____

    c. Walking

_____

_____

    1. _____

    d. Flying

_____

_____

    1. _____

    e. Climbing

_____

_____

    1. _____

❏ **6.** Describe what is used as a power source for most robotic applications.

_____

_____

❏ **7.** Describe, draw, or show pictures of a ballbot.

_____

_____

_____

_____

❏ **8.** List four advantages and four disadvantages of automation. Briefly describe each.

Advantages

1. _____

2. _____

3. _____

4. _____

Disadvantages

1. _____

2. _____

3. _____

4. _____

❏ **9.** Define and give two practical illustrations on the following types of automation:

a. Home

_____

_____

1. _____

2. _____

b. Auto Manufacturing

_____

_____

1. _____

2. _____

c. Industrial

_____

_____

1. _____

2. _____

d. Mining

_____

_____

    1. _____

    2. _____

e. Retail

_____

_____

    1. _____

    2. _____

❏ **10.** Become familiar with any FAA (or equivalent body) regulations governing the operation of robots (including drones) in your locality.

    Date completed _____

❏ **11.** Discuss with a group the biblical context of the following texts as they relate to the field of automation and robotics:

    a. Genesis 1:27

    b. Psalm 139:14

    c. Proverbs 1:1-7

    d. 1 Corinthians 2:16

    Date completed _____

❏ **12.** List and discuss the relevance of Isaac Asimov's three rules governing robots.

    1. _____

    2. _____

    3. _____

❏ **13.** Research ideas on robotic construction projects. Based on your research, construct and successfully operate a robot from a kit.

    Date completed _____

Robotics, Advanced

❏ **1.** Have the Robotics Honor.

❏ **2.** Define the following terms:

a. Artificial Intelligence

_____

_____

b. Accelerometer Sensor

_____

_____

c. Compass Sensor

_____

_____

d. Infrared Seeker & Receiver

_____

_____

e. Gyroscopic Sensor

_____

_____

f. Ultrasonic Sensor

_____

_____

g. Autonomous Robot

_____

_____

h. Pneumatic

_____

_____

i. Hydraulic

_____

_____

j. Sound Sensor

_____

_____

k. Light Sensor

_____

_____

l. Touch Sensor or similar

_____

_____

m. Servo Motor

_____

_____

n. Color Sensor

_____

_____

o. Operating System

_____

_____

p. Remote Control

_____

_____

q. Gears

_____

_____

r. Torque

_____

_____

❏ **3.** Research an existing Robotics Club or League and discuss the following:

    a. What are the core values of a local robotics league in your region?

    b. How do these core values correspond with being a good Christian?

    Date completed _____

❏ **4.** Using a kit, build a robotic model from instructions. Program your robot to complete one of the following challenges:

    a. Sort at least 3 items of 3 different colors

    b. Sort at least 3 items of 3 different shapes

    c. Sort at least 3 similar items of different sizes

    d. Pick up and move an object from one point to another

    e. Kick, throw, or push an object at a specific target

    f. Navigate an obstacle course or maze

    g. Pick itself up (used for climbing over objects that it is unable to drive over)

    Date completed _____

❏ **5.** Design and build your own robotic model and program your robot to complete one of the following challenges (cannot be the same challenge as completed in previous requirement):

    a. Sort at least 3 items of 3 different colors

    b. Sort at least 3 items of 3 different shapes

    c. Sort at least 3 similar items of different sizes

    d. Pick up and move an object from one point to another

    e. Kick, throw, or push an object at a specific target

    f. Navigate an obstacle course or maze

    g. Pick itself up (used for climbing over objects that it is unable to drive over)

    Date completed _____

❏ **6.** Choose one of the following:

    a. Use your robotic model as a visual aid in a Children's Story for youth ages 2-9 at church or Sabbath School class.

    b. Use your robotic model as part of a school project.

    Date completed _____

❏ **7.** Write a 250 word paragraph, or give a 3-5 minute presentation to your group or club, explaining how you can use Robotics to witness to those that don't know about God.

      Date completed _____

❏ **8.** Review Asimov's governing rules of robots and discuss if creating robots is usurping God's creative prerogative with regard to sentient beings.

      Date completed _____

❏ **9.** Complete one of the following:

    a. Join an existing Robotics Club.

    b. Start a Robotics Club.

    c. Visit a Robotics Club for one of their competitions.

    d. Interview a member of a Robotics Club in person, by phone, email, or internet vía video software.

      Date completed _____