PAKISTAN INSTITUTE OF ENGINEERING AND APPLIED SCIENCES

DEPARTMENT OF PHYSICS AND APPLIED MATHEMATICS

MIDTERM # 1, PAM–533, DATE: 29/07/2021

Questions 1 through 10 carry 1 mark each. Questions 11, 12 and 13 carry 5 marks each.

Question # 1: What is the output of this program?

```
#!/bin/bash
for i in 2 3 7 9
do
echo "Happy Midterm"
done
exit 0
```

1. "Happy Midterm" will print 21 times
2. "Happy Midterm" will print 4 times
3. Program will generate an error message
4. None of the mentioned

Question # 2: What is the output of this program?

```
#!/bin/bash
read x
until [ -e $x ]
do
echo "The file does not exist. Do you want to create? y/n"
read a
if [ $a = y ]; then
touch $x
echo "Your file has been created successfully."
fi
done
echo "The file is present in this directory"
exit 0
```

1. it checks the existance of your entered file in the present working directory
2. it creates the file if file does not exists
3. program runs untill you create the file
4. all of the mentioned

Question # 3: After running this program, if you enter 1000, then what will be the output of the program?

```
#!/bin/bash
echo "Please enter a number"
read a
if [ $a -lt 100 ]; then
echo "It is less than 100";
elif [ $a -lt 1000 ]; then
echo "It is less than 1000"
else
```

echo ”It is greater than 1000”
fi
exit 0

1. It is greater than 1000
2. It is less then 1000
3. It is equal to 1000
4. None of the above mentioned

Question # 4: What is the output of [‘PAM-533!’]*2 on python3 interpreter?

1. [‘PAM – 533!′]*2.0
2. [′PAM – 533′!′PAM – 53′!]
3. [′PAM – 533!′,′ PAM – 533!′]
4. [′PAM – 533!′]*2

Question # 5: Which of the following will be printed? x,y=17.0,8; x//y

1. 2.0
2. 2.125
3. 125
4. SyntaxError: invalid syntax

Question # 6: Which command cannot be called directly by an anonymous function?

1. scan
2. def
3. exit
4. print

Question # 7: What will be the output of: >>> ‘python3!’[3:]

1. ‘hon3!’
2. hon3!
3. 3!
4. SyntaxError: invalid syntax

Question # 8: Which of the following functions will be used to shuffle a list?

1. list.shuffle()
2. shuffle.list()
3. random.shuffle(list)
4. shuffle(list)

Question # 9: What will be the output of: >>> list=[1,2,3,4,5]; list[-1]

1. ‘5’

2. 5
3. $[1, 2, 3, 4, 5, -1]$
4. SyntaxError: invalid syntax

Question # 10: What will be the output of: >>> list=[1,2,3,4,5]; del list[3]; list

1. $[1, 2, 4, 5]$
2. $[1, 2, 3, 5]$
3. $[4, 5]$
4. SyntaxError: invalid syntax

Question # 11: Using Newton's method, develop a compact program that takes integers n and k as command-line arguments and writes the k^{th} root of n.

Question #12: Taylor's expansion to exponential function is: $e^x = 1 + x + \frac{x^2}{2!} + + \frac{x^3}{3!} + ... + \frac{x^n}{n!}$. Take x as float and n as integer as two arguments to your python code to sum this finite series. You must define a recursive function to evaluate each term of the Taylor's series.

Write down the iteration table for your code for $x = 1$ and $n = 5$.

How many times did your code call the user defined function in total for $x = 1$ and $n = 5$?

What is the default value of maximum recursion depth in python3?

Question # 13: Try to describe what this piece of code is estimating:

```
import sys
import math
import random
n = int(sys.argv[1])
W1 = 0
W2 = 0
for i in range(n):
    for j in range(0,6):
        if random.randint(1,6) == 6:
            W1 += 1
            break
    TWO = 0
    for k in range(0,12):
        if random.randint(1,6) == 6:
            TWO += 1
            if TWO == 2:
                W2 += 1
                break
print(W1/n, W2/n)
print(W1, W2, n)
```

BREATHE ... HAPPY CODING ☺