

1. TRUE / FALSE QUESTIONS

- _____ Functions make it easier for programmers to work in teams.
- _____ Calling a function and defining a function mean the same thing.
- _____ A flowchart shows the hierarchical relationships between functions in a program.
- _____ IPO charts provide only brief descriptions of a function's input, processing, and output, but do not show the specific steps taken in a function.
- _____ A function in Python can return more than one value.

2. COMPLETION QUESTIONS: Fill in the blanks.

- a) A value-returning function has a(n) _____ statement that sends a value back to the part of the program that called it.
- b) The 'P' in the acronym IPO refers to _____.

3. ALGORITHM WORKBENCH QUESTIONS

- a) The following statement calls a function named `half`, which returns a value that is half that of the argument. (Assume the `number` variable references a float value.)
Write code for the `half` function.
`result = half(number)`
- b) Write a function named `factorial` that receives a positive integer number as a parameter from the caller then returns the factorial to the caller.
Factorial of a positive integer number: $n! = 1 \cdot 2 \cdot 3 \cdot \dots \cdot (n-1) \cdot n$
- c) Write a statement that generates a random number in the range of 1 through 100 and assigns it to a variable named `rand`.

MULTIPLE CHOICE QUESTIONS

4. This standard library function returns a random floating-point number within a specified
- range of values.
 - random
 - randint
 - random_integer
 - uniform
5. This type of function returns either True or False.
- Binary
 - true_false
 - Boolean
 - logical
6. Which of the following will assign a random integer in the range of 1 through 50 to the variable number?
- random(1, 50) = number
 - number = random.randint(1, 50)
 - randint(1, 50) = number
 - number = random.randrange(1, 50)
7. A value-returning function is
- a single statement that performs a specific task
 - called when you want the function to stop
 - a function that will return a value back to the part of the program that called it
 - a function that receives a value when called
8. What will be the output after the following code is executed?
- ```
def main():
 name2 = "Tony"
 name1 = "Gaddis"
 fullname = pass_it(name1, name2)
 print(fullname)
def pass_it(x, y):
 z = x + ", " + y
 return(z)
main() # Calling Main
```
- Tony Gaddis
  - Gaddis Tony
  - Tony, Gaddis
  - Gaddis, Tony
  - Nothing, this code contains a syntax error.

9. What will display after the following code is executed?

```
def main():
 print("The answer is", magic(5))
def magic(num):
 answer = num + 2 * 10
 return answer
main()
```

- a) 70
- b) 25
- c) 100
- d) The statement will cause a syntax error.

10. What will be displayed after the following code is executed?

```
def pass_it(x, y):
 z = x*y
 result = get_result(z)
 return(result)
def get_result(number):
 z = number + 2
 return(z)
num1 = 3
num2 = 4
answer = pass_it(num1, num2)
print(answer)
```

- a) 12
- b) 9
- c) 14
- d) Nothing, this code contains a syntax error.

### **PROGRAMS**

11. Write a program that generates printable addition tests. The tests should consist of 5 questions which present a simple addition question in the following format, where the question number goes from 1 to 5, and num1 and num2 are randomly generated numbers between 1 and 10:

Question 1  
num1 + num2 = \_\_\_\_\_

...

Question 1  
num1 + num2 = \_\_\_\_\_

The program should simply display the 5 questions – it should not prompt the user for any input. No input is received from user numbers are all randomly generated.

12. Write a program that generates a random number in the range of 1 through 100, and asks the user to guess what the number is. If the user's guess is higher than the random number, the program should display "Too high, try again." If the user's guess is lower than the random number, the program should display "Too low, try again." If the user guesses the number, the application should congratulate the user then finish.

**Optional Enhancement:** (Do it later at home) Enhance the game so it keeps count of the number of guesses that the user makes. When the user correctly guesses the random number, the program should display the number of guesses. You may also modify program as giving points as 1<sup>st</sup> guess 100 and each guess points go down -5 and after twenty guess when the points become 0, it says you have failed. Try making this program with different approaches so hopefully you will learn more on programming.

13. One can simulate a coin toss by considering random number as 1 (Heads) and 2 (Tails). Write a program that simulates the tossing of a coin by randomly generating a number in the range of 1 to 2. Your program should toss the coin 1000000 times. Your program will keep track of how many heads and tails came out and print the results in tabular form for every 10000th toss.
14. Write a program by using turtle graphics and random modules. Your program first draws the square of each side 400 pixel and a circle of radius 200 pixels as shown in the figure. Then your program generates randomly 500 points with coordinates  $x$  ( $-200 \leq x \leq 200$ ) and  $y$  ( $-200 \leq y \leq 200$ ) and draw each points as a dot on the figure. If the dots are within the circle then they will red otherwise they will be blue.

