

COURSE CODE (CREDITS): 18B11CI315 (03)

MAX. MARKS: 15

COURSE NAME: Python Programming with Raspberry Pi

COURSE INSTRUCTORS: Dr. Vikas Baghel

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1. a) What are the outputs of the following codes snippets? [1.5] [CO2]

i.

```
>>> x = 100
>>> print('x:', x, 'x squared:', x*x, 'sqrt(x):', x**0.5)
```

ii.

```
>>> z = [x+y for x in [10,20,30] for y in [1,2,3]]
>>> print(z)
```

iii.

```
>>> phrase = 'My name is Vikas Baghel'
>>> word_list = phrase.split()
>>> print(word_list)
```

b) Write the line(s) of code that will emit the given Output. [1]

i.

```
>>> a_list = [3, 5, 6]
>>> YOUR CODE HERE
3
```

ii.

```
>>> a_list = [3, 5, 6]
>>> YOUR CODE HERE
3
5
6
```

c) Consider the following code: [2.5]

```
class Spell:
def __init__(self, incantation, name):
self.name = name
self.incantation = incantation
```

```

def __str__(self):
    return self.name + ' ' + self.incantation + '\n' + self.get_description()

def get_description(self):
    return 'No description'

def execute(self):
    print(self.incantation)

class Accio(Spell):
    def __init__(self):
        Spell.__init__(self, 'Accio', 'Summoning Charm')

class Confundo(Spell):
    def __init__(self):
        Spell.__init__(self, 'Confundo', 'Confundus Charm')

def get_description(self):
    return 'Causes the victim to become confused and befuddled.'

def study_spell(spell):
    print(spell)

spell = Accio()
spell.execute()
study_spell(spell)
study_spell(Confundo())

```

- i. What are the parent and child classes here?
- ii. What does the code print out?
- iii. What do we need to do so that 'print(Accio())' will print the appropriate description ('This charm summons an object to the caster, potentially over a significant distance')? Write down the code that we need to add and/or change.

- Q2. a) A clerk works in a store where the cost of each item is a positive integer number of rupees. So, for example, something might cost ₹21, but nothing costs ₹9.99. In order to make change a clerk has an unbounded number of bills in each of the following denominations: ₹1, ₹2, ₹5, ₹10, and ₹20. Write a program (code) that takes two arguments, the cost of an item and the amount paid, and prints how to make change using the smallest possible number of bills. [3] [CO2]
- b) Write a Python program to toggle the state of an LED connected to "GPIO17" on a Raspberry Pi, causing it to blink for 1 second in the on state and 1 second in the off state in a continuous loop? [2]
- Q3. a) What is the Raspberry Pi, and what are its primary applications in the world of computing and electronics? [2] [CO1]
- b) Write an exhaustive overview of the Raspberry Pi GPIO pin layout, detailing the number of pins, their physical location on the board, and their functions? [3]