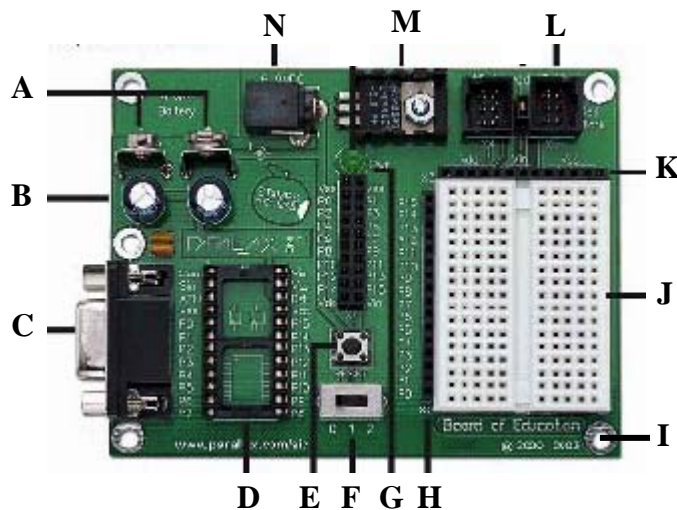


## Homework #10 BASIC Stamp & BOE-BOT Worksheet

The purpose of this assignment is to help the student become familiar with the BASIC Stamp microprocessor, the Board of Education, and the BOE-BOT robot. All of the answers for the assignment can be found using the following resources which are available at the websites listed below or on Paul Gordy's webpage at [www.tcc.edu/faculty/webpages/Pgordy/EGR120/](http://www.tcc.edu/faculty/webpages/Pgordy/EGR120/).

- Robotics with the BOE-BOT Student Guide, Version 2.2
  - Available at [http://www.parallax.com/dl/docs/books/edu/Roboticsv2\\_2.pdf](http://www.parallax.com/dl/docs/books/edu/Roboticsv2_2.pdf)
- BASIC Stamp Manual, Version 2.1
  - available at <http://www.parallax.com/dl/docs/prod/stamps/BasicStampMan.pdf>
- BOEBOT lecture notes
- Parallax web site: [www.parallax.com](http://www.parallax.com)



**Part A: (28 pts) Matching – Place the correct letter (A – N) next to each term below:**

Term	Letter
Serial Port	
Power Indicator Light	
Breadboard	
9V Battery Clip	
5V Regulator	
24-pin socket for BASIC Stamp	
Connection Port for Servos	

Term	Letter
Power Jack for Adapter	
Reset Button	
On/Off Switch	
Header with Connections to P0 – P15	
Header with Connections to Vss, Vdd, and Vin	
Filter Capacitors for 5V Regulator	
Mounting Hole	

**Part B: (40 pts) Multiple Choice – Circle the letter corresponding to the best answer in each part.**

1. Which of the following is NOT a model of the BASIC Stamp?
  - a) BASIC Stamp 2e    b) BASIC Stamp 2    c) BASIC Stamp 2x    d) BASIC Stamp 2p
  - e) BASIC Stamp 1



16. Which of the following is not a sensor?  
 a) infrared detector      b) accelerometer      c) temperature probe      d) servo  
 e) whisker
17. BASIC Stamp programs will typically begin with two statements similar to  
 ‘ {\$STAMP BS2}  
 ‘ {\$PBASIC 2.5}  
 identifying the model of the BASIC Stamp to be used and the version of the editor to be used.  
 These statements are called:  
 a) compiler directives      b) identifiers      c) tokens      d) instructions      e) commands
18. Comments in BASIC Stamp programs begin with what character?  
 a) /      b) //      c) ‘      d) “      e) \*
19. Text messages can be sent by a BASIC Stamp program to the computer screen using which  
 command?  
 a) PRINT      b) COUT      c) LPRINT      d) DISPLAY      e) DEBUG
20. Some of the first simple programs using the BASIC Stamp involve using the BASIC Stamp to turn  
 on and off small device that gives off light called a(an):  
 a) bulb      b) LED      c) LCD      d) CRT      e) resistor

<b>Part C: (32 points) <u>True/False</u> – Circle T (True) or F (False) in each part below.</b>
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- |    |   |   |  |
|----|---|---|--|
| 1. | T | F | Some servos only turn over a certain angular range (such as $-90^\circ$ to $+90^\circ$ ), but the servos in the BOE-BOT have been modified to turn continuously.       |
| 2. | T | F | The BOE-BOT turns by rotating one servo at a faster rate than the other servo.   |
| 3. | T | F | In order for the BOE-BOT to move forward, one servo needs to turn clockwise and the other needs to turn counter clockwise.   |
| 4. | T | F | The BASIC Stamp has 24 I/O pins.   |
| 5. | T | F | When the BASIC Stamp IC is plugged into an IC socket on the Board of Education, care needs to be taken to insure that it is not plugged in upside down.                |
| 6. | T | F | If a 9V battery is used on the Board of Education (BOE), the purpose of the <b>voltage regulator</b> on the BOE is to produce a steady 5V required by the BASIC Stamp. |
| 7. | T | F | LED stands for <b>light emitting device</b> .  |
| 8. | T | F | Once a program is downloaded from the computer into the BASIC Stamp, the serial cable may be disconnected from the Board of Education.                                 |
| 9. | T | F | The BASIC Stamp command <b>LOW I2</b> will set I/O pin P12 to ground (or 0V or $V_{ss}$ ).   |

10. T F The BASIC Stamp command **HI 5** will set I/O pin P5 to 5V (or Vdd).
11. T F The BASIC Stamp is referred to as a **microprocessor** or a **microcontroller**.
12. T F The BASIC Stamp 2 runs at a speed of 20 MHz and can execute about 4000 instructions per second.
13. T F In order to control the brightness of an LED, a **resistor** is connected in series with the LED.
14. T F Programs may be restarted on the BOE-BOT by pressing the Reset button.
15. T F The name **BASIC Stamp** comes from the fact that it is about the size of a postage stamp and it is programmed using a version of BASIC.
16. T F The BOE-BOT can be steered by turning the ball that serves as its front wheel.